AMATEUR RADIO

JANUARY 1991

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THE WIA RADIO AMATEUR'S JOURNAL

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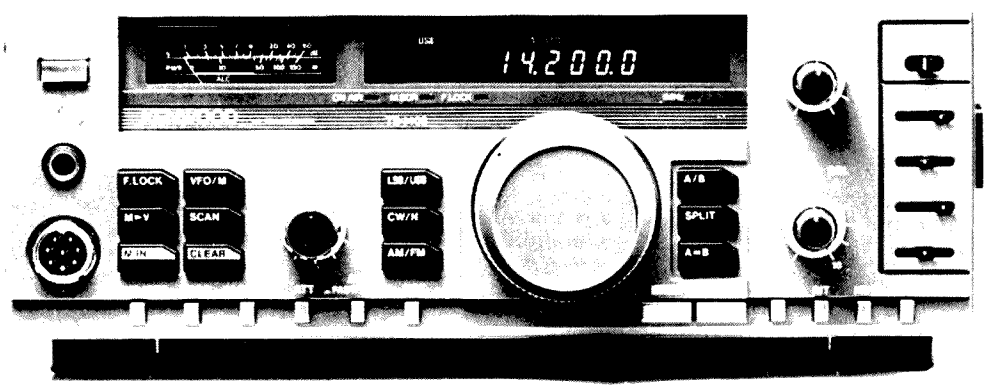

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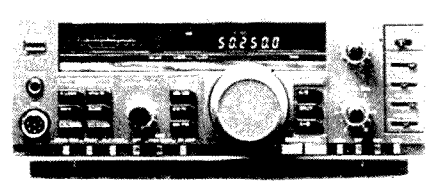

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

NEWS EDITOR
Jim Linton VK3PC

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Evan Jarman VK3ANI
Peter O'Connor VK4KIP
Gil Sones VK3AUI
Phil Steen VK4APA
Roy Watkins VK6XV

DRAFTING
Vicki Griffin VK3BNK

MARKETING
Bruce Kendall VK3WL
Norm Eyres VK3ZEP

ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161

Telephone: (03) 528 5962
(03) 523 8191
Fax: (03) 523 8191
(Non dedicated line)
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Cover

This month we depict the WRANS Memorial Window, located in the Garden Island Chapel, Sydney. We thank the following for permission to reproduce the photo: Celtic Studios Sydney – the designers of the window, the 1988 Ex-WRANS Reunion Committee – holders of the copyright, and Bartels Postcards and Souvenirs – publishers of the postcard from which our reproduction was made. See "The Story of a Window" on page 13.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Start of the Decade — Clearing the Air

Looking back through my records, I see that last year's January editorial was entitled "End of the Decade". Perhaps it would have been better to call it the "Start of the Nineties", but now there is no doubt that we are in the new decade, and its first year has hardly been an unqualified success! Financial gloom, business doom, and even the threat of war. Economics, politics and religion have combined to form a world scene with few bright spots. Perhaps the self-funded, apolitical, non-religious international brother- (and sister) -hood of amateur radio can play some part in restoring the world to relative harmony, prosperity and peace. Some of us may be in a position to have some effect; most of us, I fear, are merely pawns in an incredibly complex game.

Let us return to our own little domestic scene. Last night, at the December meeting of the Publications Committee, there was even more discussion than usual about whether we are keeping AR up to the standard and style you all want; can we improve, and where and how? The very first question, though, was what was the state of affairs with the material already on hand? This is a regular part of the meeting routine, but even so, it appeared that several items had sunk without trace! After a frantic search at home (where most editorial work is done) the missing items were found today. It is incredible how well a few typed pages (let alone handwritten notes) can hide themselves in a stack of material 15 or 20 centimetres high!

As a result of all this it seemed a good idea to try to clear the air as a New Year effort. Some of you may have submitted items which were not published. Why? Or, after initial acknowledgement, you heard no more. Why? Your original wording may have been modified here and there, "pruned" in length, or words added. Why? You have a favourite subject, but we never seem to publish anything about it. Why? You wrote to "Over to You" and your letter was altered considerably. You tried again, and it came back to you with a request to reduce it to 200 words. Why?

Most of these questions can be answered by three statements. We can publish only what we receive. We could use more technical articles. We tend to have more than enough general-interest material.

To expand a little on these: we have very limited space, so the general-interest items, to be fair to their authors, can only be published in order of receipt. Sometimes this means that by the time its turn comes up an article is no longer topical; the best part of a year may have passed and it's almost time for next year's contest or birthday or whatever. It's too late! Sorry, folks!

Old Chinese proverb: A genius can say in 100 words what anyone else can say in 1000! We know we are not geniuses, literary or otherwise. Neither, we submit, are most of you! He who objects most strongly to changing his wording, probably needs it most. And, frequently, to fit the available space, an article may need to lose 200 or 300 words at one hour's notice. Otherwise, it won't go!

Finally, your favourite technical topic. No one writes about it. Perhaps you could. Why not give it a go? Typed if possible, but hand printing acceptable. NOT ALL UPPER CASE! Okay? See it soon? **ar**

WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Market System for Radio Spectrum

A Media Statement from the Department of Transport and Communications (DoTC) on 14th October 1990 announced the release of a report *"Management of the Radio Frequency Spectrum: an Economic Analysis"* prepared by the Bureau of Transport and Communications Economics (BTCE). The report proposes a *"more commercially based approach to spectrum management"*. Basically, what that means is auctioning of currently unused spectrum, and open trading and leasing of spectrum access rights, with the costs being determined by the demand for the specific spectrum area.

According to the news release there would be an overriding legal framework to regulate the trading and resolve conflict, as well as to monitor the needs of users providing *"public and merit goods"*.

The report is to be submitted to the current House of Representatives Committee of Enquiry into the management of the radio frequency spectrum. Copies of the report are available at Commonwealth Government bookshops in capital cities.

The WIA, representing the amateur service in Australia, will be considering the report and responding to it in further submissions to the Committee of Enquiry.

International Frequency List on Disk

A press release from the International Telecommunications Union (ITU) on 15th October 1990 advises that the International Frequency List is now available on CD-ROM (compact disc - read only memory). This list was first published in 1928, when it contained information on the 1700 frequencies then in use. In 1985, when the number of frequencies had reached 1,100,000, the format was changed from paper to microfiche.

The compact disc is one further step towards making the publication more flexible and useful. The information supplied can be accessed by frequency, country, notifying administration, area, region or class of station. Subscribers receive either one or two updates per year.

Advance Notice of AR Special Issue

In line with WIA policy of producing several *"special"* issues of Amateur Radio magazine each year, the Publications Committee has decided that the May 1991 issue will concentrate on *"Advanced Modes"*.

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Tim Mills David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2ZTM VK2KFU	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Eddie Fisher Eric Fittock	VK4AOK VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Alyn Maschette John Faman Bruce Hedland - Thomas	VK6KWN VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: **All times are local. All frequencies MHz.**

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

Remember Section 14 of the AOCP Syllabus? It includes high definition television, slow scan television, radio teletype, repeaters, satellite translators and transponders, beacons, bandwidth compression techniques, and computer controlled communication systems. Any of these are fair game for the May *"special"* issue, so if you have been thinking about preparing an article or comment relating to any of these modes, now is the time to do so. Remember that all the Publications Committee members are volunteers, so it may take a few months for an article to be processed. Drafting of diagrams also takes time, so allow for this and start on your contribution now.

Ross Hull Contest

Have you pencilled in this important VHF-UHF contest on your diary? The 1990 - 1991 contest runs from 22nd December 1990 until January 19th 1991, but even if you missed the start of the contest it is not too late, as the score is calculated on the entrant's best seven days, which need not be consecutive.

The complete revised rules were published in the November 1990 issue of "Amateur Radio" magazine on page 32. Important changes this year include basing the scoring on both distance and frequency, and the introduction of separate sections for terrestrial and satellite contacts.

Why not take advantage of the summer propagation conditions and the extra activity on VHF/UHF during this contest. And don't forget to submit your log in good time.

Mongolian Radio Sports Federation

The International Amateur Radio Union (IARU) advises that the Mongolian Radio Sports Federation has applied for IARU membership. MRSF reports that there are about 1300 radio sportsmen in Mongolia, 39 radio amateurs with callsigns, and 117 amateur listeners.

Region 1 of the IARU has supported the application, advising that they are satisfied that MRSF is a desirable member, and is the logical representative of amateur radio in Mongolia.

It now remains for the IARU member societies to vote on the proposal that MRSA be admitted to IARU membership. The WIA registered its "YES" vote at the end of November 1990.

Radio Amateur Growth Vital

As radio amateur societies around the world strive to gain the support needed from their respective administrations in preparation for WARC 92, the growth of the amateur and amateur-satellite services is going to be a key factor.

Worldwide, the number of radio amateurs is growing at the rate of 7% per year and is expected to exceed four million by the end of the century. This growth supports the amateur service claim for more spectrum space from the International Telecommunications Union (ITU) at WARC 92. It is no exaggeration to say that for the amateur service to stay healthy it is essential for it to continue to grow.

1,000,000 Amateurs in Japan

The Japanese Amateur Radio League (JARL) recently advised that the number of amateur radio stations licensed in Japan stood at 1,027,101. This is about half of the world's total of radio amateurs.

The country with the next largest radio amateur population is the United States with 494,114 licensed stations, about a quarter of the world's total.

In comparison, the latest Australian DoTC statistics show an Australian amateur station total of 18,655 (excluding repeaters and beacons) which is less than 1 per cent of the world's total.

CW for the Disabled

Those people ready to write off the use of Morse code as obsolete will be interested to learn of a recently developed system in the USA which allows people, unable to speak or use their limbs, to send CW to a computer by using side-to-side head movements which close switches. This CW input to the computer displays type on the screen, produces printouts, and can activate a voice synthesiser.

Computer technology developments are playing a very important part in bringing amateur radio to disabled persons.

Membership Renewals

Have a look at the address label you received with your last issue of Amateur Radio magazine. If the first two digits on the top line of information on that address label are "01", then you will be one of the 4600 WIA members due to renew your membership as from 1st January 1991.

These renewal notices were sent out in the post in the first week of December 1990. Please note that unless your renewal is received at the Executive office by Friday 18th January, you will not receive the February *"reference"* issue of Amateur Radio magazine.

In most WIA Divisions the increase in the membership subscription rate has been kept well below the current inflation rate. This has been made possible, in part, by increased efficiency and cost cutting achieved in the Executive Office over the last year. Your prompt forwarding of your membership renewals will help to maintain this efficiency.

Membership renewal time is also an opportune time to add an extra contribution to the WARC 92 Fighting Fund to help defend our hard won amateur service frequencies.

Amateur Radio 20 Year Index

The WIA has previously notified members of the availability of this index either in hard copy or on 5 1/4 or 3 1/2 inch computer disk. The index is continually being extended as each month's content is added in.

This is a very simple way to track down the technical article you remember reading but cannot remember when. Copies can be obtained from the Executive Office for a cost of $5.00 for hard copy or $10.00 on an IBM format floppy disk.

When ordering the computer disk version, please state whether you require it in the dBase III Plus .DBF file format, or in an ASCII format, and the size of the disk required.

Advertising in Amateur Radio

A check of three years of back issues of Amateur Radio magazine reveals that over 50 firms and individuals have placed commercial advertising in our magazine, some on an on-going basis, others as a once-off effort.

Currently, Amateur Radio has a few *"regulars"* and not too often a new advertiser coming in. Advertising revenue can help the WIA by offsetting the cost of the magazine production, and benefits the members by alerting them to the availability of equipment and new products.

However, the advertisers expect to gain from their advertisements, too. So let them know when you deal with them if their advertisements in Amateur Radio magazine have influenced you. And if you, your employer or other associate, can be persuaded to contract for some advertising, the WIA will be very pleased to co-operate.

1991 Radio Amateur Call Book

This is a reminder that the fast selling 1991 Call Book is now available at your Divi-

sional Bookshop. As well as the complete Australian call-sign listings, it includes band-plans, VHF-UHF records, beacon and repeater lists (both VK and ZL), the DXCC list, commercial Television frequencies, TV Carrier frequencies, and information from DoTC.

The recommended cover price is $11.00, but members can purchase their copy from their Divisional Bookshop for $9.50 plus packing and postage if applicable.

Supplies are expected to run out early in the new year, so it is recommended you place an early order for your copy.

Incidentally, the Executive office often receives requests for the Call Book on computer disk. That would be a great idea but, under the commercial contract the WIA has with the Australian government to publish the Call Book, the copyright conditions prohibit such a version of the Call Book.

Amateur Radio in Space

The amateur radio space program has long been an international activity with radio amateurs from many countries contributing to the design and construction of amateur satellites.

But did you realise that in 1990 alone there were two British, two American, one Brazilian, one Argentine and one Japanese amateur satellites launched?

ATV Repeater Closed Down

The Townsville Amateur Radio Club ATV repeater, VK4RAT, is the first amateur television repeater to have to cease operation on the 576 MHz band because of the Regional TV Aggregation scheme. VK4RAT ceased transmissions as from 30th November 1990, and the new commercial TV station in Townsville commenced transmissions early in December.

WARC 92

At the Executive meeting on 20th November, David Wardlaw, VK3ADW, the WIA WARC Co-ordinator, reported on recent developments in the preparation for WARC 92.

The main points of David's report were:

* Low Earth Orbit satellites are seeking up to 5 MHz of frequency below 1 GHz - in fact the USA draft proposal indicates the FCC is looking at allocations on either side of the 144 MHZ band.
* Wind profile radars in the Meteorological Aids band may have to be moved, possibly into the 70 cm band, to avoid interference to search and rescue satellites.
* The IARU report to the Joint Interim Working Party endorses the move of HF Broadcasting stations to SSB.
* The FCC in USA has proposed a world-wide amateur band - 6900 to 7200 kHz - to enable HF broadcasting to fit in within Region 2 and still not disadvantage the amateur service.
* The FCC has also proposed the use of 2390 to 2450 MHz for Satellite Sound Broadcasting, and 420 to 421 MHz as a mobile satellite band limited to low earth orbit satellites.

This World Administrative Radio Conference is going to raise a vast number of issues of direct concern to the amateur service. The WIA is very lucky to have an experienced, dedicated group working on behalf of all Australian amateurs.

Amateur Radio Awards

As members of the WIA know, Amateur Radio magazine is a magazine of the members for the members of the organisation which represents the Australian amateur service both nationally and internationally.

Quite a few of the interesting and original articles which

appear in Amateur Radio are republished in overseas publications. But being published in Australia, and possibly overseas, is not the only accolade for which authors of articles submitted to Amateur Radio magazine become eligible.

Each year the WIA Publications Committee selects winners of the three annual magazine awards. With the wide range of quality articles which appeared in our magazine during the 12 issues published during 1990, the task of the Publications Committee was not an easy one.

However, after much deliberation, the following winners were selected for 1990.

The **Al Shawsmith Journalistic Award**, presented for the article on a radio theme considered best to display literary merit, was awarded to Philip Greentree VK2IW. The winning article *"Newcastle Earthquake Disaster"* appeared in the June issue of Amateur Radio, commencing on page 22. Philip receives an engraved wall plaque as well as a cheque for $100.00.

The **Technical Award**, for the best technical article published during the year, was awarded to Drew Diamond VK3XU for his article *"Super-het-DC Receiver for 3.5 to 4.0 MHz"* which was published in the May issue of Amateur Radio, commencing on page 8. Drew receives a cheque for $100.00.

The **Higginbotham Award**, for meritorious service to amateur radio generally, was awarded to Lloyd Butler VK5BR for the *"continuing technical excellence in his contributions to Amateur Radio magazine"*. Lloyd, who had a total of 12 articles published in Amateur Radio during 1990, also receives a cheque for $100.00.

The Amateur Image

An article which appeared in the IARU publication, "WARC Countdown, Issue No 3", is well worthy of republishing, and should be read by all amateurs.

"As WARC 92 approaches, the public image of Amateur Radio becomes ever more important. We must do everything possible to convince our respective administrations, and ultimately the general public, that we deserve their support at WARC 92. Accordingly, we must insure that our on-the-air behaviour and performance are totally professional and that our commitment to the ideals of the amateur fraternity is reflected in everything we do.

In 1928, Paul M. Segal, W9EEA, wrote an "Amateurs Code" that has guided radio amateurs for more than 60 years. It has been updated several times but has always retained the essential character of Segal's original. Recently, the New Zealand Association of Radio Transmitters (NZART) developed a version of the "Amateur's Code" that applies to radio amateurs world-wide.

With due credit to NZART, the IARU Administrative Council invites and encourages member-societies throughout the world to adopt the "Amateur's Code" as their own. The Council is convinced that by following the code, individual amateurs will enhance the amateur image and, ultimately, our chances of success at WARC 92.

The Amateur's Code

The Radio Amateur is:

CONSIDERATE ...never knowingly operates in such a way as to lessen the pleasure of others.

LOYAL ...offers loyalty, encouragement and support to other amateurs, local clubs, and the national member-society of the International Amateur Radio Union, through which Amateur Radio is represented to government and internationally.

PROGRESSIVE ...with knowledge abreast of science, a well built and efficient station and operation above reproach.

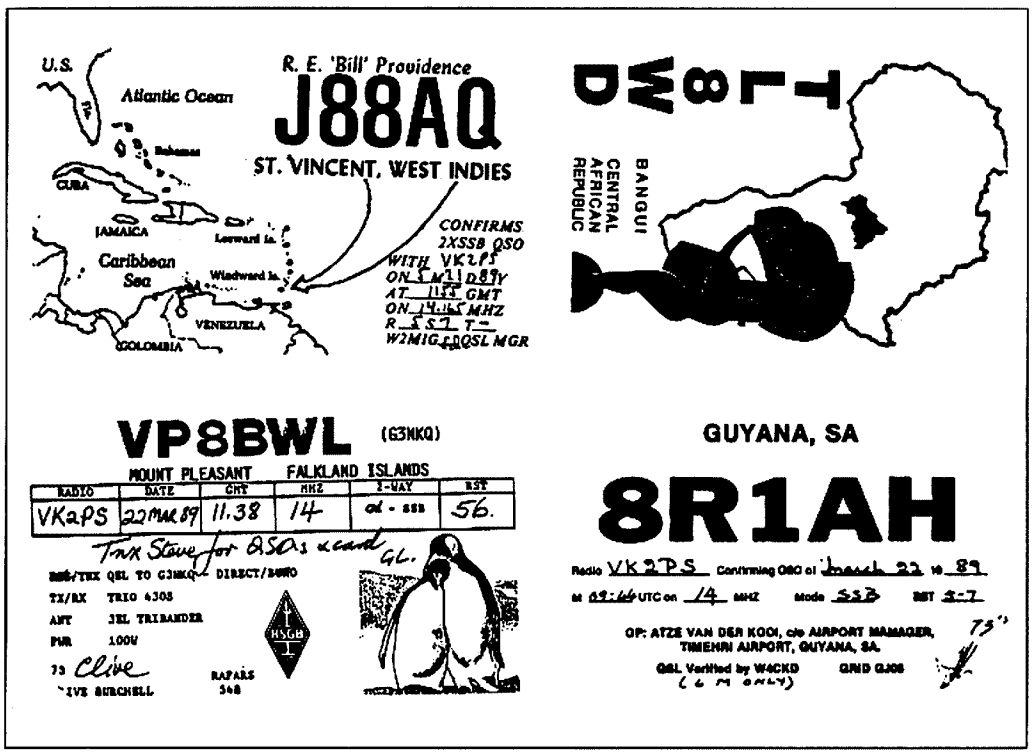
FRIENDLY ...slow and patient sending when requested; friendly advice and counsel to the beginner; kindly assistance, co-operation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

BALANCED ...radio is an avocation, never interfering with duties owed to family, job, school, or community.

PATRIOTIC ...station and skill always ready for service to country and community."

Do you follow "The Amateur's Code"?

BILL BOPER VK3ARZ



From the collection of Stephen Pall VK2PS

ISLANDS ON THE AIR <> SPECIAL EVENT STATION

WF1N

The island of Martha's Vineyard (IOTA, NA-46) will be on the air April 12-15, 1991. The team, led by Tony Spino - WF1N – will operate SSB in the General portions of the 10, 15, 20, 40 and 75 metre bands. RTTY operation is also planned. The island is Dukes County, Massachusetts for County Hunters. QSL's go to WF1N direct , 91 Callbook (KA1HBV in older Callbooks) or via the Buro.

Other members of the team are Rich, NT1RT; Sam, K1SCN; and Lou, KA1DIG.

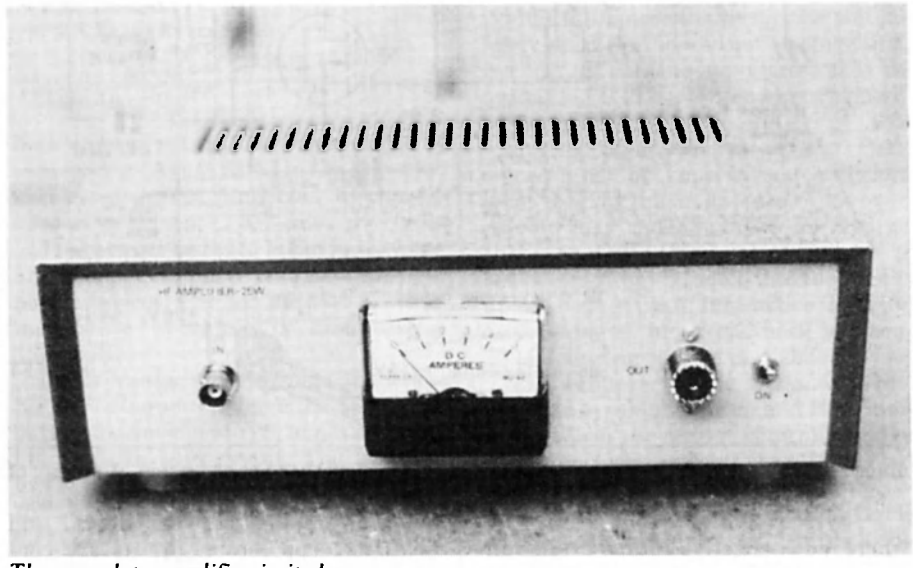
25W Mosfet Linear Amplifier

DREW DIAMOND VK3XU
'NAR MEIAN' GATTERS RD
WONGA PARK 3115

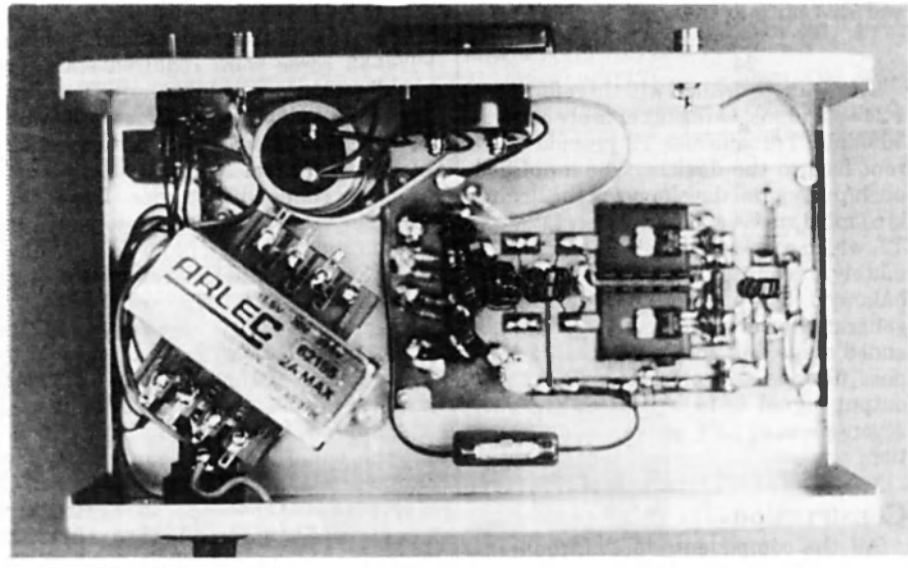
MANY OF US HAVE enjoyed working stations from near and far with a QRP transmitter of perhaps two or three watts output power. There are occasions though, when more power is required to provide nearer 100 per cent readability at the far end. The usual solution, of course, is to boost the output power with a linear amplifier.

For a few years now, amateurs and experimenters have been successfully using power MOSFET devices (primarily intended by their makers for switched-mode power supply work) as very cheap and robust power amplifiers to about 14MHz, and even 30MHz in some applications.

This amplifier was empirically designed around a pair of Motorola MTP4N08 80volt/4amp devices priced at $1 each from a local supplier.



The complete amplifier in its box



Interior view of the amplifier

Performance

Frequency Range:	1.8 to 7MHz, usable to 14MHz.
Output Power:	Nominally 25W, typically 30W PEP or CW.
Input Power:	Nominally 1W.
Power Gain:	about 14dB.
Input SWR:	Less than 1.2.
Two-tone IMD Products:	In the order of -35dB.
Harmonics:	-50dB (depends on LPF).
Output Protection:	Will withstand any load SWR, including short and open at full drive without damage.
Supply:	Nominally 25V at up to 2A (reduced output at 13.8V).

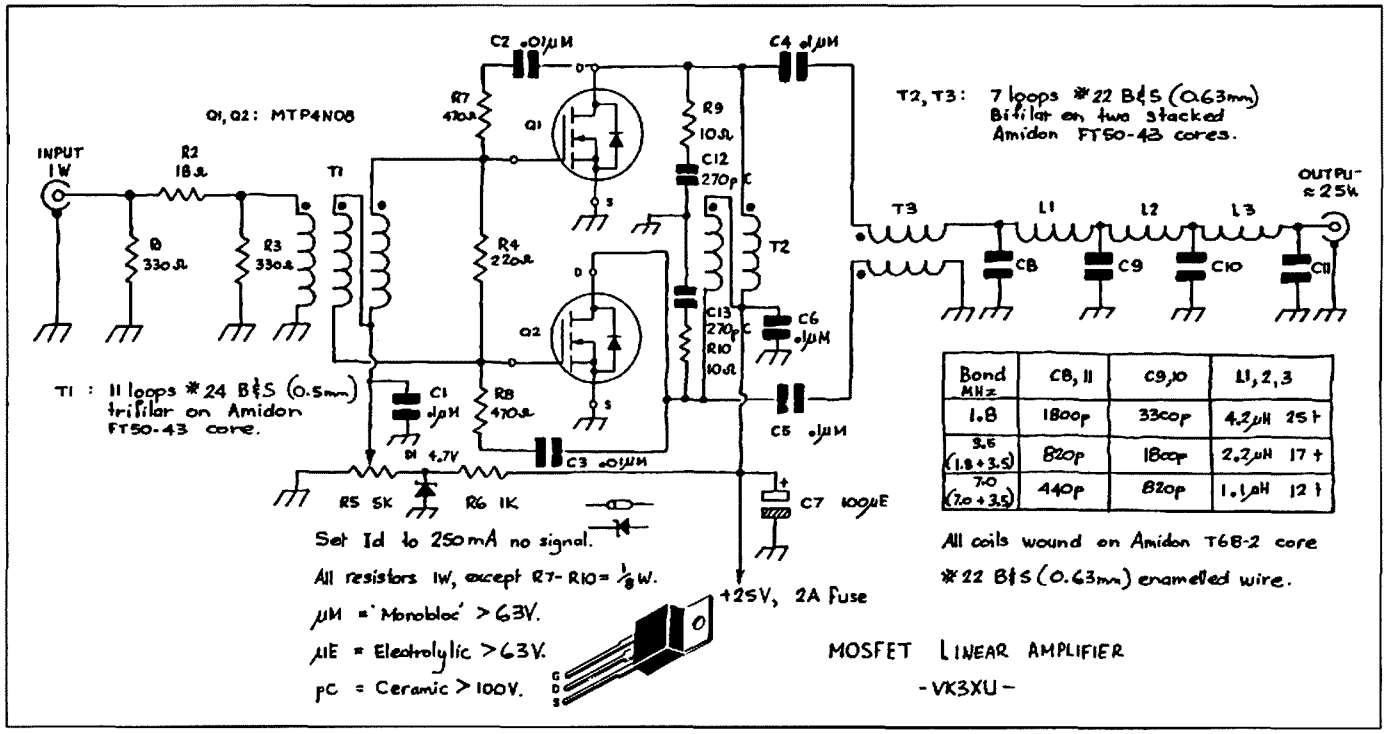
Circuit

The input impedance looking into the primary of T1 is rather reactive, due to the 300pF input capacitance of each device gate. The overall gain of the amplifier is such that we can afford to employ a 3dB loss pad to 'normalise' the input at something closer to the required 50 ohms, and so keep the input SWR below 1.2.

Broadband transformer T1, terminated by R4, provides push-pull drive to the two gates. The 220 ohm termination improves the input SWR and loads the gates such that the amplifier is very reluctant to 'take off'. Further stabilisation is achieved with CR networks C2-R7 and C3-R8 connected between drain and gate of each device. Any tendency to common mode 'latch-up' type oscillation is suppressed by networks R9-C12 and R10-C13.

The result is an amplifier which is extremely tolerant of load mis-match.

By moving to a higher supply voltage, not only is the current required kept to a reasonable value (2A at full output), but the need for elaborate impedance-matching networks is avoided in this instance. The output Z of one device may be esti-



Band MHz	C8, 11	C9,10	L1,2,3
1.8	1800p	330p	4.2μH 25 t
3.5 (1.8+3.5)	820p	1800p	2.2μH 17 t
7.0 (7.0+3.5)	440p	820p	1.1μH 12 t

mated by:

$$Z = \frac{Vd^2}{2Po} = 24 \text{ ohms}$$

where Vd = effective source-drain voltage, and Po = expected output power. Assuming an effective voltage of 24V, and 12W output, then

$$Z = \frac{24^2}{24} = 24 \text{ ohms}$$

The drain to drain Z will therefore be 2 x 24 = 48 ohms, being acceptably close to 50 ohms. Transformer T2 provides current feed to the devices. The amplified push/pull signal developed at the drains is coupled via C4 and C5 into 'sortabalun' T3, which converts the 50 ohm (approximately) balanced output to 50 ohm unbalanced. A push/pull configuration generates fewer harmonics than a single-ended stage, but the inclusion of a low-pass filter is still obligatory if a clean output signal is to be put to air. The seven-element LPF provides this function.

Construction

All the components of the amplifier and one LPF are accommodated upon a double-sided circuit board. The un-etched side provides a continuous 'ground plane' under the active component area as an aid to circuit stability. No holes are required for component leads, but rather are soldered directly onto the copper pads 'VHF fashion' as shown.

The Mosfets must each be fitted with a heatsink. Type 6030 sinks will fit on the space provided. Additional dissipation capacity is obtained by attaching the PWB directly to the chassis. A smear of heatsink compound or petroleum jelly must be applied between device and heatsink. The Mosfet drains are connected to the mounting tag, so don't forget to fit insulated washers under the heat of each screw.

It was found that two stacked Amidon FT50-43 cores were required each for broadband transformers T2 and T3, which are made as follows: Take two 300mm lengths of #22 B&S (0.63mm) enamelled wire. Twist them together at one end, which is clamped in a vice. Draw the wires together and fix the joined free ends in the chuck of a hand drill. Whilst maintaining tautness on the pair, turn the drill until you have about three twists per centimetre. Pull the drill to set the twist, then remove the pair. Carefully wind on about seven loops, leaving about 2cm free at each end. Remove about 1cm of enamel from each wire. For T2, identify the 'windings' with your multimeter on ohms. Connect the end of one to the start of the other to form the centre tap. The starts are shown schematically with a dot.

The output signal is propagated along the pair for T3, and no connection sorting out is required for this one.

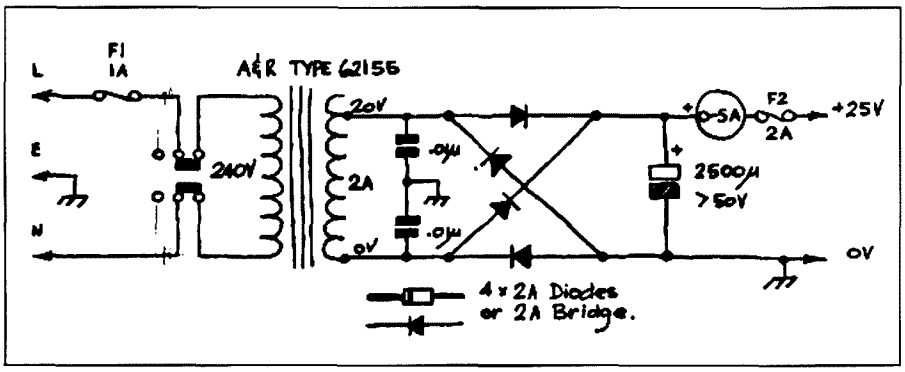
T1 could be a bit tricky. Take three 300mm lengths of #24 B&S (0.5mm) enamelled wire. Twist the triplet up as previously described, making sure there are no bumps or transpositions. Carefully wind about 11 loops onto an FT50-43 core. Identify one winding for the primary, and push this pair out of the way. Now treat the remaining windings as for T2.

Because the push/pull configuration produces fewer even harmonics, the LPF filter demands are relaxed somewhat, and it is possible, if desired, to use just one filter to cover two bands. For example, if it is required to work on the 3.5 and 7MHz bands, then a filter which passes 7MHz and below may be employed. In this instance, the 7MHz harmonic of a 3.5MHz signal will be about -45dB, which in most circumstances would be satisfactory. A 3.5MHz LPF would pass 1.8 and 3.5MHz. Harmonics will be at least -50dB with a 'dedicated' filter.

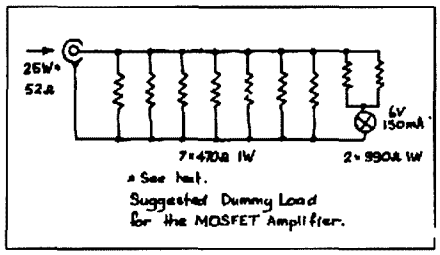
Silver mica or polystyrene capacitors should be used in the LPF, as ordinary disc ceramics are rather lossy and not suited to filter applications. If more than two consecutive bands of operation are required, the LPF for the highest band may be located upon the amplifier board permanently in circuit, and any other filters on an additional board or tagstrip. The form this takes must be left to the builder. Connections between the amplifier, switch and output connector should be made with miniature 50 ohm coax cable.

Bias zener D1, type BZY88C4V7 (4.7V/400mW) should be positioned against one of the heatsinks in order to provide a degree of thermal tracking (and hence bias stabilisation) as temperatures rise. A small blob of heatsink compound may be applied here to assist transfer.

The choice of mains transformer was dictated by standard stock availability.



Suggested Power Supply for the 25W Mosfet Linear Amplifier



The cheapest approach appears to be an Arlec type 62155 with a bridge connected to the 20V tap. Also available from Dick Smith and Jaycar is an 18V/2.2A, which would also suit. Whatever the power supply configuration, you will need about 25Vdc at up to 2A, fairly 'stiffly' regulated. Incidentally, the amplifier will still deliver about 15W output from a nominal 13.8Vdc supply. However, two-tone IMD products will be only about -30dB down (IMD improves in proportion to supply voltage).

To prevent accidental contact, all mains wiring MUST be covered. In addition, both line and neutral conductors must be switched, a 1A fuse fitted in the line side, and mains earth connected to chassis ground as shown.

There must be some holes in the case or box to permit convection cooling of the power devices. The box shown is a K&W measuring 255mmW x 150mmD x 180mmH.

Other Mosfet types, such as the popular IRF510 and 511 have the same pinouts as for the MTP4N08, and will probably work in this circuit. The 510 has lower input and output capacitance for the same voltage and current rating, and should therefore yield a better HF response. References, 4, 5 and 6 have details on low-pass filters for the higher bands.

Testing

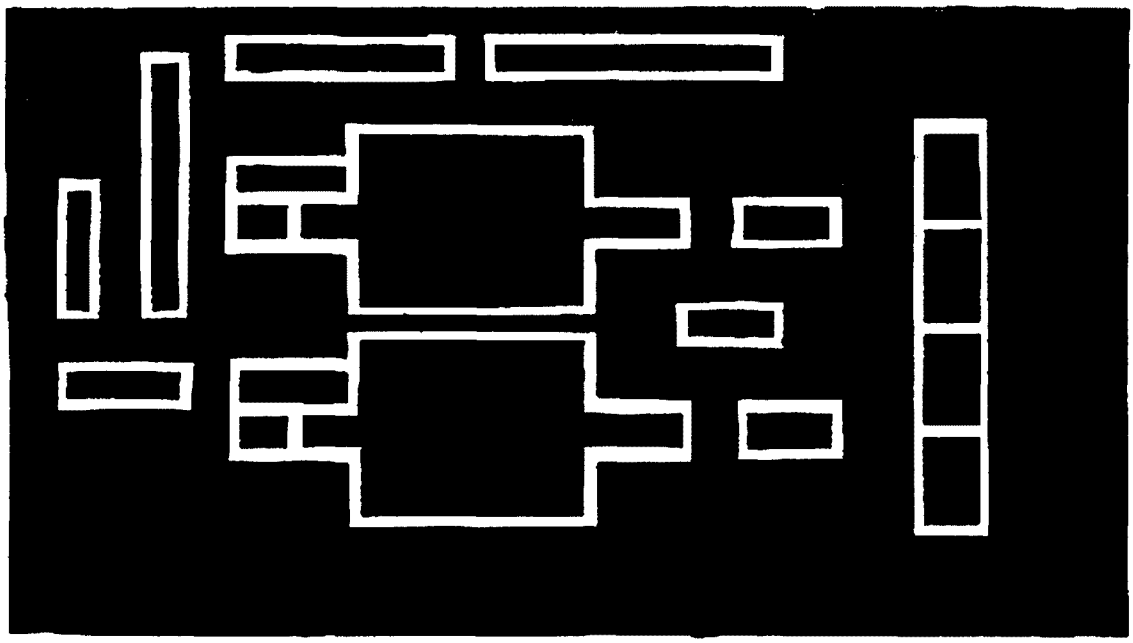
Verify that all components are properly located, and that polarities are correct where appropriate. Remove fuse F2, and apply power. Check for about 28V (or 1.4 times your secondary voltage) across C13. Set R7 to minimum (CCW). Install fuse F2 and adjust R7 for a quiescent no-signal current (Idq) of about 200mA.

Terminate the output with a 50 ohm dummy load/power meter of adequate capacity (see below). Connect a CW driving source (eg QRP TX of about 1W) to the input. About 25 to 30W should be indicated on the power meter, or the lamp brightly lit. After some minutes operation at full power the heatsinks will get fairly warm, but should not become 'stinking hot'. If continuous operation is required (eg RTTY), larger heatsinks will be required.

During on-air operation, the input signal must be kept at just sufficient level to give linear operation, as overdriving may cause splatter on SSB, or clicks on CW. After some minutes of operation, it may be noted that Idq sneaks up to about 300mA. In practice it should be found that Idq drops back to about 200mA during receive periods.

The ammeter in the DC supply line provides a valuable drive and tune indicator. When the output is terminated in a 50 ohm resistive load, it will be noted that Id rises in direct proportion to CW input drive up to about 2A, then levels off. Any further drive only pushes the amplifier into the non-linear region. An unprocessed SSB signal should flick the ammeter up near 2A on voice peaks, but the average level should be only about 1A.

If an oscilloscope is available, check the SSB waveform and confirm that no flat-topping (and hence splatter) is occurring.



PWB Layout for Mosfet Linear Amplifier

Dummy Load

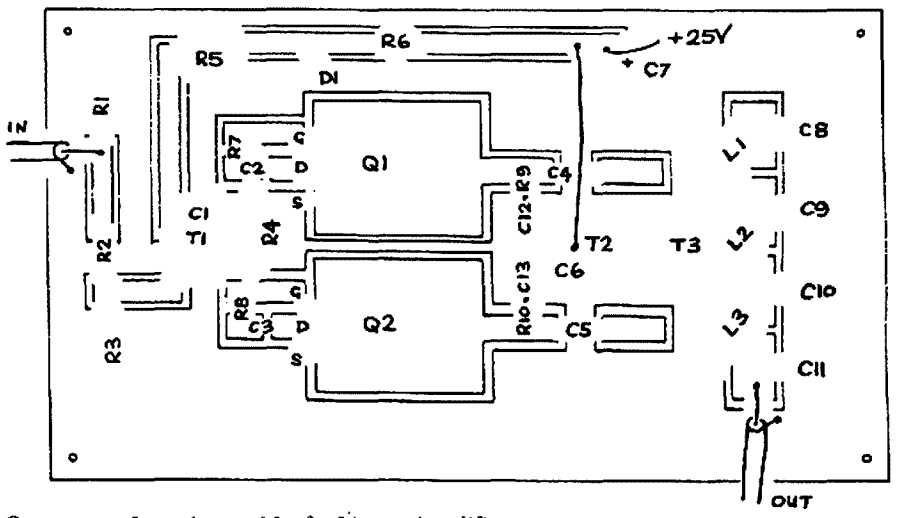
Shown is a suggested dummy load if you do not already have something for the job (due to their non-linearity, ordinary lamps are not very good for this application, and large non-inductive resistors are now very scarce). Seven ordinary 1W carbon or metal film resistors, each 470 ohms, two 390 ohm 1W resistors and a 6V/150mA lamp are connected as shown. Leads should be as short as practicable. As is, this load will take 25W at 50 per cent duty cycle in short bursts. It would be a good plan, however, to house the load and lamp inside a glass jar with a suitable connector fitted to the screw-top lid. To increase the dissipation capacity, the jar should be ⅞ filled with some benign clear oil such as paraffin or peanut oil. Leave an air gap for expansion.

Problems

If, after unsuccessful attempts on your part, the amplifier will not work satisfactorily, please write to me about it, and any reasonable amount of assistance will be extended (SASE please).

Parts

The components for this project, including $1 Mosfets, were purchased from Truscotts Electronic World ((03) 723 3860. Will answer mail orders). Stewart Electronics ((03) 543 3733) can also supply many of the parts, including Amidon cores and mica capacitors. Other suppliers of Amidon regularly advertise in this journal.



Component Locations – Mosfet Linear Amplifier

References and further reading

1. *Power Mosfet Transistor Data Book — Motorola*
2. Gottlieb, *Solid State HF Power* — Reston Publishing Co.
3. Butler VK5BR, *Power Amplifier Using Mosfets* — AR Nov '89
4. Hayward & DeMaw, *Solid StateDesign* — ARRL
5. Diamond VK3XU, *Mosfet Power Amplifier* — AR Oct'88
6. DeMaw W1FB, *Power FET Switches as RF Amplifiers* — QST Apr '89
7. Hayward W7ZOI and Damm WA7MLH, *Technical Correspondence* — QST Nov'89 ar

Technical Correspondence

"1GHz Frequency Counter Modifications" by Chris Skeer

I read the above article, published in September 1990 *Amateur Radio*, with great interest and would like to add a suggestion. I have been constructing a frequency counter based on a Z80 microprocessor and it is nearing completion. The designer recommended as prescaler a Telefunken U664B (÷64) and warned against using its stable-mate the U664BS. This latter device is designed to oscillate in the absence of an input signal in the manner indicated by Chris in his article. Obviously this is most undesirable in a counter prescaler, but useful in phaselocked loop applications.

The U664B doesn't oscillate in my counter and I suggest that there may be a U864B which also doesn't oscillate and may, therefore, be used as suggested by Chris but without the fiddling with input biasing which probably reduces the sensitivity. My U664B divides reliably with 8mV RMS into 50 ohms approx at 990 MHz.

Keith Gooley VK5BGZ
Torr-Crest, Tenafeate Crt
One Tree Hill 5114 ar

Commodore C-64 Overheating Problems

BY PETER MCADAM VK2EVB

THIS ARTICLE IS WRITTEN in conjunction with the author's previous article relating to problems experienced with C-64 power supplies *(AR Nov '90, p20)*. During investigations into similar symptoms to those described in the last article, further faults in different computers made their appearance during 24-hour test periods. The first thing that was apparent upon opening the computer case was the quantity of heat or hot air that was trapped inside. Also some chips notably the VIC chip (U19-6566/6567 or 6569) were too hot to touch for any period, and the SID chip (U18-6581) was almost in the same category. In some cases, these "ICs" have just failed without an apparent cause, presumably due to overheating.

The colour Video Interface Controller 6567 has a form of heatsink built in the design layout of the older model computers. This is composed of an integral shield enclosure-cum-heatsink with a snap-off lid. On the inside of this lid, a springy paw extends down and contacts the top of the VIC chip to dissipate heat. To start with, this contact often has dry heat conductive paste on it which renders it a bit useless. Secondly, the top of the lid is perforated to allow heat to escape, but the sides of the shields have no hole or vents to allow a convection current to circulate air. The obvious cure was to carefully remove the shield from the circuit board and drill a row of 4mm holes around the sides, as can be seen in the photo. Following replacement of this shield, and a good smear of heatsink paste on the paw attached to the lid before snapping it into place, heat dissipation appeared much improved and hopefully the working life of the chip should be extended. In some cases the VIC chip appeared to fail when extremely hot, but following the above suggestion it was kept at a heat level which allowed it to continue functioning without a new chip being substituted. It was certainly much cheaper than the $62.46 for a new chip, too. It should be noted at this stage that later models had only a 6567/6569 and an 8701 under a wing roof type cover, and in these models the VIC chip appeared to run a bit cooler, but probably still would benefit from a heatsink glued to its surface.

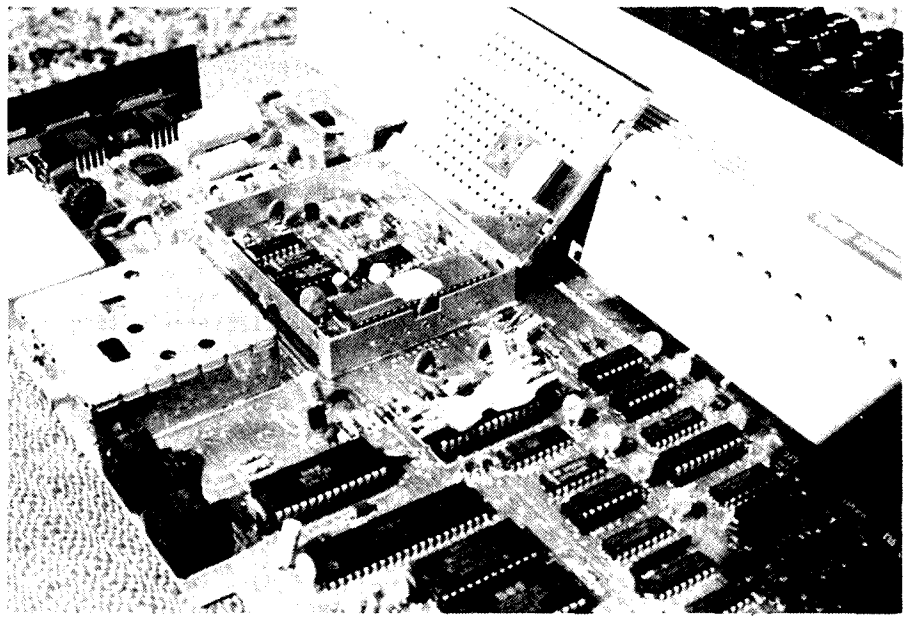


Photo of the Commodore 64 with cover removed

The Sound Interface Device 6581 is another chip that would be easier to care for than replace ($31.54). As one can see in the photo, a heatsink has been cut out of scrap aluminium and was secured on the back of the 6581 with epoxy resin. This was most beneficial and definitely dissipated heat at a greater rate than the flat top of the "IC" could. Also, the 7812 on-board regulator was provided with a heatsink, although it did not appear to get very hot.

The next move was on the lines of case ventilation. The bottom of the case had plenty of air intake, but the top had very little in the way of effective exhaust vents. The answer, naturally, was to drill a row of 5mm holes right along the back shoulder of the case to provide decent ventilation. Again a convection current would result, causing a movement of cooler air into the computer, thus cooling it. It should be noted at this stage that some computers will have the metalised cardboard shield inside them and the author detached this and disposed of it, as it appeared to do very little anyway, other than trap heat. If you have a hash problem in your receiver generated from the computer, chances are that earthing the computer chassis, as well as your radio, would be more effective in reducing hash than the metalised cardboard shield. If you decide to retain the shield, perhaps it could be perforated to allow air flow.

What I have heard, but not experienced yet, is that the old 1541 disk drive with the built-in power supply has a heat problem too, and sounds like it needs some help with ventilation also. The newer 1541 MKII disk drives have been designed with an external resin-filled power supply to presumably overcome the problem.

The opinion that "effective cooling prolongs component life" is not only held by the author but is known to be a major factor in successful electronic equipment design, even in this day of modern solid-state circuitry. Also, once again, remember that the Commodore C-64 is extremely susceptible to mains noise/surge so protect your equipment with a power surge protector/filter. It may just stop your computer locking up every time the fridge or washing machine starts or stops.

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Getting Started with Amateur Radio Satellites — Part 1

(This is the first of an eight-part series on this topic. Ed)

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD
YARRAVILLE 3013

YOU'VE PROBABLY BEEN thinking about it for a while. Maybe even had a bit of a dabble and got disappointing results. Perhaps you've been put off by all the technical jargon. Or maybe you think your gear isn't up to it and a new rig is too expensive. Well, none of the above thoughts is unusual, so read on. You've made the first step already by glancing at this article.

In the early days of broadcasting, amateurs showed the way. They were in the vanguard of technical development, and many of today's radio broadcasting giants had their origins in amateur radio.

The popular belief is that these days radio hams can't contribute to technical development. Well, think about this. The first amateur satellite was built and launched only four years after Sputnik. And it worked first time, which is more than some commercial groups can claim. Amateur satellites like Oscars 10 and 13 are closely watched by commercial radio communications companies. Their R&D departments monitor the performance of these birds and are not backward in stepping forward with expensive bits to test in our amateur satellites. The Oscar-13 team was given a special radiation-hardened memory chip worth around $100,000 by a manufacturing company in the USA. A very generous gesture, for sure. But what is a free, orbiting test platform worth to their R&D team? A recent news item has revealed that no less a company than INTEL is developing a series of micro-satellites as part of a global paging network. Amateurs have been developing microsats for many years. Four were launched in one shot early this year, along with two UoSats designed and built by Dr Martin Sweeting G3YJO and his team at University of Surrey. There is no doubt that companies like INTEL watch these birds closely.

You can take part in this exciting up-front area of amateur radio if you are prepared to hasten slowly.

Two pieces of advice before you even think about giving it a go.

1: If you live in a noisy location you can just forget about it. The first thing to remember is that you are dealing with very weak signals; which brings us to the next point.

2: You have to be prepared to give it your best shot. Even if it's a very simple shot. I don't know of anyone who has done much good with a haywire setup. They generally give it away (blaming the satellites, of course).

If you think you can handle the above points, read on and enjoy.

Probably the best way to start is to have a really good listen and see what you can hear. This is not bad advice for any amateur radio activity! Now you'll need to know a few things before you waste a lot of time.

You'll need to know what it is you're listening for.

You'll need to know what frequency to listen on.

You'll need to know when to listen.

You'll need to know what equipment to use.

Let's look at these points one at a time. What are we listening for? You must realise there are lots of satellites up there. We'll start by looking at DOVE (Oscar-17), ie the 17th Oscar to be put into orbit. DOVE will be our first satellite of the month. Why DOVE? Well, its signals are as strong or stronger than most. It's not a complex satellite. Essentially it has only a telemetry beacon and a digitalker. You won't make much out of the telemetry unless you have a packet radio setup, but you should be able to hear the digitalker with very simple gear. This is a computerised voice simulator and is responsible for DOVE's name. It's called a Digital Orbiting Voice Encoder; how about that?

The signal from DOVE sounds like a regular buzzing noise interrupted by bursts of irregular buzzing. Rather like a packet radio signal with an 'idling' tone in between. It switches itself off completely for 30 seconds every couple of minutes. This is to allow the control stations to communicate instructions to the satellite. It is a narrow-band FM signal.

You should listen on 145.825MHz. This frequency is a common one used by a number of amateur satellites for their downlink data. Downlink, of course, is the term given to the data or whatever coming down to your station from the satellite. There's your first bit of jargon, hi. Now, here's another important bit of jargon. You'll hear it regularly. It's regarded by many people as quite mysterious, but it's not. I refer to Doppler shift. It has to do with the frequency of the satellite signals. The best analogy is that of a train blowing its whistle as it rushes through a station. An observer on the platform (hopefully not waiting for this particular train) would notice that as the train speeds into the station, the pitch of the whistle is rather high. On passing the observer, the pitch of the whistle appears to drop to a rather lower frequency. This is caused by the train's velocity being first added to and then subtracted from that of the sound waves from the whistle as it speeds through past the observer. A satellite in orbit around the earth also first comes towards and then goes away from the observer. The satellite's velocity first shortens the wavelength of the signal as it comes towards the observer and then lengthens it as it heads away after passing close to the observer's QTH. All this means that when you first hear the signal it will be on a slightly higher than normal frequency and, as it passes by and moves away, the frequency will drop to a lower than normal frequency. The amount of Doppler shift depends on the nominal frequency, the velocity of the satellite and its position relative to the observer. In the case of DOVE and most of the other amateur satellites downlinking in the 2m band this amounts to about plus and minus 3kHz. So you should start listening for DOVE's signals at about 145.828MHz. As the satellite progresses through its 'pass' — there's another bit of jargon – you will have to follow the signal down to about 145.822 MHz. You will probably already have realised that the frequency will be exactly 145.825MHz when the satellite is closest to your QTH. At this point there will be no relative velocity and therefore no Doppler shift. It is well to note that an overhead pass, ie an orbit that takes the satellite directly over the observer, will produce the maximum Doppler shift, whilst a pass that appears

low in the sky may produce barely noticeable Doppler shift. Think about it. If your set can't tune in 1kHz steps, don't worry, just leave it tuned to 145.825MHz.

Now, when do you listen? This is a tricky one. If you have a computer, there's no problem. There's no shortage of programs and data to tell you when to listen. Use of computers in amateur satellite work is a subject on its own and will be covered in future articles. If you haven't got one, don't despair, ask someone who does have one. In most areas there will be a group interested in satellite operation. Don't be afraid to break in and ask for information. Once you know the exact time of one pass you can work out the time of subsequent passes very easily. Going back to the time of Oscars 6, 7 and 8, not many hams had a computer. Come to think of it, not many individuals or organisations had a computer. All calculations were done on paper. DOVE has an orbit period of one hour, 40 minutes and 46 seconds. This is the time it takes to do exactly one orbit of the earth. Its orbit takes it almost over the north and south poles; it is in a circular, polar orbit. If it wasn't for the rotation of the earth the satellite would come back over your QTH after one hour, 40 minutes and 46 seconds. But the earth does rotate, so the passes 'advance' around the earth from east to west. So the first pass you will 'see' will be in the eastern sky, probably quite low. The next pass may be almost overhead and the last pass (there are usually three in each set) will be in the western sky. You should hear three passes in the morning between about 7am and 10am, and another three passes each night between 7pm and 10pm.

Now, equipment. To simply listen to the signals all you need is a good 2m FM receiver and a ground-plane antenna. The signals from a setup like this won't be strong but you will hear them and, if the digitalker is operating, the signal should fully quiet your receiver. DOVE's telemetry transmitter normally runs at 250mW and, when the digitalker is on, it runs at 4W. That's about a two 'S' point improvement. A quarter-wave ground plane is better than a high-gain co-linear type vertical like a Ringo. The quarter wave will receive better when the satellite is high in the sky. Make sure you use your best bit of coax for the feeder and terminate correctly at both ends. Don't skimp here, this is your first lesson in giving it your best shot.

I don't want to put your hopes up too much, but I have heard UoSat-2 digitalker fully quieting on an ICOM IC-2a hand-held with its rubber ducky antenna. UoSat runs about 340mW. I know what I said earlier about weak signals and noisy locations, but remember we are just listening to hear the signals so far. If you tried to decode data or communicate using simple gear like that you would be sadly disappointed.

Listen in to the Amsat Australia net each Sunday night at 1000z on 3685kHz. It is excellent value. It's conducted by Graham VK5AGR. Call in to the net if you can.Call-ins start at about 0945z. The net moves to 40m in summer.

The next article will deal with orbit types. Satellite of the month will be UoSat-2. We'll take our simple station one stage further to look at easy methods of tracking with small Yagis.

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The Story of a Window

BY VK8** AN EX-WRAN

THE BEAUTIFUL STAINED glass window in the Naval Chapel at Garden Island, Sydney, commemorates not only the Women's Royal Australian Naval Service, but it also remembers Mrs Florence Violet McKenzie. Mrs Mac, as she was known to thousands of men and women, became a silent key on 23 May 1982.

The window features two WRANS, one in a wartime navy blue uniform with red badges, and the other in the peacetime white summer rig. The rich heraldic style border around the top and sides with rope intertwined, shows every category of badge worn by WRANS over 40 years of service. Across the bottom are the rank badges, linked together in a "chain of command".

Mrs Mac's WESC (Women's Emergency Signalling Corps) badge has a place of honour on the lower left-hand side. It appears as a nucleus which expands gradually in a blaze of beautiful marine colours to the Naval Crown in the arch at the top.

On 7 June 1985 the WRANS had ceased to exist. Those serving after that date were to become part of the Royal Australian Navy.

About this time, the RAN was encouraging Naval Associations to provide stained glass windows to enhance the entrance to the historic Naval Chapel at Garden Island. The ex-WRANS set to and established a WRANS Commemorative Window Committee, and with Jess Scott Doyle (nee Prain) as convener, they began the enormous task of planning the design, raising funds and of ensuring that the window would be completed in time for the 75th RAN celebrations of 1986.

It was a wonderful team effort by the Window Committee, with everyone doing her job magnificently.

Donations came in from all over Australia, from New Zealand and overseas. They came from men and women who held Mrs Mac in high regard; they came from those she had trained before and after the war.

An extract from the ex-WRANS Ditty Box tells part of the story:

"I wrote to a gentleman in Nova Scotia (now a professor of Maritime Law) who sent a charming letter and a nice donation. Another sent a donation from Tasmania.

Amongst others I contacted were members of the Airline Pilots' Association, Marine Pilots from NSW, Port Phillip and Torres Straits Service, and the company of Master Mariners, and the Institute of Navigation. They all had tales to tell of their involvement with Mrs Mac, and the members of the Institute of Navigation were especially pleased to donate to our window, as Mrs Mac was one of their foundation members.

How good it was then, when we talked to the artists at the Celtic Studios, that they immediately understood how we felt, and chose Mrs Mac's WESC badge to be the linchpin of their design, with all the lines emanating from it throughout the window. She never wanted to be eulogised, but I am sure she would have appreciated that little badge in our beautiful window."

The window is 8ft high and 3½ft wide and was dedicated by Lady Stephen, wife of the then Governor-General Sir Ninian Stephen.

Six of the original 14 WRANS, "Mrs Mac's girls" were present at the ceremony, five of whom came from different States in Australia, whilst the sixth, Denise Johnson (nee Owen) WRAN No 4, came with her husband from Hawaii.

At the service in the chapel, Jess Prain WRAN No 8, chose to use the Bible of Mrs McKenzie for the reading of the lesson, a fitting tribute to a wonderful lady.

The unveiling and dedication of the window was a momentous event on a magnificent day in a superb setting. It was 21 September 1986.

Mrs Florence Violet McKenzie VK2FV would have been delighted to have been present on that day . . . she was there . . . remembering quietly.

WRAN No 1240 ar

The Colvins in Australia

STEPHEN PALL VK2PS
PO Box 93
DURAL NSW 2158

Traveller's Tales and DXing

IN A PREVIOUS ISSUE OF 'Amateur Radio' (March 1990) we reported the visit of the famous DXing husband and wife team, Lloyd and Iris W6KG and W6QL.

Whilst in Sydney they gave an 'on air' interview at the broadcasting facilities of the WIA NSW Division at Dural, NSW VK2WI, during the regular Sunday news broadcast. They participated in the 'callbacks' on HF and exchanged greetings, experiences and views with the listeners of the broadcast. Iris and Lloyd were very impressed with the facilities and format of the broadcast, especially with the 'callback' system. They said, "We don't have anything like this in the USA."

A few days later they conducted a long seminar on DXing and amateur radio travel at the Parramatta "Amateur Radio House" headquarters of the VK2 Division. Here is a brief impression of this remarkable amateur husband and wife team, which — well past retiring age — is still very active, travels the world and activate one rare DX country after the other, to the delight of DXing amateurs world-wide.

The beginning

Lloyd W6KG got his amateur callsign in 1929 — 61 years ago. Iris W6QL received hers in 1945 — 45 years ago. This is a total of 106 years of amateur radio operating time which has produced many records. Those records were described in all their details in a previous issue of this magazine. It is sufficient to say that Lloyd and Iris devoted their life since the early 1960s to travelling the world on DXpeditions. Many countries gave them permission to operate; in some other countries, permission was not forthcoming, so they moved on.

The Colvins are travelling under the banner of the Yasme Foundation, but all their travelling expenses are met by themselves. Lloyd became interested in amateur radio at the age of 12 when he joined the Boy Scouts and learned the Morse Code. Iris, after her marriage to Lloyd, decided that a joint hobby is good for a marriage. She studied and received her callsign shortly after. The amateur radio future started with Lloyd before the Second World War. As a young man, living in Alaska, he bought some 40 acres of land at a very cheap price, and decided to put an antenna farm on it, especially two giant rhombic antennas. Fate decided otherwise. The US Army Signal Corps, having seen one of the towers which Lloyd had built, decided that was the site for which it was searching to install its own radio station. They made a financial offer to Lloyd for the land, which he could not refuse. This transaction started Lloyd, and later Iris, in the construction and building business, selling and buying property. These transactions gave them a secure financial base which allowed early retirement and independent means. It gave them time and the opportunity of amateur radio travelling. The real DXing started around the middle of the 1960s.

Iris W6QL and Lloyd W6KG in front of VK2WI transmitting station.

Yasme

The Colvins travel under the sponsorship of the Yasme Foundation, and this is also the QSL address of the Colvins (Yasme Foundation, PO Box 2025, Castro Valley, Calif 94546 USA). The history of Yasme makes interesting reading. Yasme in Japanese means 'good luck'. This name was given to a small 19ft long self-built boat by a young Britisher, Danny Weil, around 1948. He intended sailing around the world and, after many mishaps, got as far as the American Virgin Islands. Here he met and became friendly with a very famous DXer, the late Dick Spenceley KV4AA. Dick encouraged Danny to become a radio amateur, because through this media he would be able to receive help in his travels, and would also assist the amateurs to be able to work exotic countries where Danny wished to sail. The deal was done, and Danny did what no other amateur — according to the Colvins — has done before or since. In 30 days, by studying almost day and night, Danny absorbed all the technical and electronic amateur knowledge and passed the amateur radio examination with flying colours, transmitting 20 wpm in Morse. Danny sailed around, and on one of his trips met his future wife in Colombia. They sailed together for a long while, but the elements of the sea were not kind to them. Many times the end was on the reef and a wrecked boat. There were five boats in Danny's life, all called "Yasme", and all ending up on the bottom of the sea. At his wife's urging, Danny finally decided to give up sailing and, with it, amateur radio, and retired to the land. This was the time when the Colvins decided to go on DXpeditions and approached Yasme for the sponsorship name. Yasme was organised originally by amateurs to help Danny in his travels. Today, the Yasme Foundation Inc is nothing else but a big group of DXing amateurs who are interested in DX and DX operations. It is interesting to note that under USA law, all donations to Yasme are tax deductible. (*Do Australian politicians read this column? Ed).* Several prominent DXers are directors of the Foundation; the Oceania region is represented by Heather VK2HD, a well-known DXer.

The present trip

The Colvins' latest trip started late in 1989 when they finally received permission to operate from Niger, Africa, as 5U71L, and from Burkina Faso, Africa, as XT2KG. In Burkina Faso they worked 14,000 stations located in 161 countries in a three-week period. Early January 1990 found them in Bahrain with the callsign A92QL. The Colvins arrived in Sydney at the end of January, as a stopover to New Zealand. Originally they did not intend to be active, as VK is not considered to be a rare DX country, with so many active DXers. However, after gentle persuasion from friends and with the generous offer of accommodation and antenna facilities by Harry VK2BJL, they decided to have a two-week DX operation here. With the callsign VK2GDD they made over 4000 QSOs and worked 143 countries.

This brings the total of QSOs over the

past three months in four countries to over 30,000. Lloyd and Iris were specially appreciative of the service given to them by the Sydney DOTC office which provided both of them with on-the-spot over-the-counter callsigns.

The Colvins travel according to a well-proven plan. Round-the-world airline tickets with a well-known airline, paid well in advance, which gives them a special baggage concession of 160 pounds each (about 72 kg). The personal belongings for each are reduced to a small suitcase. The radio equipment, including the antenna, is specially packed. A small box with the rotator, many kilogrammes of coaxial cable, fittings and tools. The Hy-Gain TH3 is specially cut so it and the mast fit into a self-designed canvas bag, which is over two metres long and goes aboard the plane as luggage. The rest of the station is carried physically on the plane and stored away under the seats and head lockers. Lloyd carries the 21kg heavy Tokyo HI Power HF linear amplifier; Iris carries the 12kg ICOM 751A transceiver. They never hide their equipment, it is always out in full view, and they have never had any trouble with airline or other officials. Lloyd specially mentioned a few techniques which will help the average amateur to have that rare DX contact. "Listen and listen again," says Lloyd. "Find out the DX station callsign in advance; find out the system by which the DX station is managing the pile-up, transceive or "up 2" "up 3" etc, which can be mastered with the intelligent use of your RIT knob. Pay attention to the calling method: full call or the last two letters of the suffix? Call area? You should call back in the same way as the DX station is calling. Tail-end only after all the information has been exchanged between the two stations. If you have a set with two VFOs, practise well in advance the split system.

"It is remarkable," Lloyd says, "that a very great number of amateurs do not know how to work split frequency with two VFOs."

When on a DX expedition, Lloyd is working mostly in CW mode; Iris uses SSB.

Marooned on an Island

At the seminar, the Colvins related their travel experience in more detail and gave their audience the choice to pick the country about which they wanted to hear something.

We found out that when they were visiting Jordan they were able to use the Royal Amateur Radio Club facilities but they missed the royal appointment to see King Hussein. In New Caledonia they had to run a 100m coax cable from their hotel to a neighbouring property where the antenna was located. On the island of Juan Fernandez (the island of Robinson Crusoe) where the radio equipment and the fresh lobsters — carried as freight from the island — ended up in their lap. On Easter Island the giant stone monuments are all facing inwards watching the graves of their ancestor. In Nepal they met the well known and revered Father Moran 9N1MM. Not so long ago, in September 1989, the Colvins were the first foreign amateurs who received permission to operate from all Soviet republics, using radio amateur club facilities. One of the more personal experiences was told by Iris.

They went by boat to Ebon Island on the southernmost part of the Marshall Island group, about half a degree north from the Equator. The trip was planned to be of two weeks duration, so they carried all the necessary equipment and stores with them, including petrol for the generator. It was an old copra boat which plied its trade between the islands collecting copra from the inhabitants of these outlying islands. Ebon is a primitive Polynesian island with no stores or other facilities, and the natives follow their old traditional life. After the two weeks the copra ship did not return. It was only then that the Lloyds found out what happened. As the ship paid the natives for the copra only with money, and not goods on the old barter system, the natives told the ship not to come back. It was obvious that money was of no great value to the inhabitants when it can't be spent. The Colvins were marooned. With the little petrol they had left, they managed to get the radio going and arranged some emergency transport to come near the island in the future. For two and a half months they were waiting for the ship to come by. They spent the American Thanksgiving Day and Christmas on the island. This was an interesting society; it was a matriarchy. The women were the most important members of the society; they owned all the property on the island, including land. Men took the name of the women when married. At the end of the first two weeks, the women came chanting as a group to see the Colvins, and brought food. From this instant, the Colvins were accepted as part of the social life of the island and shared in the fishing catches. The food had to be eaten on the same day, as there was no way of preserving it. On their way to the island somebody had given them a handwritten dictionary of the native language, and this dictionary was a great help to them. When the boat finally arrived to pick them up and take them back to a more modern lifestyle, all of them had tears in their eyes.

At the end of the seminar at Radio Amateur House in Parramatta a small presentation was made to the Colvins on behalf of the VK2 Division, and they were given the Honorary Membership Certificate of the VK2 Division.

The Colvins left Australia on 8 February for New Zealand and, upon arrival, became immediately active with the callsign ZL0AKH. They intend to spend four weeks in ZL before proceeding to Tahiti and then back to California, USA. ar

The AUSSAT ATV Test

TIM MILLS VK2ZTM
c/o PO BOX 1066 PARRAMATTA 2124

HISTORY WAS MADE FOR Australia and perhaps the world when the television test transmission of VK2TVG the Gladesville Amateur Radio Club was relayed through a satellite transponder of AUSSAT, Australia's national satellite carrier.

The AUSSAT management offered the facility to the club after it had become aware of the weekly ATV test transmission on UHF TV Channel 35.

A transmission date of 14 November 1990 was set, and in the few weeks available a lot of arrangements had to be completed. There were links to AUSSAT to be found, ATV groups to contact for material and publicity to inform Australian amateurs generated. A transponder with a south-east Australian footprint was made available, 12 Watts on A2-T5. Word came back that some ATV groups were preparing material, and they and others were setting up re-transmission facilities.

The link was the hardest to organise. An input to AUSSAT was available at the nearby North Sydney TAFE College at Gore Hill, but no clear path. This was finally solved by the assistance of the ABC, which was able to provide a one-hop link to its tower with a split from there to the TAFE. It was discovered as the night arrived that the split went everywhere, including TCN Channel 9, which was going to edit live segments of the Gladesville transmission for inclusion in that night's Clive Robertson's "World Tonight" news program. There were two segments totalling four and a half minutes duration, a wonderful piece of PR for amateur radio.

The countdown to 7.30pm approached. From 7pm there was a test card radiated via AUSSAT and the local Ch35, VK2RTV. At 7.25pm the introduction segment, featuring the South Australian Quorn train museum introduced the test transmission in sound and vision to the as-yet unknown audience.

At 7.30pm it was live to air as Doug VK2XGX welcomed Australian amateurs to the history-making event. Doug then introduced Mr Graham Gosewinckel, the Managing Director of AUSSAT, to the studio and invited him to address the viewers. Mr Gosewinckel said it gave his organisation great pleasure to make this facility available for the test, for it was from radio amateurs that a country's technical support originated.

The introductions over, it was time to present a couple of segments from the Gladesville AOCP taped lectures to illustrate the club's involvement in educating the future amateurs. This was followed by the first ATV group contribution. It was also time to call for signal reports to see if there were any viewers. Indeed there were, and by the time the transmission concluded 139 had been logged, mainly by phone, local repeaters and a few by 80m. Perhaps not the best choice of frequency as sunset was only just occurring. A special QSL card is being sent to those supplying signal reports. (A few phone SWL reports did not advise an address. They may care to contact GARC with an address if they require a card).

Reports on the AUSSAT signal included major areas like Brisbane, Lismore, Newcastle, Central Coast, Sydney, Orange, Canberra, Wagga, Hobart and Adelaide. A problem occurred which prevented the re-transmission in Melbourne — a recording was made and subsequently re-transmitted. Single reports were received from country regions of NSW, Victoria and northern Tasmania. There were a couple of reports from Melbourne and Western Australia. The spot beam toward Perth from the satellite allowed reception on larger dishes and a recording was made and has been played in Perth. The spot was narrow as nothing was received at Albany. All reports received were acknowledged live on air, usually by Tim VK2ZTM, the second presenter.

Groups from Brisbane, Central Coast, Melbourne and Adelaide provided tapes. The WIA and ANARTS provided news segments, VK2 President Roger VK2ZIG and Councillor Roger VK2ZTB provided live interviews. There were taped samples of the Gladesville AOCP lecture tapes and an item about the work and function of the IPS.

All too soon, the three-hour allocation was used up, so it was time to wind up the transmission. A small seven-minute overrun caught those using the VHS format.

This test appears to have re-awakened an ATV interest throughout Australia. It would appear that the interest extended to the industry as well as the amateur radio fraternity, judging by the feedback to date. The Channel 9 World Tonight segment involved the general public. AUSSAT has offered a second test, and this has been scheduled for 30 January 1991. It will be dependent upon a more permanent arrangement for a link to AUSSAT at Belrose from VK2TVG at Lane Cove. The Divisional broadcasts will confirm the arrangements and transponder. Would the various ATV groups keep their reception and re-transmission facilities at the ready?

Tom VK2ATJ will be covering the reporting of the first transmission in words and pictures in the amateur media over the next few months, so watch for his reports.

This operation proved to be an interesting exercise in communications, even if it is our occupation and, to some, a hobby. There was little time after the date became available for publicity and the only amateur press with the time frame was "Amateur Radio" which carried the release in the November issue. The other method was sending the news releases to divisions, ATV groups and the weekly WI broadcasts. Thanks to all who assisted.

The NSW Division of the WIA was pleased to have been able to assist and promote this milestone in amateur radio. The real thanks, however, must go to Gladesville ARC and AUSSAT for getting together and making it happen. Thanks also to the ABC and North Sydney TAFE, the ATV groups, you the viewer and the host of amateurs involved in all aspects of the production. Finally, to Keith VK2ZZO, the TV co-ordinator for Gladesville, who anchored the whole operation — thanks, Keith. **ar**

The Case of the Disappearing Microwaves

DAVID G BARNEVELD VK4BGB
PO BOX 275 BOOVAL 4304

FOR THOSE OF YOU WHO have read some of my previous articles, you could be forgiven for thinking that I am a walking disaster area. After reading this one, your assumptions will be confirmed. However, life has its moments, and a few personal stories conveyed across bring a little bit of humour into our everyday lives.

This story concerns microwaves. Not the type radiating from a waveguide on a television link, but rather those entering your favourite piece of roast pork. You guessed it — the humble domestic microwave oven. The story unfolds during the summer of 1986; whilst in the process of building a new house, my wife and I moved into a small self-contained brick flat. To say that this flat was a hot box is an understatement!

During the trauma normally associated with moving camp, we purchased a brand-new microwave oven. The following day, my wife fixed lunch for us prior to our going out for the afternoon. As can be expected at this time, there were not many pieces of kitchenware unpacked, so a large 500g slab of butter, which had been unwrapped for lunch, was placed on a small plate at the dinner table. During the exercise of clearing the table after lunch, I placed the plate containing the butter on top of the microwave oven which, incidentally, sat on top of our new refrigerator, and promptly forgot about it.

During the course of the next few hours a minor calamity occurred. I say minor, because what followed, as you will read about later, can only be described as a full-scale disaster. What had happened was, that during the course of the afternoon, the temperature inside the flat had risen to almost 100°F and, you guessed it, the butter had melted into a large yellow liquid puddle.

Unfortunately, being on a small plate, the yellow flowing mass had nowhere to go except over the sides of the plate and straight into the ventilation slots that were located on the very top of this particular brand of microwave oven.

After recovering from the original shock, it was decided that a salvage and clean-up job would have to be implemented immediately. Once the top covers were removed it was a huge relief to discover that the melted butter had not fallen on any critical components, but rather had followed a groove under the lid and congregated in a puddle around the inner base of the unit. What a relief! All I had to do was find some way of degreasing the butter and it would be plain sailing from there on. Being employed with the State Electricity Commission at the time, I decided to contact a good friend of mine in the maintenance workshop for some advice. I didn't like the idea of pouring hot soapy water around the inside of the oven if I could help it.

After explaining the situation, my friend was most sympathetic and said he knew just the gear for the job. It turned out the gear was a super-dooper degreasing solvent supplied in 200-litre drums. The main use for this solvent was cleaning 275,000-volt ceramic insulators on electrical transmission towers. A little bit later, armed with five litres of the goodies, I set about the huge clean-up job. As a small amount of butter had solidified under the oven cavity, some means would have to be devised to squirt the solvent around in these tight places. I had just the very thing: a degreasing wand with suction line that was placed in the five-litre drum of degreaser. The pressure was supplied by my trusty 10cfm air compressor. The oven with all covers removed was placed on a wooden box in the back yard and away I went. With an ear-deafening blast the solvent was sprayed around the interior of the oven. A bit here, a bit there. It was working like a dream. Every bit of butter that could be seen was melting away. For that matter, so was everything else! Everything in the entire oven that was made of plastic or similar compounds was literally disappearing before my very eyes. Even the front door and control panel melted down. I'm not kidding folks, this is a true story!

The solvent literally melted down my new microwave oven in seconds. The only thing left was a mass of gooey plastic residue and a metal cabinet. I did manage to salvage the plate transformer out of the wreck, although not much of a consolation prize.

My friend (or should that read enemy) almost choked to death holding back a fit of laughter when I told him the story. "You told me you wanted to melt butter!" he retorted. "You didn't say anything about plastics." He's right! I should have done more research before spraying madly away.

The lesson to be learned from this episode is, if in doubt, test a little bit first. If still in doubt — don't!

I leave you with this thought: If your microwave needs a cleansing, don't call me! **ar**

Second Gladesville/AUSSAT Test

A second ATV test is being planned via an AUSSAT transponder for Wednesday 30 January 1991. Details have not been finalised, but it will be a similar format to the first test which took place on 14 November 1990. The theme this time is to be WICEN, and the various groups throughout Australia have been asked to contribute a segment.

You should monitor progress of this test's arrangements via your Divisional broadcast, if conducted during this month or via VK2WI — see page 3 for times and frequencies — on either the morning or evening transmission.

The various ATV groups are again asked to receive and re-transmit the AUSSAT signals through their local ATV repeater or simplex facilities. It is possible that a national coverage beam may be used. For contact information and other details see the Club Corner column in November "Amateur Radio".

DE TIM — VK2ZTM
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Scout Radio Station Needs Operators

KEITH ALDER VK2AXN
2 EULBERTIE AVE
WARRAWEE 2074

BACK IN 1987 SOME FRIENDS who are active supporters of the Scout movement asked me to help with advice on setting up an amateur station for training purposes and to communicate with other Scout groups worldwide. The site for the station is the Scout Activities Centre at Bankstown, a south-western Sydney suburb.

After I listed what they would need in equipment, space, power etc (including lots of options and alternatives) there was silence for a few months, after which I received a phone call — "well, we have set up the room just like you said, and raised the money for what you think we need — now, would you like to buy all that and install it for us, please?"

That took quite a while — we bought most of the gear second-hand through other amateurs (and ads in AR). Some was donated by friendly amateurs. In the meantime we made the necessary enquiries of DoTC about licensing conditions — there is a special block of callsign suffixes for Scout stations.

The only really difficult decision was how to put up the main HF antenna. We wanted a beam, preferably a tribander, but how to hold it up in the air? Whatever mast or tower was used had to be erected on top of the two-storey building housing the Activities Centre — which, fortunately, has a flat metal roof, but a couple of quotes from commercial tower providers soon showed us the answer wasn't easy. The quoted erection costs were more than the purchase price and the sum greater than our total budget!

Eventually we solved the problem another way. Being a keen sailor, I know a couple of shipwrights who get me out of trouble periodically, so we put out enquiries for a second-hand aluminium yacht mast, and in due course acquired a repaired mast from a "5.5" yacht, together with all its rigging — halyards, shrouds, crosstrees — and, in fact enough discarded rigging from other yachts (after little racing accidents!) to give us a mast, with all stainless-steel guys.

The top of the mast needed a few mods to fit the rotator, and we had to install a boat trailer winch to haul it up, but we finished up with a 40ft solidly built mast for less than the cost of the beam. (The most expensive single item was transport of the yacht mast to the centre).

The station was duly licensed in February 1988 with the callsign VK2SCB (Scout Centre Bankstown). It has the following equipment:

Yaesu FT757GX HF Transceiver
Yaesu FT901 HF Transceiver
Kenwood TW4100A 2m & 70cm Duobander
Yaesu FRG7700 General Coverage Receiver

In addition to the rotary beam there is a trapped dipole for 40 and 80 metres, a Butternut five-band HF vertical (both donated), separate 2m and 70cm verticals, and a separate receiving antenna for the FRG7700. We also have two scanners with their own antennas, mainly for listening on the "air band" because the Centre is also involved in flight training.

Some other equipment we had donated includes an oscilloscope and a crossed-needle SWR and power meter, now set up for continuous monitoring of HF transmissions, and a couple of multimeters and test oscillators. Another amateur gave us an automatic Morse keyboard, potentially useful for code training.

So there it is — a well-equipped station ready to be put on air whenever a licensed operator is available. And now we come to the sad part — despite the best endeavours of all concerned, we have been unable to find enough volunteers to operate the station. I can go there on weekdays — there are senior scout officials working there most Wednesdays and Fridays — but we need operators for evenings and weekends, when Scouts are free to attend. I am too far away (and, let's face it, too old!) for evening duty there, and otherwise committed in weekends.

We did manage to be on the air for JOTA in 1988 (thanks to VK2s DEJ and JJM) and again in 1989 thanks to VK2s KDJ, ENU, AML and KKV.

Perhaps I should add that the youngest members of our team which has put this Scout Activities Centre together are in their late 60s and we are all wondering whether or not there are a few young enthusiasts out there who are willing to volunteer a bit of spare time in a good (and enjoyable) cause. You don't have to be a Scout — I wasn't. (At least not for the past 55 years, though I've just been reinstated as an honorary Scout as a result of the labours at Bankstown).

Also, you don't have to be prepared to give instruction, though that will be very welcome if available. Demonstration is the first requirement; come and work a bit of DX in front of an admiring audience!

If you feel that you can help, please contact me, QTHR and phone book for the past five years — or, if in range of the Hornsby club repeater VK2RNS, 147.250MHz, look for me on or after our weekly club net, which I run from 8-9pm local time Monday evenings. Please help if you can!

Profile

Keith Alder VK2AXN started building radio sets in the early 1930s and was introduced to amateur radio in 1938-39 by Ron Williams SK- then VK3ZD, Ed VK3EM, and the Scotch College Radio Club. He did not return to it after the wartime shutdown for 39 years, until realising in 1977 that retirement was coming up fast and he'd "rather like to do that again".

Things had changed somewhat in the meantime; there was this mysterious thing called SSB, and all his valves seemed to be obsolete in the face of solid-state devices. So he started all over again, brushed up the code, and re-qualified with a new AOCP in 1978.

In the meantime he graduated in metallurgy at the University of Melbourne, worked twice in England for a total of six years in nuclear metallurgy, and spent a few years as a university and tech college lecturer in Melbourne and Newcastle.

He was the Head of Metallurgy when the Australian Atomic Energy Commission started the Lucas Heights Research Establishment in the 1950s, and became its director in 1961. Later he was a Commissioner and finally General Manager before retiring in 1982.

Keith is a Member of the Order of Australia and a Fellow of the Institution of Radio and Electronic Engineers Australia, and of the Academy of Technological Sciences and Engineering.

He is a member and past president of the Hornsby and Districts Amateur Radio Club, with principal interests sailing and going maritime mobile on his H28 ketch, and building his own equipment. ar

More About "Krait"

THE SHIP'S OPERATOR TELLS THE STORY

I WAS INTERESTED TO READ the mention on page 6 of AR October 1990 concerning the W/T equipment fitted aboard the wartime raider "Krait" which took part in the attack on Japanese shipping in Singapore harbour in 1943.

Perhaps your readers may like to know a little more about the communications arrangements and some of the problems that beset the naval radio operator, who incidentally, was a licensed Australian radio amateur operator, on that somewhat unorthodox voyage.

"Krait", a previously captured Japanese fishing vessel, sailed from the United States submarine base at Exmouth Gulf on 2 September 1943 for Singapore waters via the Lombok Strait, which runs between the islands of Bali and Lombok. On arrival at the target area, three two-man canoes were launched which attacked vessels lying at anchor in both the roads and harbour area of Singapore with magnetic limpet mines, resulting in the destruction of six merchant vessels and one large heavily laden tanker. Both "Krait" and her complement of 14 souls returned to Australia unscathed after a particularly tension-filled trip.

As to the communications equipment, it is true that the vessel was equipped with a complete AT5/AR8 station, including the companion battery-driven-motor generator unit. The set was installed in No 3 hold which had been converted from a fish-hold to a W/T office and operations room, and at the same time provided sleeping and living accommodation for three officers. The dimensions of the room were, width approximately 9ft, length 8ft and ceiling height about 5ft 6ins. Persons entering the room had to remain in a stooped position or be seated!

International single-operator period watches were maintained on a daily basis, listening being carried out on discrete naval radio frequencies. When off watch, the operator was required to clean his weapons, which comprised a Smith & Wesson 38 revolver, an Owen machine gun and sundry other bits and pieces. As required, look-out duties were also undertaken — not too much time off to enjoy the balmy tropics.

The antenna system was a simple inverted "L" running from the main-mast which was some 20ft high, to a smaller mast of the order of 10ft high placed on the after engine-room canopy; the total aerial length was approximately 60 ft.

Needless to say, this antenna installation was not intended to last. It underwent some quite drastic pruning when "Krait" arrived about 60 miles south of Singapore. The main-mast was felled to reduce the vessel's profile and thus make her more difficult to detect by other surface craft. It also meant that the lookout seated atop the wheelhouse, which was approximately 8ft above the water-line, could now see any hostile surface craft approaching before it could see our vessel — thus providing ample time to take evasive action. The loss of the mast, of course, had a dramatic effect on communications — there was virtually nowhere to string an antenna! The problem was overcome to a degree by running a jury rig just beneath a wooden rail running around the sides of the vessel. It was fine for concealment, but radiation efficiency was very much diminished, notwithstanding the large sheet of copper that had been stretched along the ship's hull for earthing purposes. The physical aerial height was now some 8ft above the water-line at the forecastle end, falling to about 3ft at the lower end near the ship's wheelhouse; the total length was approximately 30ft. Even though the jury aerial was almost permanently wet from seas breaking over the ship's bow, it was still possible to receive signals from Australia at copy strength while naturally signals from Japanese stations remained at S9.

Only one message was transmitted during the entire voyage. It was sent in the afternoon of 15 October 1943 when the vessel was some 100 miles clear of Lombok Strait, heading back to Exmouth Gulf. Although VHM Coonawarra was the first station called, there being no reply, VIX0 gave a "K" and the following text was transmitted at high speed, "For Australian Commonwealth Naval Board priority immediate — mission completed — for Admiral Christie Lombok now patrolled — ETA pm 17th AR". A simple transposition code gave some security to the message.

The significance of the text was to inform the Special Operations hierarchy that the mission, which had the most slender chance of success, had indeed succeeded and that Admiral Christie USN had better do something pretty quickly to warn his submarine commanders that one of their favourite routes into the Java sea area was now subject to Japanese patrol craft, and that home sweet home was scheduled for 17 October.

In conclusion, the AT5/AR8 equipment didn't miss a beat, although the fuse department of the power supply required constant maintenance due to the ever-present sea-water sloshing around the floor of the W/T office, wetting the paxolin strip that contained the fuses, causing it to smoulder. After much scraping of burnt paxolin, the voyage ended with the fuses mounted in mid-air and simply supported by their connecting wires. The AT5/AR8 was all that was aboard, plus a couple of sets of spare valves and a few spare fuses; there was no back-up equipment, which probably says something for the reliability of the Australian made equipment. For light reading during the quiescent hours, the radio operator had taken with him copies of the Admiralty Handbooks for W/T parts I and II, 1938 edition, together with his home-brew multimeter. Needless to say, the handbooks remained unread for the duration of the voyage.

HORRIE YOUNG VK2AMZ
371A ORANGE GROVE RD
WOY WOY 2256

Note: Horrie, who is a life member of the WIA, is too modest to reveal that he himself was the operator! Ed. ar

The History of the WIA Journal

COLIN MACKINNON VK2DYM
52-52 MILLS RD
GLENHAVEN 2156
(PART ONE)

MOST WIA MEMBERS would know that *Amateur Radio* magazine was first published in 1933, but how many know that this year, 1991, is actually the 72nd anniversary of the Official Journal of the Wireless Institute of Australia? Yes, our official publication has been around a long time. It has undergone several name changes and had some ups and downs in that long period, whilst all the time attempting to chronicle the rapid development of our hobby. This article traces the background behind the various publications that preceded *Amateur Radio* magazine as our official publication; with a little WIA history thrown in.

The Early Years

Wireless experimenters were active in Australia from the late 1890s, but because they were few and far between, they tended to work in isolation or in very small groups. Even at the outbreak of World War I in August 1914, there were only about 400 licensed experimenters (plus 200 illegal operators) throughout Australia, and it appears that no-one considered it practical to publish a newsletter for the benefit of these wireless experimenters.

The war caused a significant change in wireless technology and created a large number of interested ex-service personnel who had served in the Signals musterings. They saw a need to band together and to have a means of communicating through the written word.

On 7 January 1919, the Wireless Institute of NSW met for the first time since World War I. Mr Malcolm Perry, who had been the secretary since 1911, convened the meeting in the classrooms of the Marconi School of Wireless and read the minutes of the previous meeting which had been held on 7 August 1914, just before the outbreak of war. Mr Ernest Fisk 2EF, the managing director of AWA, chaired the meeting and spoke of the dramatic advances in wireless techniques during the war, the part that experimenters oculd play in expanding knowledge of wireless and the difficulty they now faced to retrieve their confiscated equipment and pre-war licences. Fisk proposed "the amalgamation of every amateur wireless institute in the Commonwealth, to form one united and powerful body to demand from the authorities every consideration to which the importance of their work entitles them." What significant words these are. A committee was established to attempt to get the wireless equipment back, and copies of Fisk's speech were sent to wireless groups in all other states. At the first post-war general meeting of the Wireless Institute of NSW on 14 March, Fisk was elected President of the Wireless Institute of NSW.

AWA had its own publishing company, the Wireless Press, which printed a monthly magazine called *Sea, Land and Air*. It was first published on 15 March 1918 and was one of the earliest Australian publications devoted to wireless. It presented news of wireless developments in Australia and overseas, with a bias towards Marconi and AWA products. One of the early editors was S E Tatham 2ST. Given the dominant influence of Fisk and AWA, it is not surprising therefore that in March 1919 *Sea Land and Air* became the "Official Journal of the Wireless Institute of NSW" and printed news of WI of NSW meetings.

The first post-war meeting of amateurs in Queensland was on 19 March 1919. Following the lead set by NSW, they formed the Queensland Wireless Institute, affiliated with the Wireless Institute of Australia. Some time later in 1919 they adopted *Sea, Land and Air* as their magazine, too.

Fisk and Perry travelled to Melbourne and read extracts from the resolutions of the initial NSW meeting to a gathering from there on 1 April 1919, at which time a committee was elected to form the Wireless Institute of Victoria. They adopted the constitution and rules of the WI of NSW and, naturally, *Sea, Land and Air* became the official journal of the Victorian Wireless Institute from the issue of June 1919.

On 11 September 1919 the first general meeting of the Wireless Institute of South Australia was held and, like Victoria, it adopted the rules of the WI of NSW, including *Sea, Land and Air* magazine as its journal.

Sea, Land and Air spread its influence further by becoming the official organ of the Wireless Institute of New Zealand with the December 1919 issue. The NZ Society held its first general meeting on 28 October 1919.

On 3 November 1919, a meeting chaired by Professor Ross at the Perth University noted that "the club" had been inactive since 1916, but now the Wireless Institute of NSW proposed an affiliation. There had been a pre-war Radio Club of Perth, based at the university, to which Professor Ross was referring. The meeting adopted the name The Wireless Institute of Australia, WA Section.. (However, a council meeting of the WI of NSW on 23 January 1920 decided that the name should be "Division", not "Section" and urged the other states to adopt the change. That meant they were each to become the Wireless Institute of Australia (state) Division).

Therefore, by the end of 1919, *Sea, Land and Air* covered amateur events in all mainland states and New Zealand and had become the "Official Journal of the Wireless Institute of Australia" and this was proudly noted on its editorial page. In the following years the magazine presented news and technical articles of interest to amateurs and served as a focal point for amateur contact.

Sea, Land and Air ceased by that name after the March 1923 issue, but a new magazine, *Radio in Australia and New Zealand,* took its place. *Radio in Australia and New Zealand* continued as the official journal till October 1923 but then parted company with the WIA. The Magazine prospered for a number of years and was usually referred to as simply *Radio*. It did feature amateur news, but no longer had "official" status.

In the September 1923 issue of *Australasian Electrical Times* it was reported that "The Victorian Division of the WIA has decided to publish a quarterly report of proceedings." However, this did not eventuate and, instead, a deal was made with Magazines Ltd, a subsidiary of The Standard Publishing Co, to produce a monthly magazine devoted to the interests of Australian experimenters. This was *The Radio Experimenter,* costing 1/3d for about 32 pages and first published in December 1923. It was sub-titled the Official Organ of the Wireless Institute of Australia, but it appears to have been premature in claiming that title for reasons set out below. The magazine's editor was Howard Kingsley Love 3UM, who was the president of the Victorian divi-

sion at the time, whilst Ross A Hull 3JU, a councillor of the Victorian division, was the technical editor.

In May 1924, Victoria hosted the first Australian Wireless Convention at the Melbourne Town Hall. The delegates, representing the WIA in all states, initially voted for *Radio Experimenter* to be temporarly (sic) declared the official organ of the Wireless Institute, leaving the decision open for alteration at a later date. It appears then that any previous claim to official status by the magazine was presumptuous. It was pointed out at the convention that state divisions should not be forced to accept this magazine as it might not be able to cover matters as fully as local bulletins, so the motion was altered to provide that *Radio Experimenter* would be the official organ of the Federal Council of the Institute.

In June 1924, the name of the magazine was changed to *The Radio Experimenter and Broadcaster* and from then on it incorporated details and photos of wireless retailers and their showrooms. Coverage of WIA events was patchy, probably reflecting the difficulty in obtaining regular contributions. In July '24, the magazine was taken over by the publishers, The Standard Publishing Co; a new editor was appointed and it ceased to be the WIA journal. The magazine then changed its sub-title to "The Oldest Established and Leading Wireless Publication in Victoria". It continued under this title till June 1925.

Following the break with that publication, the WIA Victorian Division decided to produce a new journal and so, in August 1924, the magazine *Experimental Radio Broadcast News* appeared carrying the sub-title: "Official Organ of the Wireless Institute of Australia". It sold for 1/- and contained 50 pages of amateur and listeners news and technical wireless articles. The editor was again H K Love, still president of the WIA Victorian Division, with Ross Hull as the Assistant Editor. It was published by Wireless Publishers of Australia, at the same address as the WIA Victorian Division. Wireless Publishers was a private company controlled by 37 shareholders, mostly committee members of the Victorian WIA, which also held shares in trust.

Obviously someone pointed out that the magazine was still not entitled to claim to represent the WIA as a whole, because the second issue of the magazine was sub-titled "Official Organ of the Wireless Institute(Federal Convention) of Australia (Victorian Division)". That must have seemed a mouthful, because the phrasing was tidied up from issue No 9 with a new sub-title of: "Official Organ of the Wireless Institute of Australia (Federal Convention Victorian Division)".

The January '25 editorial page revealed that Love had become the managing director, whilst Hull was now the managing editor, with a Miss D M Mycroft as the secretary. The March '25 issue featured a new cover design and the name became simply *Radio Broadcast,* "Australia's foremost radio journal".

Later, from the August '25 issue, the editorial page added "with which is incorporated the *Radio Experimenter* and *Broadcaster",* the magazine that was detailed in previous paragraphs.

The Second Federal Convention of the WIA was held in Perth during August 1925, and B Jermyn Masters 3LM, representing Victoria, moved that *Radio Broadcast* become the official organ of the WIA. The controlling company offered to sell 4000 shares to the divisions so that they could share in the profits of the journal and to sell the magazine to members at 3/6 per year, post free. The Convention accepted the proposal (although there is no confirmation that any divisions took up shares) and the magazine, from the October issue, could now fairly claim to be the "Official Organ of the Wireless Institute of Australia". The editorial offices moved to Sydney to reflect the fact that the newly elected and first-ever Federal Council of the WIA was resident in NSW and the magazine was also printed in Sydney, although strangely it was now published on the seventh of the month, instead of the first. Ross Hull, in Melbourne, remained as the managing editor until he relinquished that position when he moved to Sydney around October '25.

Jermyn Masters in Melbourne then became editor and secretary and, with the February '26 issue, printing reverted to Melbourne. However, there appeared to be a problem as the magazine slowly went downhill. The cartridge paper cover was changed to a cheaper grade and the number of pages dropped to 34.

The magazine struggled on for another year, but the last issue in this format was Vol 3 No 5 of January 1927. An eight-page weekly pamphlet of the same name, costing 1d, but totally unconnected with the WIA and containing commercial radio programs, was issued as a new series with Vol 1 No 1 of 3 June 1927, but it lasted only four weeks.

The Turbulent Years

It is apparent that the WIA publishing effort faded out in early 1927 and individual states printed their own newsletters in the period from mid-1927 to 1929. It was during this period that dissatisfaction with the WIA led to the formation of the Amateur Radio Transmitters League and publication of local magazines called *CQ* in NSW and *QTC* in Queensland. The journal of the WIA NSW Division during this period of unrest was *Radio Journal of Australia* from November '27 to March '28. These three publications are detailed below. A further publication was the *WIA Bulletin* from Western Australia, which ran from around 1929 through to 1932, but I have not been able to trace its history.

Disenchantment with the WIA organisation in Queensland led a group of active transmitters to meet in April 1927 to form the Queensland Radio Transmitters League. The secretary was Major Leo Feenaghty 4LJ, who became editor of the group's newsletter, *QTC*. The first issue of *QTC* was July 1927 and it was issued monthly to the QRTL members. It was hand-typed by Leo and roneoed, stapled and distributed by a small band of volunteers each month. The cost of the newsletter was paid from members' subscriptions.

Radio Transmitters Leagues were promoted in the other states and, in August 1928, they amalgamated to create the Australian Radio Transmitters League (or ARTL) with headquarters in Queensland. QTC became the official journal for the ARTL. This ARTL was a strong group of transmitters, but the WIA was still dominant in some states and the radio authorities were reluctant to deal with more than one body representing amateurs. It made sense to reunite all amateurs under terms satisfactory to the interests of each, and discussions between the ARTL and WIA state divisions led to some degree of re-unification. For example, the Queensland Division of the ARTL was recognised as the local WIA Division, and so QTC was able to proclaim itself as the "Official Organ of the Wireless Institute of Australia (Queensland Division)" from the issue of May '29.

After much negotiation, the ARTL and WIA buried the hatchet and by July '29 the ARTL had merged with the WIA. Whilst I have not found evidence of official approval, the issue of QTC for July 1929 states that it is the "official organ of The Wireless Institute of Australia".

At the September '29 Federal Convention (No 6) of the revitalised WIA, held in Brisbane, it was suggested that *CQ* (the NSWRTL journal) should become the official organ of the WIA, with Leo Feenaghty being offered the job of editor. For reasons detailed below this did not come about and *QTC* continued as the official organ of the WIA.

(To be continued...)

AWARDS

PHILL HARDSTAFF VK3JFE – FEDERAL AWARDS MANAGER
PO BOX 300 SOUTHCAULFIELD VIC 3162

Sorry for the lack of an awards column last month, but due to moving house during the month I missed the deadline for the last issue. My plea for help in the last column with DXCC was answered by Steve Gregory VK3OT. Steve will be known as the DXCC Assistant and will look after the DXCC records, claims for new countries worked and the periodical issuing of updates. All DXCC certificates will be issued by myself, and all DXCC-related mail should still be addressed to the Awards Manager, DXCC, c/- the above address. The reason for using the Federal Office PO Box is so that if either Steve or myself, for whatever reason, cannot carry on our appointed tasks, we don't keep getting mail coming to our home address for the next 10 years, as did some of the previous Award Managers. Steve didn't waste any time and got stuck into the updates, so, over to Steve .

DXCC — WITH DXCC ASSISTANT
STEVE GREGORY VK3OT

DXCC Standings List

Germany

Per DJ4AX/PA3EUI, Y2 stations will keep their callsigns and will not change to DL or DM. Any new callsigns issued in the former GDR will also be the same prefixes as before. To prevent mailing problems, it has been suggested that you should mark your QSL cards as East or West, purely to discriminate between towns of the same name, and clearly state the postcode on your mail.

The DXCC standings lists reflect the reunification process, and everyone has lost East Germany or GDR, but has retained West Germany as the qualifier.

Yemen

On the subject of Yemen and PDR Yemen, they are both deleted and are now on the deleted listings. If you worked 7O1AA or 7O8AA they will both count and both are acceptable for DXCC purposes and satisfy the new country of Yemen. The ARRL accept after March 1991, so send it in to us first and get credit.

Abu-Ail

Abu-ail is supposed to be off, but is in limbo, so I have not taken any action as yet.

Deleted countries

Finally, if you worked CR8AJ, CR8AI from Portuguese Timor, why not send it in for a deleted total addition? Also, any VHF types who worked VK9 before independence may have these on their deleted totals. It seems to be that the deletions only will separate the 300-plus holders on the standings list very soon.

If there is anything you would like to know or suggest (politely), please write, and please use the latest DX listing to assist with cross-checks, which take over an hour on a full 300-country check.

I am sorry if there are any errors in the tallies below, but I had to go back many years to obtain some totals. There have been many changes in prefixes of some countries, in particular the Yemen deletions, which some operators have had on their standings lists for over 30 years, eg VS9 Aden and Socotra. If there are errors in your score, please send me your version. If possible, follow the most recent DXCC standings list you can find.

The current country total is 322, which is not reflected in the 1989 ARRL list, so hopefully we can publish one soon. Any ideas of the format you would like? Two columns per page to make it easy to read, or three to make it compact?

Let Phil know as soon as possible. Now it's back to the dusty old records.

Congratulations to Jim VK6RU as TOP-GUN and 73. See you next update. Steve VK3OT.

DXCC Open/mixed tallies

322/373	VK6RU	308/319	VK3QI
319/363	VK4KS	306/356	VK4FJ
318/349	VK5WO	306/311	VK7BC
317/350	VK4RF	304/321	VK5WV
317/326	VK3OT	302/339	VK3XB
317/325	VK3AKK	299/323	VK4PX
314/329	VK3AMK	299/310	VK1ZL
313/359	VK6MK	295/299	WB3CQN
312/354	VK3YL	293/309	VK4BG
311/324	VK4AK	292/294	VK2AKP
310/349	VK4SD	291/309	VK4UC
310/330	VK6HD	290/314	VK2SG
308/345	VK7LZ	287/312	VK2APK
308/330	WA3HUP		

DXCC Standing List CW

311/357	VK2QL	278/295	VK6HD
304/340	VK3YL	276/303	VK2APK
302/348	VK2EO	275/317	VK6RU
300/330	VK3XB	250/291	VK3RJ
298/322	VK4RF	247/248	VK3AKK
297/345	VK4FJ	238/260	VK3TL
286/326	VK3YD	223/243	VK5WO
280/303	VK3KS	211/220	VK3JI
278/313	VK7LZ	204/211	VK7BC

DXCC SSB/Phone tallies

322/373	VK6RU	303/307	VK6HE
319/380	VK4KS	300/343	VK4FJ
319/339	VK6LK	299/305	VK3RF
318/360	VK4LC	299/300	VK1ZL
318/348	VK5WO	299/300	VK3DYL
317/367	VK5MS	297/303	VK7BC
317/333	VK4RF	294/308	VK1WB
317/326	VK3AKK	294/328	VK2APK
316/382	VK6MK	292/312	VK4PX
314/329	VK3AMK	290/294	VK6YL
314/323	VK3OT	287/292	VK6IR
313/350	VK5AB	287/290	VK6IH
312/324	VK6NE	285/291	VK7AE
310/314	VK3CSR	285/290	VK2DU
309/324	VK4VC	284/290	VK3DU
309/321	VK4AK	280/293	VK5OU
307/320	VK6HD	278/279	VK5EE
306/326	VK7LZ	276/298	VK3KS
306/316	VK3QI	287/271	VK3CYL
305/321	VK5XN	265/281	VK2AAK
305/310	VK3AWY	285/270	VK5RX
305/308	VK3WJ	259/261	VK3VU
304/321	VK5WV	257/258	VK3DP
304/307	VK6AJW	256/298	VK3NC
304/306	VK3YZ		
254/274	VK2SG	225/240	VK3VQ
252/277	VK3TL	220/222	VK5BO
245/256	VK3VK	212/213	VK8YF
245/260	VK3JI	202/205	VK6NAT

Note: figures above are: valid score/countries worked including deletions

Worked all VK call areas (WAVKCA)

No	Call	Name
1832	EA5DW	Emilio Gracia
1833	ZL1BJN	W K Schief
1834	HE9DWW	J David
1835	JE6LDS	Hiro Yamashita
1836	W9GCH	Earl Niemoth
1837	JA8BTN	Bin Ohisuka
1838	VK5NVW	Bill Vogel
1839	ZL2JJ	Peter Byam
1840	G4ASL	Stephen Ayling
1841	KA3DBN	John Rouse
1842	KA1LMR	Chris Merchant
1843	KA4GYU	Bill Rowlett
1844	JA7DAT	Tomihisa Murakami
1845	YB1DOA	Iman Sulaeman
1846	JA2DSF	Akihiro Ooki
1847	WB5MTV	Geoff Kolb
1848	DE0THM	Theodor Moll
1849	AA5BT	Derek Wills
1850	KM4RX	Walter Stewart
1851	JF1ERP	Hisamaro Kiyooka

WIA80

No	Call	Name	Endorsement
46	VK5NOD	D A Thornley	First VK5
47	N4CSF	Louis Raymond	
48	SM4CTI	StenTegfors	First Sweden
49	L30037		First SWL
50	SM0CCE	Kjell Edvardsson	
51	VK7RY	F E Nicholls	First VK7
52	VK3CWJ	John Cocking	
53	VK2FFH	Arthur Harris	All 80mx SSB
54	JH7MSQ	Ken Takashima	
55	G4GVC	John Moore	All CW/First England

Worked All States VHF

179	VK3BRZ	C Gnaccarini	6 metres
180	WA6BYA	R Stohl	6 metres
181	ZL1ADP	F J Medland	6 metres

Worked All VK Call Areas VHF

39	ZL1ADP	F J Medland	6 metres

VHFCC

122	ZL1ADP	F J Medland	6 metres

Congratulations to Edgar Nicholls VK7RY for his WIA 80 Award as Edgar is also an octogenarian, having been born in the same year as the WIA. Well done Edgar!

CQ Magazine Awards

Bill Vogel (VK5NVW) informs me that he is an authorised checkpoint for CQ Magazine awards and can supply rules, application forms and check cards, so don't send your valuable cards to the states unnecessarily, contact Bill instead. (He doesn't say so, but an IRC or SAE probably would be appreciated. Bill's address is:

Bill Vogel
16 Wandilla St
Largs Nth SA 5016

Tasmanian Devil Award

Congratulations also to Lewis Smith VK2LS for working 400 VK7 stations for the Tasmanian Devil Award (total ham population of VK7 is 670) which is quite some achievement. It has taken Lewis seven years to get up to the 400 mark.

Australian Amateur Radio Postcode Club (Award)

Full details of this award appear in the October 1990 issue. Please note these changes

to the net times: every Saturday at 0030 UTC on 28.480MHz and at 0900 UTC on 3.600MHz. All else remains the same. I hope to have a sample for the column soon.

Grid Square Award

The feedback on this was a little on the quiet side, but what I did get was encouraging. Basically there will be a few changes, but the start date will definitely be 01-01-90, so start collecting grid squares now — QSL cards will not be required. More next month — in the meantime any feedback on the draft rules published in the October '90 column would be appreciated. My new home phone number is (03) 431 2121.

Blue Mountains Radio Club Award

From D E Reed VK2UM comes details of the above award.

Rules:

(1) Five contacts with club station VK2HZ. Only one contact per band being valid on each calendar day.

(2) Alternatively log contacts with four club members and one contact with the club station.

Also available to SWLs.

The award is free excepting the cost of postage.

To obtain the award send a log extract with unfranked postage stamps to the value of 85¢ to: The Award Manager
PO Box 54
Springwood NSW 2777

That's it for this month. All the best from Phill and Steve.

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CONTESTS

NEIL PENFOLD VK6NE
CONTESTS CO-ORDINATOR

RD Contest Results for 1990 Trophy Winner — VK3

Final Scores

Final Score = $\frac{\text{No Logs}}{\text{No Licences}}$ x Total Points x WF

Weighting Factor

VK1 24/416 x 2449 x 1.06 = 149.79
VK2 55/5471 x 4825 x 7.05 = 343.56
VK3 133/5126 x 17572 x 4.59 = 2088.98
VK4 105/3123 x 10772 x 4.55 = 1646.82
VK5 71/2083 x 8679 x 1.45 = 429.13
VK6 108/1716 x 11103 x 1.47 = 1026.62
VK7 41/659 x 4099 x 2.03 = 517.56
VK8 3/205 x 169 x 9.73 = 24.01

Results in Numerical Order

1st	VK3	2088.98
2nd	VK4	1646.82
3rd	VK6	1026.62
4th	VK7	517.56
5th	VK5	429.13
6th	VK2	343.56
7th	VK1	149.79
8th	VK8	24.01

Comments from the RD Logs

I observed that the RD goes to sleep from around midnight, and that enthusiasm and participation could be greatly improved if repeat contacts on HF were to be allowed. VK4NLV.

This is our 42nd year of participation in the RD; missed in '74 as we were in Sweden but listened and heard the VK signals — interesting to note six of the 1948 contest participants were operating this year — VK6RU, 2PA, 3XK (now VK4XA) 6WT and ourselves, Ivor and Mavis, VK3XB and VK3KS.

(Add another, Ivor! As VK5BP I also was in the 1948 Contest. Bill VK3ABP)

Contest seems to be on the improve; most pleasing to hear Scout stations working; doing a good job was VK7SRS . . . VK4MWZ. Started late, spent Sunday morning repairing my 15m Yagi and was ill all week up to the contest; will use my computer next year if I can find a log or contest program for my Apple IIE . . . VK2LEE.

Pleased with rig, could hear a lot! Used my trusty G5RV and Ten Tec 540; activity a bit quiet compared to the early '70s; still a friendly contest . . . VK3DX.

Wish I had read the rules as published in AR for July earlier. On HF bands, courtesy was very noticeable . . . VK4ADY.

These were the worst conditions ever experienced over the last 30 RD contests. DX on 3.5 and 7 was fantastic, but very few VK stations heard/worked from Humpty Doo . . . VK8HA.

More activity on two metres in the Melbourne area this year compared to the past couple of years; HF activity also very good . . . difficult to find a spot on some bands; makes it a challenge to score points. Computer logging now in place generally, standard needed for serial numbers; should there be any different serial number for HF and VHF logs or not . . . VK3BGS.

Propagation from VK5 was disturbed; lack of ZLs on 80m; appreciate change back to earlier version of rules . . . VK5QX.

A recently obtained log-keeping program caused me incredible problems this year; the ruddy thing failed to save any of the contacts made in the last four hours, so no record of the last 70 contacts . . . VK6ED.

Rules and "weighting" procedures that have been developed and refined over the years are working well; can anything be done to maintain the friendly aspect of the contest as I fear it is rapidly degenerating into yet another "free-for-all" contest with bad manners and operating procedures predominating, particularly on VHF. This could be corrected by leadership, but who is looking for leadership in the heat of the contest One trick used by a person on VHF was to simply front every two hours and roar out the last three letters of his callsign without concern for anybody already using the frequency. Very quick, very effective, also very naughty and rude, ie unfriendly. Trouble was that a number of newer amateurs got the idea that this was normal amateur operating procedure; would it be too difficult to suggest that complete callsigns should be given . . . VK3JN.

It was six or seven years since I last went in the RD, and an opportunity to see who was still operating in the contest from my circle of old VK5 friends. Regular operators were VK5FM Pete and VK5BI Brian, now both silent keys, unfortunately. Persuaded to participate by VK3CGH, who was keen on winning the trophy for VK3. I then persuaded VK3APW Mike to have a go passing on the information that a good antenna for 80 was important; he then went on to beat me, and could be the top scorer for VK3. Good to see a lot more VK6s in this year's contest — but VK2 didn't seem very active. There was a lot of "hoo-ha" in the weeks preceding the contest because of confusion over the actual date; made myself unpopular by saying on a couple of occasions, "let's get on with the contest — whenever it is" . . . VK2BUI.

Interesting to see a number of operators using computers; was going to do the same but had some reservations — decided to opt for the old-fashioned method of pen and paper . . . VK3BGS.

Send the trophy back to VK3 . . . VK3 . . . From VK4OD; difficulty with a VK5 and his Morse.

And that closes off the RD for 1990; congrats to the trophy winner and the various operators who gained certificates for their efforts.

Comments from the logs extracted by VK6NE and the compilation of results done by VK6ANC, Northern Corridor Radio Group.

VK1

Points:	HF	Phone	1713
	HF	CW	0
	VHF	Phone	736
Total points scored =			2449
Logs			
Received:	HF	Phone	11
	HF	CW	0
	VHF	Phone	13
Total logs received =			24

VK1

HF Phone	Points	HF Phone	Points
VK1PJ	720	VK1OK	100
VK1BR	193	VK1ZX	40
VK1DW	165	VK1GD	34
VK1BAT	150	VK1ACA	33
VK1RH	137	VK1WW	10
VK1EV	131	Total	1713

VHF Phone	Points	VHF Phono	Points
VK1OK	101	VK1ZQR	55
VK1ZX	85	VK1GD	39
VK1ZAR	85	VK1RH	36
VK1ACA	85	VK1PJ	27
VK1DW	67	VK1VNG	14
VK1BAT	64	VK1BNG	14
VK1BBA	64	Total	736

VK2

Points:	HF	Phone	4015
	HF	CW	698
	VHF	Phone	112
Total points scored =			4825
Logs received:	HF	Phone	37
	HF	CW	13
	VHF	Phone	5
Total logs received =			55

VK2

HF Phone	Points	HF Phono	Points
VK2DVU	504	VK2XT	68
VK2DCL	396	VK2GHZ	62
VK2ZL	370	VK2ALZ	61
VK2LEE	259	VK2JQ	60
VK2NW	249	VK2BDT	59
VK2CKW	213	VK2PY	54
VK2DHU	142	VK2AYF	51
VK2BUI	138	VK2EGI	50
VK2PS	133	VK2BQS	40
VK2AAE	131	VK2RX	40
VK2CJH	126	VK2KIQ	32
VK2ANK	117	VK2DDB	31
VK2SRM	103	VK2ZA	30
VK2GS	86	VK2GV	26
VK2KGX	84	VK2EMU	25
VK2BYY	81	VK2LE/P	25
VK2FBK	76	VK2PN	25
VK2EY	68	Total =	4015

HF CW	Points	HF CW	Points
VK2EL	119	VK2GT	38
VK2TR	91	VK2AIC	34
VK2BHO	82	VK2JM	22
VK2DID	77	VK2ED	11
VK2II	64	VK2HQ	10
VK2GS	63	Total	698
VK2BRA	46	Total HF points = 4713	
VK2AZR	41		

VHF Phone	Points
VK2ANK	32
VK2JQ	28
VK2BDT	21
VK2EY	17
VK2XIJ	14
Total ·	112

VK3

Points:	HF	Phone	8240
	HF	CW	473
	VHF	Phone	8859
	Receiving		390
Total points scored =			17,962
Logs received:	HF	Phone	67
	HF	CW	15
	VHF	Phone	51
	Receiving		2
Total logs received =			135

VK3

HF Phono	Points	HF Phone	Points
VK3APW	590	VK3PD	258
VK3WP	544	VK3MCN	254
VK3YH	419	VK3XQ	243
VK3SAM	414	VK3APC	235
VK3TU	321	VK3ZI	225
VK3ALZ	311	VK3OM	183
VK3BPN	311	VK3SAA	164
VK3GH	308	VK3KJI	150
VK3NKP	285	VK3KU	150

HF Phone	Points
VK3ADW	135
VK3DDX	134
VK3XF	130
VK3CX	129
VK3VFK	121
VK3BRZ	114
VK3AEO	113
VK3EDP	99
VK3DNC	96
VK3CAY	92
VK3BJM	90
VK3ATL	76
VK3SM	76
VK3ABP	75
VK3VR	75
VK3MOT	72
VK3VT	65
VK3CAP	64
VK3CU	64
VK3DVT	61
VK3BJM	60
VK3XB	55
VK3BCL	48
VK3BFN	45
VK3CGH	44

HF CW	Points
VK3DVW	101
VK3XB	71
VK3DID	51
VK3AMD	50
VK3ANJ	50
VK3IY	45
VK3KS	40
VK3VT	28
VK3WI	28
VK3NZO	27

VHF Phone	Points
VK3XQ	464
VK3TAY	447
VK3ZUG	436
VK3BY	425
VK3VR	336
VK3BMV	324
VK3SAA	319
VK3JED	290
VK3APC	285
VK3CL	270
VK3DID	255
VK3AVV	215
VK3DUO	213
VK3CAP	207
VK3CGH	201
VK3KST	200
VK3KBX	197
VK3XMD	183
VK3NJE	155
VK3VT	155
VK3CU	148
VK3NE	147
VK3TJA	111
VK3MZ	105
VK3XBA	104
VK3BH	102

HF Phone	Points
VK3KMZ	44
VK3AMW	42
VK3EWD	41
VK3IY	40
VK3BGC	38
VK3BMV	37
VK3GAR	37
VK3CL	36
VK3IT	35
VK3YF	34
VK3DYF	33
VK3BVK	31
VK3JEM	31
VK3BY	30
VK3XH	30
VK3JED	29
VK3KS	29
VK3AEB	27
VK3BGW	27
VK3AEV	25
VK3ALD	18
VK3AOJ	17
VK3ACA	16
VK3BSR	15
Total =	8240

HF CW	Points
VK3DP	26
VK3MCN	17
VK3DNC	16
VK3FA	13
VK3ANP	10
Total=	473
SWL	
L30037	360
ME Hudson	30
Total	390

VHF Phone	Points
VK3ENA	101
VK3KJI	100
VK3KT	100
VK3BFN	100
VK3MDG	92
VK3CAY	87
VK3CRA	87
VK3YFZ	82
VK3ZXY	77
VK3JN	72
VK3PTR	67
VK3SM	64
VK3LT	61
VK3AEB	60
VK3TER	60
VK3BGW	59
VK3CWT	57
VK3GH	55
VK3XH	51
VK3BNK	30
VK3KPK	28
VK3BCL	21
VK3BRZ	20
VK3KMZ	19
VK3AEO	15
Total =	8859

VK4

Points:	HF	Phone	6934
	HC	CW	805
	VHF	Phone	3033
	Receiving		27
Total points scored =			10,799
Logs received:	HF	Phone	56
	HF	CW	16
	VHF	Phone	33
	Receiving		1
Total logs received =			106

VK4

HF Phone	Points
VK4YB	679
VK4LT	461
VK4BAY	352
VK4WID	348
VK4WIG	317
VK4VMP	291
VK4NEF	290
VK4WIR	266
VK4TN	250
VK4PS	207
VK4BTW	205
VK4KEL	203
VK4IS	190
VK4ACC	168
VK4YG	165
VK4MWZ	162
VK4WIZ	141
VK4ASF	130
VK4AVR	128

HF Phone	Points
VK4ACW	127
VK4PT	115
VK4AAK	107
VK4RM	102
VK4ATR	101
VK4BSH	101
VK4YZ	100
VK4SJP	94
VK4BNL	88
VK4OD	80
VK4BWS	73
VK4NFL	72
VK4PJ	69
VK4KD	66
VK4SEA	64
VK4SA	50
VK4VAT	50
VK4YX	50
VK4MCY	46

HF Phone	Points
VK4EHW	41
VK4ALM	40
VK4BG	40
VK4NWW	38
VK4DC	31
VK4AOR	30
VK4KGE	26
VK4ADY	25
VK4KIT	22
VK4KER	19

HF CW	Points
VK4XA	161
VK4XW	122
VK4JH	99
VK4GD	97
VK4WID	71
VK4OD	47
VK4MWZ	37
VK4XX/MM	36
VK4BRZ	32

VHF Phone	Points
VK4AMD	246
VK4WIZ	241
VK4ZDV	203
VK4ZML	202
VK4AL	200
VK4ZXZ	200
VK4ANN	175
VK4GUY	129
VK4VR	114
VK4AIK	113
VK4RX	108
VK4ZBV	104
VK4YPB	87
VK4AVR	78
VK4AOK	73
VK4YEA	70
VK4ASF	67
VK4YAK	60
VK4ALD	55

HF Phone	Points
VK4ADD	17
VK4RE	17
VK4BIF	16
VK4EH	16
VK4AEV	13
VK4VBT	13
VK4IW	11
VK4NJS	11
Total =	6934

HF CW	Points
VK4CF	25
VK4SF	18
VK4XJ	16
VK4VAT	13
VK4YD	11
VK4IW	10
VK4XG	10
Total =	805

VHF Phone	Points
VK4SEA	54
VK4BNL	53
VK4CHS	51
VK4TKA	45
VK4NLV	41
VK4PJ	40
VK4ZDK	40
VK4DI	39
VK4UJ	35
VK4IY	29
VK4ADY	26
VK4DJC	24
VK4DV	19
VK4ZBD	12
Total	3033
Receiving	
L40018	27
Total	27

VK5

Points:	HF	Phone	6058
	HF	CW	502
	VHF	Phone	2119
	Receiving		555
	Total points scored =		9234
Logs received:	HF	Phone	42
	HF	CW	8
	VHF	Phone	21
	Receiving		1
	Total logs received =		72

VK5

HF Phone	Points
VK5QX	682
VK5ADD	639
VK5AYD	601
VK5ARN	412
VK5NOD	401
VK5GN/P5	272
VK5BWH	256
VK5BJM	229
VK5CN	213
VK5WO	157
VK5ABS	150
VK5TP	140
VK5ZG	136
VK5GZ	130
VK5NN	122
VK5LL	120
VK5BVJ	109
VK5ST	103
VK5YI	100
VK5NID	91
VK5BFB	86
VK5NGM	86

HF Phone	Points
VK5UM	86
VK5NF	83
VK5UE	82
VK5XT	74
VK5AQ	56
VKHB5	52
VK5RK	51
VK5RV	44
VK5CJP	40
VK5ANW	39
VK5IT	36
VK5GV	30
VK5AOV	29
VK5ZJ	23
VK5SE	20
VK5KJT	18
VK5AEP	16
VK5CO	15
VK5KCX	15
VK5NEI	12
Total =	6058

HF CW	Points
VK5AGX	140
VK5MN	124
VK5GZ	72
VK5HO	53
VK5AF	45

HF CW	Points
VK5TL	27
VK5BS	21
VK5JG	20
Total =	502

Receiving
SWL N Young — 555 points

VHF Phone	Points	VHF Phone	Points
VK5EX	434	VK5RV	72
VK5KCX	383	VK5ANW	69
VK5BRC	127	VK5ZN	56
VK5MD	112	VK5ZHS	50
VK5SE	108	VK5PC	47
VK5KIA	104	VK5NEI	38
VK5ZNZ	90	VK5UE	35
VK5ZKK	85	VK5KX	26
VK5RR	84	VK5AOV	25
VK5KLH	79	VK5BJM	21
VK5NNM	74	Total =	2119

VK6

Points:	HF	Phone	4859
	HF	CW	261
	VHF	Phone	5983
	Receiving		155
Total points scored =			11,258
Logs received:	HF	Phone	50
	HF	CW	6
	VHF	Phone	52
	Receiving		1
Total logs received =			109

VK6

HF Phone	Points	HF Phone	Points
VK6ANZ	510	VK6QE	36
VK6ED	318	VK6RZ	36
VK6ATZ	304	VK6SH	36
VK5AMB	281	VK6ABS	30
VK6RG	280	VK6GGP	28
VK6NEB	242	VK6BO	26
VK6HU	237	VK6KH	26
VK6NAQ	235	VK6QB	24
VK6SAN	235	VK6AV	23
VK6SZ	233	VK6SAA	23
VK6RU	222	VK6SO	23
VK6YS	163	VK6EB	22
VK6JP	159	VK6NTJ	22
VK6DA	146	VK6KC	21
VK6BA	122	VK6NRJ	21
VK6QN	87	VK6GGA	20
VK6HQ	77	VK6GU	18
VK6FC	72	VK6IU	18
VK6YF	71	VK6AFA	17
VK6APK	60	VK6BEB	16
VK6KXH	56	VK6GGD	16
VK6NWD	47	VK6AN	12
VK6GM	42	VK6DJL	12
VK6HT	42	VK6SCS	12
VK6ATL	40	Total =	4859
VK6DM	40		

HF CW	Points	HF CW	Points
VK6AJ	121	VK6JX	22
VK6RJ	41	VK6ED	14
VK6AF	38	Total =	261
VK6WT	25		

Receiving
L60068 155 points

VHF Phone	Points	VHF Phone	Points
VK6CX	542	VK6DA	99
VK6WN	353	VK6FG	98
VK6YBQ	309	VK6DC	94
VK6ANC	267	VK6APK	88
VK6ZLZ	247	VK6FC	87
VK6AR	225	VK6HU	83
VK6JK	216	VK6SAN	82
VK6RG	194	VK6RO	67
VK6JP	192	VK6YCX	57
VK6LZ	167	VK6SZ	48
VK6ACN	162	VK6AMB	47
VK6SH	156	VK6BO	41
VK6NEB	154	VK6WZ	34
VK6ZIC	153	VK6GA	32
VK6GGA	146	VK6AFA	30
VK6ZSE	144	VK6ZBP	27
VK6BWI	137	VK6ZWM	26
VK6RRG	134	VK6WT	25
VK6TTY	130	VK6UV	20
VK6JIP	123	VK6XH	18
VK6ZPP	120	VK6SO	16
VK6GGD	117	VK6YL	15
VK6AXB	110	VK6AN	12
VK6GGP	108	VK6RZ	12
VK6SCS	108	VK6GU	10
VK6SAA	101	Total score =	5983
VK6YGH	100		

VK7

Points:	HF	Phone	2299
	HF	CW	257
	VHF	Phone	1543
Total points scored =			4099
Logs received:	HF	Phone	21
	HF	CW	3
	VHF	Phone	17
Total logs received =			41

VK7

HF Phone	Points	HF Phone	Points
VK7SRS	352	VK7NDO	70
VK7KC	334	VK7PP	60
VK7CK	280	VK7RY	60
VK7KZ	226	VK7JK	52
VK7RW	151	VK7FD	45
VK7KDV	100	VK7JP	42
VK7JWR	92	VK7NBF	42
VK7NGC	86	VK7RM	36
VK7NSS	74	VK7GB	28
VK7HK	72	VK7BM	27
VK7AL	70	Total points =	2299

HF CW	Points
VK7KR	137
VK7KA	100
VK7RK	20
Total points =	257

VHF Phone	Points	VHF Phone	Points
VK7ZBX	263	VK7ZMF	60
VK7KDV	220	VK7SA	56
VK7JWR	191	VK7JK	44
VK7GL	157	VK7HK	40
VK7FB	101	VK7EB	36
VK7RM	86	VK7ZRJ	32
VK7NDO	76	VK7KZ	26
VK7ZO	73	VK7GB	10
VK7ZJG	72	Total points =	1543

VK8

HF Phone	Points
VK8AV	88
Total points =	88

HF CW	Points
VK8HA	55
VK8AV	26
Total points =	81

Points:	HF	Phone	88
	HF	CW	81
Total points scored =			169
Logs received:	HF	Phone	1
	HF	CW	2
Total logs received =			3

ZL

HF Phone	points
ZL1BVK	622
ZL2ADN	229
ZM4GB	134
ZM1IM	128
ZL1BGT	78
Total points =	1191
Points: HF Phono =	1191
Logs received: HF Phone =	5

p29

HF Phone	Points
P29KFI	180
P29NJS	75
Total =	255
Points: HF Phone =	255
Logs received: HF Phone =	2

1990 John Moyle Contest Rules

Phil Raynor VK1PJ
John Moyle Contest Manager

1. Aim

To encourage portable operation on the amateur bands and is intended to help Australian amateurs become familiar with portable operation, thus assisting in training them for emergency situations. The rules, therefore, have been designed to encourage all amateurs to operate in the field.

2. Contest period

From 0100 UTC 16 March 1991 to 0759 UTC 17 March 1991. It is intended that this contest shall take place on the third weekend in March each year.

3. Sections

All entries are to consist of one choice from each of the following, eg six-hour, portable, single op, phone, VHF:

(a) 24 or six-hour operation;
(b) portable, home or receiving station;
(c) single or multiple operator;
(d) Phone, CW or Open mode;
(e) HF, VHF/UHF or ALL bands.

4. Scoring

For valid contacts:

(a) portable HF stations score two (2) points per contact;

(b) home HF stations score two (2) points for contacts with portable stations and one (1) point for contacts with home stations;

(c) all contacts on the 50MHz band score as for HF;

(d) the following scores may be claimed by portable stations operating on 144MHz and higher:

(i) 0 to 49km, score two (2) points per contact;

(ii) 50 to 99km, score ten (10) points per contact;

(iii) 100 to 149km, score twenty (20) points per contact;

(iv) 150km and greater, score thirty (30) points per contact;

and,

for each of these contacts in (ii), (iii) and (iv), the details of the respective station locations are to be supplied. Such details must include either latitude and longitude references for each station, or some satisfactory proof showing the distance over which the QSO was conducted. These details must be shown on the summary sheet.

5. Log submission

(a) Each log must be accompanied by a summary sheet that provides the following information: name, address, section entered, number of contacts and claimed score.

(b) The summary sheet should also note the equipment used, station location and for multiple operator stations, a list of all callsigns that operated the station, together with their signatures.

(c) The summary sheet shall include the following declaration signed by the operator or, in the case of a multiple operator station, one of the licensed amateurs who operated the station: "I hereby declare that this station was operated in accordance with the rules and spirit of the contest."

(d) Logs should be forwarded to The John Moyle Contest Manager, PO Box 315, Fyshwick ACT 2609. Logs are to be postmarked no later than 30 April 1991.

6. Certificates and trophy

(a) At the discretion of the contest manager, certificates will be awarded to the winner of each portable section. The six-hour certificate cannot be won by a 24-hour station.

(b) The President's Cup will be awarded to the portable station with the highest CW score. The recipient shall be presented with an individually inscribed wall plaque as permanent recognition.

7. Disqualification

General WIA contest disqualification criteria as published will apply to this contest. Untidy, illegible and messy logs will automatically be disqualified.

8. Definitions

(a) A portable station is one which operates from a power source which is independent of any permanent installation, ie batteries, portable generators, solar and wind power.

(b) The size of any portable station shall be restricted to approximately that of an 800m diameter circle.

(c) A single operator station is one where all operating of the transmitting apparatus is done by one operator only.

(d) A single operator may only use a callsign of which he/she is the official holder. A single operator may not use any callsign belonging to any group, club or organisation for which he/she is a sponsor except as part of a multi-operator entry.

(e) A multiple operator station is a station operated by more than one operator.

(f) Only one callsign may be used from a multiple operator station.

(g) Multiple operator stations may use only one transmitter on a given band at any one time, regardless of the mode in use.

(h) Multiple operator stations are to use a separate log for each band.

(i) A club, group or organisation, by default, is considered a multiple operator entry.

(j) No apparatus may be erected on the site earlier than 24 hours before the contest period commences.

(k) Assistance may be given to help the single operator prior to and during the contest. The practice of clubs or groups providing massive logistic support for a single operator is totally against the spirit of the contest. Offenders will be disqualified and possibly banned from participation in the contest for a period of up to three years.

(l) SSB, FM and AM all count as PHONE.

(m) CW and RTTY are both regarded as CW.

(n) It is not expected that any other modes would be used in this contest, but if they are, they shall be regarded as CW.

(o) All amateur bands may be used with the exception of the 10, 18 and 24MHz bands.

(p) Cross-band contacts are not permitted, except by satellite repeater systems.

(q) Cross-mode contacts are not permitted.

(r) Contacts made via terrestrial repeater systems are not permitted. However, repeaters may be used to arrange a contact on a simplex frequency.

(s) Portable stations are permitted to make repeat contacts and claim the appropriate points, provided that at least three (3) hours have elapsed since the previous contact with that station on the same band and mode.

(t) Home stations may not claim any points for repeat contacts.

(u) Stations are to exchange ciphers consisting of the RS/RST and a number commencing at 001 and incrementing by one (1) after each contact.

(v) Portable stations shall add the letter "P" to their own cipher, eg 59001P for the first contact.

(w) Multiple operator stations are to commence each band with 001.

(x) Receiving stations must record the ciphers sent by both stations being logged. QSO points will be on the same basis as for home stations, unless the receiving station is portable.

(y) The practice of selecting the most profitable operational period within the allocated contest times is not in the spirit of the contest and shall result in immediate disqualification. The period of operation commences with the first contact on any band or mode and finishes either six or 24 hours later. ar

Errata

In the Jack Files Contest Results reported in the October issue, we failed to mention that VK2LEE scored 580 points in section 4a. Apologies to Lee.

Ross Hull Contest

contributed by VK3ZJC

By the time you read this, the Ross Hull Contest will be well under way, hopefully with plenty of activity and plenty of DX. A reminder that the contest ends on 19 January and that logs must be received by 18 February. Early logs will be appreciated.

Several enquiries have been received asking whether locator numbers are a necessary part of the contest exchange. The answer is no — locators are no longer used as the basis for scoring and need not be exchanged. However, six-digit locators are an easy way of getting fairly accurate distance estimates, and they are suggested for this purpose. Otherwise "map and ruler" estimates are quite acceptable.

Distance Estimating Program

Last month we provided a simple program to find your six-digit Maidenhead locator from your latitude and longitude. There was an omission in the description of this program — in the third paragraph, the second sentence should read:

"The possible north-south error is about ± 55km, and the east-west error, for example at Melbourne's latitude, is ± 88km."

This month's program takes the locators of two stations and estimates the distance between them. This program is more than adequate for the Ross Hull Contest, but it does not have a high level of accuracy and is NOT RECOMMENDED for serious calculations.

Lines 215 and 220 input the locators of two stations. Note that it is only possible to get a useful distance from six-digit locators. However, for rough estimates (very rough!) you

can enter a four-digit locator, and line 265 will convert it to six digits by adding an "MM" to the string (this represents the centre of the locator square). Line 270 allows the use of upper or lower case letters when entering the locators of the two stations.

Lines 280 and 285 convert the locator string into degrees north of 90 degrees south, and east of 180 degrees west (the two starting points for the locator numbering). Line 290 converts these degrees to radians, and lines 225-235 then estimate the great circle distance to the closest kilometre. Note that this apparent accuracy is deceptive, because six-digit locators give only an approximation within a few kilometres.

The program is in GW Basic but can be used on an Apple by changing the "CLS" command to "HOME" and rewriting lines 250 and 255 as follows:

250 GET K$: IF K$ = CHR$(13) THEN 210
255 END

As with last month's program, there is no error trapping so it is possible to get ridiculous answers if you type in impossible locators. When typing it in, be careful with the punctuation signs, brackets and so on.

VHF-UHF Field Day

This contest will operate again over the Australia Day weekend, using similar rules to last year's. The Maidenhead locator system has been retained, although there have been minor changes in other rules.

There has been a great increase of interest in the higher bands during the past year and it is hoped that as many operators as possible will be able to take the opportunity to participate.

Duration: 0200 UTC Saturday 26 January to 0200 UTC Sunday 27 January

Sections: A: portable station — single operator

B: portable station — multiple operator

C: home station

General: All modes and bands above 30MHz may be used. Repeater and crossband contacts not allowed. Stations must remain within the one locator square for the duration of the contest. You may work stations within your own locator square.

Exchange: A serial number beginning at 001, plus Maidenhead four-digit locator. RS or RST reports may be exchanged but are not required in the log.

Repeat contacts: Stations may be worked again on each band after four hours.

Scoring: One point per contact, two points if both stations are portable. Multiply the local score on each band by the number of locator squares worked on that band, then by the appropriate band multiplier:

50MHz: x 1. 144MHz: x 2. 432MHz: x 4. Higher bands: x 6.

Logs: For each contact, UTC time, band, station worked, serial numbers and locator numbers exchanged, points claimed. The front sheet should contain the name, address and callsign of the operator, section entered, and a scoring table as follows:

Band	Points	Squares	Total (points x squares)
6m	xxxx	xxxx	xxxx
2m	xxxx	xxxx	xxxx
etc			
Overall total			xxxx

Awards: The highest all-band scorer in Section A; the highest scorer on each band in Section A; the highest scorers in Sections B and C.

Entries: Post logs to the Manager, VHF-UHF Field Day, PO Box 300, Caulfield South Vic 3162. Logs must be received by Monday, 25 February 1991. **ar**

PROGRAM: LOCATOR TO DISTANCE ESTIMATOR

```
200  REM ---------- Simple Locator to Distance Converter ----------
205  DIM C(6): PI = 3.14159265: DEF FN A (X) = ATN (ABS (SQR (1 - X^2) / X))
210  CLS: PRINT "Simple Locator to Distance Converter": PRINT
215  INPUT "Your home locator          "; L$: GOSUB 260: E1=E: N1=N
220  INPUT "Distant station locator    "; L$: GOSUB 260: E2=E: N2=N
225  AN = COS(E1 - E2) * COS(N1) * COS(N2) + SIN(N1) * SIN(N2)
230  AC = FN A (AN): IF AN < 0 THEN AC = PI - AC
235  D = INT (AC * 6367)
240  PRINT "Approximate distance (km):  "; D: PRINT
245  PRINT "Options:  <RETURN> to do another  <ANY OTHER KEY> to quit"
250  K$ = INKEY$: IF K$ = "" THEN 250
255  IF K$ = CHR$(13) THEN 220 ELSE END
260  REM ---------- 6 Digit Locator to Lat & Long S/R ----------
265  L$ = L$ + "MM": FOR X = 1 TO 6
270  C(X) = ASC (MID$ (L$,X,1)): IF C(X) > 96 AND C(X) < 123 THEN C(X) = C(X) - 32
275  NEXT
280  E = -180 + 20 * (C(1) - 65) + 2 * (C(3) - 48) + (C(5) - 65) / 12
285  N = -90 + 10 * (C(2) - 65) + (C(4) - 48) + (C(6) - 65) / 24
290  E = E * PI / 180: N = N * PI / 180: RETURN
```

HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

"—Ring out the old, ring in the new,
Ring out the false, ring in the True—"

This is how Tennyson, the well known 19th century English poet described the coming of the new year.

In ancient Rome, the first day of the year honoured the god Janus. The month of January derives its name from him. Janus was the god of gates and doors, and of the beginnings and endings. He had two faces; he looked back into the past and forward into the future.

Modern men and women follow this path and by looking back into last year's mistakes, omissions, failures, shortcomings, lack of success and non-performance of our duties, we make a "New Year's Resolution" to do things differently and better in the future.

We radio amateurs should make also our "resolutions". I am listing a few here, which I think we all should follow:

1.) We will try to be friendly on the bands, assist and co-operate with others. Before we use a particular frequency, we will listen, and we will make sure - by asking - whether it is occupied or not?
2.) We will try to be considerate to other amateurs on the band, and we will not disturb the enjoyment of others. We will not QRM, either accidentally or deliberately any amateur activity on the band, whether that of an individual or a particular group.
3.) We will try to be well informed in all radio amateur matters. We will not interrupt a QSO or a pile-up, by asking "what country is that?", but we will study beforehand the table of international prefixes.
4.) We will try to revise our own operating procedures, with the view of bettering same. We will collect our QSL cards from the distribution centres and will reply to them. We will learn how to use our two VFO,s and frequency memories on our transmitter, to prevent us from blundering in a rare DX pile-up.
5.) We will try to be a better, more loyal, more understanding, more knowledgeable, more tolerant and less prejudiced radio amateur, and by becoming one, we will be a better and much happier person to the benefit of ourselves and to all those around us.

Hungarian South Pacific Wanderings

Ele HA9RE and Miki HA8XX have been in the Pacific area since 22 December. First operation was from Chatham Island (ZL 7) with the callsigns: ZL0AAD and ZL0ADN. Next step is the Niue Island group where the callsigns: ZK2XA and ZK2XB will be used. February will see them on the South Cook

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D-3350

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Islands.

HA9RE wanted to include the Kermadec (ZL8) island group in his plans. He has permission to land there, but because of the present world oil crisis, he had to abandon this leg of his expedition. The charter costs of a boat from New Zealand to Kermadec and back have escalated to US$30,000, and they don't have that sort of money at their disposal. The expedition has been financed by the two amateurs themselves by borrowing money from every possible source. The organizing of their trip took one and a half years. I will pass further information to you as it comes to hand.

Incidentally, if you are wondering why you did not hear Tai ZL7TZ recently (who was a resident amateur on Chatham Island) the answer is simple. Tai's contract as a resident postmaster has expired. He returned to New Zealand, and the new Postmaster is not an amateur.

Rick 7P8EB and his XYL Mary 7P8DF in their shack in Lesotho

Western Samoa – 5W1

Pieter 5W1KT advises me that his contract has expired, and he intends to return to his home state Western Australia in January. Piet was quite a good DXer. He was to be found on 20,15,10, and 6 metres, and lately he was active on RTTY, AMTOR and Packet. Piet writes "I have been lucky to come here and work DX and try some new bands and modes. I will certainly miss being a rare DX. It is one of the nicest experiences, although it can also wear one down. The QSLing has certainly been a massive task". Thank you Piet for your willingness to give a new country to the HF user of the band. We wish you good luck in the future.

Lesotho - 7P8

On the occasion of receiving my QSL card, (his first one from VK) Rick 7P8EB sent me the photograph shown on this page, and a few lines about himself and family. Rick and his wife Mary are both from the USA. They were in Africa until 1979, and in Lesotho since 1984 with a missionary group. Rick is an electrical engineer by profession. Both he and his wife gained their Lesotho licences in mid 1989; Rick as 7P8EB and Mary as 7P8DF. There are only six active amateurs in Lesotho, and Rick enjoys being a rare DX. They plan to stay in Lesotho for at least five more years. Both are active mostly on 20-15-10 m bands. Try to work them.

San Felix - CE0/XQ0X

Early in November the unconfirmed news indicated that Ambrosia Island, which is a member of the San Felix Island group, will be activated by John CE0ZAM. Those in the know said that he activity will be for three to five months. Scientific research is being undertaken into the lobster population in the waters around the island. John's English is limited, and his DX experience is somewhat restricted. Therefore expect to find him on the various DX nets: 14160 -14222-14236- and 14226. He was supposed to start on 15 November, but it was announced at the end of that month that the expedition has been slightly delayed. John's callsign is XQ0X. By the time you read this he should be on the bands. QSL to : CE3ESS : Mickey Gelerstein, PO Box 9834, Santiago, Chile.

Mt Athos - SV/A

Athos means "mountain" in Greek and it is the "Holy Mountain" of the Orthodox Church. The mountain is situated near Thessalonika in Greece. This territory of about 75 sq kms of mountain area rising to little over 2000 metres above the Aegean Sea, is the site of a religious community of monks founded in the latter part of the ninth century. This community was under the sovereignty of the Byzantine Emperors, but later it was ruled by the Turks. In 1912 the area was occupied by the Greeks, and in 1926 the Greek Government recognized the community as a theocratic republic. Theocracy is a system of government by priests claiming a divine commission where God is recognized as a supreme civil ruler. The council of Government has four members and an assembly of 20 members. The community has its own police, but no women or female animals are allowed on its territory.

Radio amateurs seldom get permission to operate from Mt Athos, which is a separate recognized DX country. At the end of November, there was great activity on various bands and nets. Nikos SV2RE/A and George SV2UA/A were very active, and quite a number of VK/ZLs have worked them as a new country. QSL to home address: SV2RE/A: Nikolaos Georgiadis, Egnatia 108, GR-54622 Thessalonika Greece. SV2UA/A: George Tsalios, Erythrou Stavrov 7A, Votsi, GR-55134, Thessalonika Greece.

Malpelo Island - HK0TU

This was a very successful and well disciplined operation from this tiny rock in the Pacific Ocean (3° 59 N and 81° 34 W) about 448 kms west of the coast of Colombia. Malpelo is an uninhabited rock, rising to some 400 metres above sea level. It is about 1600 metres long and about 800 metres wide. This inhospitable rock was invaded for five days by 20 Colombian radio operators in the first week of November. According to Marco HK4CYR one of the antennas fell into the sea, and it took the expedition 12 hours to fix up a new antenna at 375 metres above sea level. HK0TU had a very good signal into VK/ZL most of the time at S 7/8 in Sydney, and quite a number of VKs worked this rare DX Country. QSL to: HK3DDD: Edilberto Rojas M, Box 25827 Bogota 1, Colombia, South America.

Interesting QSOs and QSL Information

Note:callsign-name-frequency-mode-UTC-Month of QSO. ADAR=QSL info in previous issues of "AR".

***UM2Q/UA90-21027-CW-0610-QSL via UA90J via Bureau.

***7X3DA-Hamid-21025-CW-9640-QSL via Bureau.

***ZX8CW-14017-CW-0700. QSL via:PT7AA;Pergentino Ide Andrade, Rua Osorio De Paiva 25,-69000 Fortaleza, CE. Brazil.

***V63BD-21026-CW-0600-QSL via VE3JDO John R Brummell.

11 Beechfern Dr, Box 880, Stittsville, Ontario, KOA 3GO, Canada.

***T33X—Baldur-28025-2330-QSL via DJ6SI Baldur Drobnica, Zedernweg 6, D-5010, Bergheim, Germany (SASE Direct only).

***V73BX-Baldur-21024-CW-0400 - QSL via DJ6SI (as above).

CE0LJ1-Ricardo-14198-SSB-1012-Nov-QSL c/o Hosbital, Easter Island, Chile.

***CE0DFL —Marco-14222-SSB-0623-Nov-QSL to Box 7, Easter Island.

***T20AA-Ian-21283-SSB-0410-Nov-QSL to N4FJL Thomas G Schrenkengost, 8 W Pine Tree Ave, Lake North, FL 33463, USA.

***YJ8CW-Colin-21303-SSB-0425-Nov-QSL to Box 342, Port Vila, Vanuatu.

***CE0ZZZ-Juan-14195-SSB-1053- Nov-QSL to CE3BFZ, Pedro A Barosso, Box 13312 Santiago Chile.

***VP8CEG—Tony-21300-SSB-0656-Nov-QSL to G1NAN AJ Gaterey, 2 Langmere Road, Watton, Thetford, Norfolk, IP25 6LG, UK.

***7J6AAK-Zbig(VK2EKY)-14222-SSB-0606-Nov-QSL to WA3HUP ADAR.

***9M2ZA-Zainal-14040-CW-1031-Nov-QSL via the Bureau.

***8J9UFO-Ryo-14030-CW-1031-Nov-QSL via JARL Bureau.

***9M600 Bob-14025-CW-2114-Nov-QSL-to N200 Box 45 Tuckerton, NJ 08087, USA.

***C6ACN-Phillip-14226-SSB-1214-Nov_QSL to PO Box GT 2318, Nassau, Bahamas.

***SU1FN-Fathy-14220-SSB-0628-Nov-QSL to Fathy Anwar Abdul Fattah, 17 Shahied Mahmoud Fouad St Heliopolis Cairo Egypt.

***V63AO-Nishi-(formerly KC6IN)-28520-SSB-0436-Nov-QSL to Box 296, Ponape, East Carolines, Micronesia.

RTTY News

Here is a selection of DX as supplied by Syd VK2SG:

***ZD7JAM-28087-1322Z-JOTA activity-QSL to Box 54 St Helena Island.

***3DA0BX-21082-1811Z-QSL to Box 57, Big Bend, Swaziland, Africa.

***VP8BFH-14080-0340Z-QSL to Box 60, Port Stanley, Falkland Islands.

***CN8YP-28092-1492Z-QSL to FDXF or F6FYP.

***CN2JF-14086 -0127Z-QSL to WA0RJY ***J73WA-21085-0045Z-QSL to Wayne Abraham, 1430 Rodney St, Porthsmouth, Commonwealth of Dominica, West Indies. ***CN15AMV-28085-1130Z-QSL to Box 299-Rabat-Morocco. *** HC8VB-14084-0427Z-QSL toDiego, San Cristobal, Galapagos Is via Ecuador. ***0X3EW-14086-0121Z-Box 1308, APO NY, 09023W, USA. ***V51P-21084-2141Z-Box 9080, Windhoek, Namibia, Africa. ***VP8BFA-21088-0215Z. ***P29BT-21087-2230Z-QSL to N5FTR. ***PJ2/OH2BGD-14089-0109Z-QSL to OH2BGD.

From Here and There and Everywhere

***Albert, VK6UA informs me, that the list of net controllers of "SEANET" (See "AR" Nov 90) is not correct. There are now six active net controllers on 14320+/-QRM at 1200 UTC each day. VK6UA Albert -VK6XC Ben-HS0E Sombat-YB3BDL Linda (YL) - 9M6KT Mike - and HS0B Fred.

***Received the V51NAM QSL card. This was the Namibia Independence Station, which was on the air from 21 to 25 March 1990. Very nicely produced colour card, with a brief history of the country and an explanation of the symbolism of the new Namibian flag, which is also shown. The card was posted by the Ministry of Wildlife, Conservation and Tourism, PO Box 13348 Windhoek 9000 Namibia.

***The envelope sent to EL7X with QSL card and return postage on 9 June 1990 was returned unopened and untouched in November, with the notation in French, that the delivery of the letter is not possible at the moment. Nice way of saying that Liberia is involved in a civil war.

***Worked ZM6CA special event station in May 1990. The other day, a nice coloured award certificate arrived, bearing the serial no 3, to confirm that I contacted the station at the Waikato Lifestyle Conference.

***Victor ON6BV advises that he is QSL Manager for the following stations: 3X1SG, 3X1AU and 3X1AW. His address: Victor Ravyts, Free St 4, B1590,Bever BT, Belguim.

***If you do not get direct replies to your cards sent to:TA3B, TA3C, TA3D, and TA3F, try to send the cards via DL5YCQ. Some of the mail is not arriving at the Turkish QTHs.

***Jack T30JH said that he is leaving at the end of November to go to Bahrain: his call there will be A92JH. Jack said that, due to very heavy work commitments, he does not think he will be much on air. He will return at the end of January.

***KC4MJ has advised that he is not the QSL manager for John PA3CXC/ST0.

***There were two DXpeditions to Banaba T33. Shortly before the T33R and T33T team had arrived, Baldur, DJ6SI (T33X), Karl, DK2WV (T33WV), and Henry DJ6JC (T33C) made a quick unannounced operation between 4 and 8 November 1990.

*** The DXCC decided to delete East Germany (Y2-Y9) from the DXCC countries list as from 3 October 1990. Contacts with Y2-Y9 stations after that date count as Federal Republic of Germany. From 22 May 1990, both the two former Yemeni states (7O-4W) were deleted and replaced by the Republic of Yemen designation with the callsign: 7O. QSL cards to claim the new country must be submitted only after 1 March 1991.

***As from 1 October 1990, YJ8RN has a stateside QSL manager N9DRU.

***According to ZS6PBY Mozambique, C9 might be on the "air" as from 1 January 1991. There are nine operators in the country, and all applied for licences.

***Dieter TL8WD left the Central African Republic on 11 December.

***Jim VK9NS is quietly preparing for a future possible activity from Bangladesh.

***The Jarvis Island AH3C/KH5 QSL cards have arrived in VK/ZL. According to the well-produced colour card, they made 55000 contacts. A group photo of the expeditioners and the photo of the boat Makamalani is on one side, all the other information is on the other side.

***The well known DXer, Martti Lane OH2BH has written a book about his own DXpeditions. Almost 25 years of DX activity has produced a book of approximately 300 pages, and can be bought from KTE Publications, 2301 Canehill Ave, Long Beach, CA 90815 USA for $US29.95. This price includes handling and postage of $US 7.00.

***The Siam International DX Club was formed by a group of DX and Contest minded amateurs in Thailand. Thailand has now some 13000 licensed amateurs, mostly no-code two metre FM operators. About 30 amateurs who passed the special examinations are now allowed to have HF privileges.

***Life is getting more orderly in Lebanon. Within a week the following stations were heard: OD5AS, OD5IG(QSL to:OE5BJN) and OD5SK.

***Just received a letter from Todor LZ1HA. Todor apparently knows about our magazine "Amateur Radio" and the existence of this DX Column. Todor is trying to establish a "Bulgarian Speaking Net" on behalf of number of amateurs in Bulgaria. They are now looking for ex-Bulgarian amateurs in Australia and anywhere in the world, who still speak some Bulgarian. If you are one of those, or you know of a Bulgarian speaking VK amateur, please get in touch with LZ1HA: Todor Dikov, PO Box 603, 1000-Sofia, Bulgaria.

Interesting QSLs Received

Note: W=weeks, M=months, YRS=years, FM=from, MGR=manager,OP=operator.

Direct QSLs received :7P8EB (3W FM OP) ***VP8BXK 93W FM MGR) ***XT2BW (4W FM MGR) ***CP5LE(/W FM OP) ***5R8JD (4W FM MGR), ***S01A (7MO FM MGR), ***A61AD (5WFM MGR), ***3X1SG (6W FM MGR), ***A43XA (7MO FM OP), *** (V51NAM (10 MO FM MGR), ***CX1TTE (2MO FM OP) ***AH3C/KH5 (7MO FM MGR) ***9H*GGS (4MO FM OP).

Bureau QSLs received : None reported.

Thank You

Many thanks for the phone calls, notes, messages and get well cards sent to me on account of my recent illness. I am slowly recovering.

To all my helpers: Thank you! I appreciated very much the assistance received from the following: VK2DEJ, VK2QL, VK2EXX, VK2SG, VK2BQQ, VK5OH, VK4ZIP, VK4DA, VK5QW, VK6UA, VK9UA, VK9NS, ON6BV, T30JH, LZ1HA, 5W1KT, 7P8EB, and the DX bulletins: "QRZ SZ" and "The DX Bulletin".

Have a happy year. Good DX and 73.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

I must be getting old, like a lot of Morsiacs, because I think another year just ahot through, and they're seeming a lot shorter too. Just in case you glanced at last year's column, and have not yet done anything about it, I would like you to read a bit from Tony Smith's final Morse Report. That's right, the magazine has closed. It goes under the heading "No Squatters' Rights" and should really have been seen first in our Australian AR, not the English one.

"No Squatters' Rights

The Morse test is required by international regulations to protect official and emergency communications from interference, and no-one would dispute that this need is growing less, particularly with the planned demise of maritime Morse in the coming decade. However, the Morse community needs to give notice to all concerned that even if the Morse test is eventually abolished by international regulation, the CW frequencies are not up "for grabs".

There is already considerable intrusion into these frequencies and CW operators identifying such intruders are strongly advised to report them to the RSGB's Amateur Radio Observation Service and to their own EUCW Clubs before it becomes a question of squatters' rights.

It might be asked why a column devoted to encouraging Morse operating should spend so much time reporting the views of those who wish to see the role of CW in amateur radio diminished. The reason is that those who wish to achieve something are usually more active in expressing their views than those likely to be affected — who are often blissfully unaware of what is going on until it is too late. It is important, therefore, to publicise such discussions or comments, particularly when they originate from persons or bodies in positions of influence.

There is a need for the CW community to defend the mode vigorously when it is unfairly treated, whether this is owing to over-enthusiasm by its critics for their own point of view, or their lack of understanding of the true role of CW in worldwide amateur radio."

I sure wish I had written that! Tony puts into understandable words the reasons why I have been trying to stir up some Morsiac action over the past year or so. Why I was so annoyed because although a few clubs ran my proposal in their newsletters, the QRP Operator's Club flatly refused to run it. And why, when one does run off an idea, the critics' letters outnumber the supporters' by about 20 to one. Not to mention those who are indifferent but want to air their own ideas, but will not "run" them by themselves.

Books

Q & Z codebook reprinted

A reprint of the 82-page Morsum Magnificat Q & Z codebook, a comprehensive list of the Q-codes and Z-codes, including (one page) list of original Q-codes, dated 1912, is now available.

Codes no longer used are included in the listing, except where they conflict with later ones, and specific codes used by amateurs are also included, excepting those which conflict with official codes.

Copies are available from Dick Kraayveld PA3ALM, Merellaan 8, 3145 XE Maassluis, Netherlands, price (about) $A10, including postage.

Morsum Magnificat

Available from 8a Corfe View Road, Corfe Mullen, Wimborne, Dorset BH21 3LZ, England. Payment by Access, Visa, Mastercard, about $US14, so quote your card number and expiry date.

Introduction to Key Collecting, and Vibroplex Collector's Guide

Both by Tom French W1IMQ, available from Artifax Books, PO Box 88, Maynard, MA 01754, USA. (I hope to review them soon — stay tuned). Price for the Intro is $9.95, and for the guide, $14.95. Both plus $4.00 p&p each.

Other News

Many Victorian (not Queen Victorian) friends and amateurs will be pleased to hear that the Clive Burns Memorial trophy for the highest novice scorer in the CW section of our Novice Contest had a mention in Morsum Magnificat (number 17).

To celebrate the coming 200th anniversary of the birth of Samuel Morse, here are a couple of special awards available.

FOC Jubilee 1991 . . .

To commemorate the 200th anniversary of the birth of Samuel F B Morse, the First Class CW Operator's Club will hold a special jubilee activity period, using CW, throughout the world. It is not intended as a contest, but more of a celebration of Morse code and its use in world-wide communication.

It will commence on the weekend of 27/28 April 1991, the actual anniversary date. Morse was 80 years old at the time of his death so the requirement (task) for non-FOC members is to work as many FOC members as possible within the 40-day period.

Frequencies 1.8 to 28MHz (not WARC bands) CW only.

Exchange RST plus club initials, if appropriate.

Send your details and log sheets to Peter Miles G3KDB, PO Box 73, Litchfield, Staffs, England, by 5 July 1991.

An engraved paddle goes to the non-FOC member with the greatest number of FOC contacts within the 40-day period.

Worked EUCW Award . . .

From the European CW Association, for contracts made on or after 27 April 1991. This one has a fee of US$8, so if you want more details send me a SASE for the page of information.

Finally, a thought for the month . . .

According to Ohm, a duplication of voltage corresponds to a quadruplication of power. Thus if a station with 1000W output causes our S-meter to indicate S8 we would have:

1000W for S8	16W for S5
250W for S7	4W for S4
63W for S6	1W for S3

This also means that the station would only need 4kW for a full S9 report as received 99 per cent of the time!!! But who would want to try to operate in the same state, let alone having a neighbour running kW powers? ar

EMC REPORT

HANS RUCKERT VK2AOU EMC REPORTER
25 BERRILLE RD
BEVERLY HILLS 2209

. Amateur Radio vs Telephone

DJ1HP reports in CQ-DL 11/90 on the following EMC problem: Telecom-DL installed a dual telephone in his neighbourhood with a PCM-Decoder. Both telephones were "affected" as soon as he started to transmit on 160m, 80m etc. The telephone wires in country areas are still running on overhead masts. The RFI-Testing Service of Oldenburg demanded at first that he had to stop causing the "interference", which would have been the end of his amateur radio activity. When he complained, pointing out that the problem is not at all a case of "interference" but the result of a totally "insufficient immunity" of the PCM-Decoder to legally transmitted RF signals, the Telecom-EMC manager Mr Hohn investigated the case himself and confirmed DJ1HP's opin-

ion. Screening and installing chokes at the decoder had no effect. DJ1HP agreed to avoid transmitting during some important business hours of his neighbour. A Telecom work team arrived a few weeks later, digging a trench, placing the telephone cable underground over a distance of several hundred metres. Also the cable to the house and inside was now shielded. This correct action solved the problem without bureaucracy or a legal fight, which would not have solved anything, except the earnings of the solicitor would have been increased. All concerned were now happy.

2. 430-440MHz amateur band plus mobile telephone service:

The DARC submitted a number of questions to the Federal German Minister for Postal Services, Dr C Schwarz-Schilling, and one question was about possible EMC problems, which may arise when the two services wish to use the 70cm band. The minister stated: "The question of subdividing this frequency band will always be discussed with the DARC, but no decision will be made in the next five years! What will be the situation in other countries?

3. RFI from photo-electric night-light switch, VK3CIS reporting:

The Taiwan-made device caused severe interference throughout the house, operating an incandescent globe. There is no warning to this effect on the package. (The interference caused by fluorescent lights is well known, but some packaging has at least a warning). The interference-causing device was returned to the dealer with an explanatory letter and a refund was requested. I now am using a photo-electric light switch "Type KD-90" made in Hong Kong, which does not cause any interference to nearby TV, VCR and Hi-Fi radio. It can be done! The bad device should not have been imported. The electrical safety test, carried out by our authority, should include a RFI test as well. That goes for computers as well.

4. "Radio Communication" October 1990 (RSGB) submitted by Norm Burton

a) EMC Standards update:

G4JKS describes the EMC Standards as they exist in the UK and, as far as they affect amateur radio, for example the 150kHz to 150MHz range (BS905 part 2,2985). The European Common Market Standard EN55020 is likely to be adopted by 1992. The susceptibility fieldstrength (test cell test) will be 125dBuV/m, (1.78 V/m) for radio and TV receivers — DL has now a limit of 3 V/m. It should not be that critical! Radio amateur experts (see earlier EMC Report) have shown that 10 V/m would be a more realistic and acceptable value. Some manufacturers have achieved immunity even at 50 V/m (tested by DL1BU).

b) Computer immunity is covered by a draft standard "pr EN 55101-3", and the test is to cover 30MHz to 1GHz.

c) Some manufacturers didn't want immunity standards at all, arguing that this was a "quality" aspect of their product. Sure enough, immunity to unwanted but legally transmitted RF signals is the one quality aspect we radio amateurs consider as absolutely vital.

d) G4JKS describes other EMC problems and draft standards: broad-band interference; quasi-peak detector; narrow-band interference; TV 15.625kHz line oscillator interference; household appliances; computers etc. ar

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

Firstly, my best wishes for the festive season to all readers, and may 1991 be a year of success and achievement for all in both personal and radio fields, and world peace.

I have on my desk a letter seeking my support for a submission for funding for a project aimed at introducing amateur radio to a specific community group. I have over the years seen or helped with the preparation of a number of these submissions. Some of them have been successful, and have resulted in the project being funded. The failures have sometimes been because of inadequate preparation of the submission, sometimes because of lack of vision on the part of those allocating the funds.

Each appeal — for funds, for use of facilities, for frequency privileges, whatever — must justify the request by enumerating the benefits of amateur radio to the community, the particular group, or the individual. We usually talk of "a pool of trained personnel", "technological experimentation", "state-of-the-art electronics", "help in civil emergencies" or "knowledge and skills". We imply, whether intentionally or not, that every amateur is using the latest and best technical equipment, which is naturally home built and maintained, solely for experimental purposes.

The term "black box operator" tends to be used condescendingly and derogatively, as if these operators are second-class amateurs. Let me at the start of a new year appeal for tolerance and forbearance towards other amateurs' preferences. There are so many facets to our hobby these days, that we tend to forget about those whose interests differ.

There is still a place among our ranks for those who just like talking to other amateurs, and meeting people half a nation or half a world away. It may even be that these people are the ones adhering most closely to the amateur radio ideals of friendliness, consideration and patriotism. The talkers have the potential to contribute more to national and international understanding and world peace than any other group. Where else but in amateur radio can an ordinary citizen of one nation talk unhindered to a counterpart in almost any other country in the world? Goodwill and friendship between nations grows from understanding between the citizens as well as between the leaders.

When I write my piece to back this submission, I will stress the value of personal contacts and international friendships as well as the localised and technological benefits. I wonder if it will affect the success of the submission if I also say that amateur radio is fun. ar

WARC-92 UPDATE

DAVID WARDLAW VK3ADW
WIA WARC COORDINATOR

Preparation for WARC-92 is proceeding at an increasing pace, with several of the CCIR Interim Working Parties which are scheduled to provide input to the CCIR Joint Interim Working Party for WARC92 already having met. One of these IWP 8/14 was held in Melbourne during August. This IWP dealt with the mobile satellite service and, amongst other things, was concerned with Low Earth Orbit satellites which in the mobile service are seeking up to 5MHz of frequency below 1GHz.

Although the CCIR cannot specify an allocation, it can point at certain parts of the spectrum. At the moment the USA is looking at frequencies on either side of the 144MHz band for a mobile satellite allocation.

Another problem addressed by the IWP was potential interference to the COSPAS SARSAT search and rescue satellites on 406MHz, by wind profile radars operating on the adjacent Meteorological Aids band. It is accepted that the wind profilers will have to be moved, and it is possible that the 78cm band which we share with Radiolocation may be considered. The dangers to the amateur satellite service have been emphasised, and the amateur service's concern expressed at the WARC preparatory meetings.

HF Broadcasting expansion is a complex subject. As to date the new bands allocated at WARC 79 have not been planned, but all the same they are being occupied by HF Broadcasting stations.

JIWP 10, 6, 8, 9/1, which have just met, dealt with inter-service compatibility and sharing on HF. The IARU submitted a paper to this JIWP, parts of which have been incorporated in the report of the working party to JIWP WARC-92, which is the working party preparing the technical basis for WARC-92 on behalf of the CCIR. Also endorsed in the report was the fact that HF Broadcasting must move to SSB, and that the suggested date must not be allowed to slip any further.

The FCC in the USA has put out its Second Notice of Inquiry calling for comment on its draft proposals for WARC-92.

One proposal of great interest to the amateur service throughout the world is a change to the 40m band. The FCC proposes a worldwide amateur band 6900kHz-7200kHz to enable HF Broadcasting to fit in within Region 2 and still not disadvantage the amateur service.

The FCC states that any changes to the Frequency Table will require a reasonable changeover period.

An area of concern to the amateur service is one of the FCC alternative proposals for Satellite Sound Broadcasting. This proposal is to use 2390-2450MHz, and to eliminate the 2400-2450MHz amateur satellite band. This is, of course, only one of their options for BSS (sound).

There is also a FCC proposal for 420-421MHz as a mobile satellite band limited to low earth orbit satellites.

The IARU has drafted a report to IWP8/15 which is concerning itself with mobile, amateur and radio determination matters above 30MHz. The IARU paper details sharing and operational characteristics of the amateur service and predicted future developments.

As far as the amateur service is concerned, the output from IWP 8/15, along with that from JIWP 10, 6, 8, 9/1 will be very important in the preparation of the CCIR technical report to WARC-92.

The WIA has decided to send a representative as a member of the Australian delegation to JIWP WARC-92, remembering the important part that the Special Preparatory Meeting of the CCIR played in influencing the final outcome of WARC-79, particularly for the amateur service. **ar**

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

A new year has arrived and already I am wondering will it be as momentous as 1990 has been. The Cold War finally was dead and buried as the Iron Curtain was torn away, allowing a completely free flow of information to go in both directions. New voices emerged and shortwave radio did indeed reflect these historic European events. One nation disappeared into the history books, along with its external broadcasting voice, on 3 October.

Will this year also throw up some surprises? The demise of the Cold War has brought into sharp focus the future of several US governmentally funded international broadcasters. Congressmen struggling to rein-in the huge Budget deficit have been seriously questioning the need to continue to fund Radio Free Europe and Radio Liberty, especially since the emergence of a free non-governmental broadcasting structure within Eastern Europe.

Yet, the continued viability of shortwave broadcasting was clearly demonstrated when the Iraqis invaded the tiny Gulf Emirate of Kuwait on 3 August. Thousands of expatriates were stranded as a result, and shortwave broadcasts became the sole means of communicating with them.

Perhaps we will see the major broadcasters specifically targeting those areas where a large listener audience to shortwave radio stations will exist in the future. These predominantly are in the Afro-Asian regions where there is limited access to television and/or other sophisticated electronic hardware. The average listener will still be using a cheap analogue multiband portable. Recent audience research in Latin America indicates a marked decline in levels there, as television replaces radio as the primary communications medium.

Audiences in the industrialised world have also seriously declined, leaving only expatriates or a handful of radio hobbyists, who often aren't that interested in the specific program content. That is why many broadcasters have been seriously investigating co-operative schemes whereby programs could be carried via local stations on AM or FM without the enormous cost incurred by erecting relay stations on shortwave.

Next year there will be a major international conference to decide the future of the electromagnetic spectrum. This will be held in Barcelona, Spain, and you will read elsewhere in this magazine why this is of vital importance to the amateur community. Although there has been pressure to dramatically increase the allocation to broadcasting, I would expect to see international HF broadcasting slowly decline as more efficient means of information delivery emerge.

Just a few weeks ago, I was scanning around the 42m allocation when I came across a well-known Australian DJ with "Classic Top 40 Countdown". My initial impression was that of a pirate station relaying a domestic AM station. Imagine my consternation and surprise when the station ID came around as the World Service of Radio Moscow. Glasnost indeed! The program had numerous flashbacks to events in Australia in the early '70s. The content was more Ocker than Russian. Apparently the DJ has entered into an agreement with the Radio Moscow organisation to carry this locally produced program. Tune in to Moscow on Friday nights and hear for yourselves. (That is, if they are still carrying it!)

Radio HCJB in Ecuador recently purchased several ISB senders from the Swiss PTT. These 30kW units have already been put into service with reduced carrier USB. There is one on 25950kHz using a vertical antenna. I have heard it occasionally during daylight hours, even in one instance as late as 1200 UTC. Recently, the second sender was brought into operation on 21455kHz. This is easily heard here in Australia, as they are feeding it into a rhombic that is directed to the South Pacific and Europe. Both of these operate around the clock and have become a good propagation guide. Reports are desired.

Well, that is my first column for 1991. If you have any news or comments, feel free to drop me a line to the above address, or via packet, to VK7RH@VK7BE-1. Until next time, the very best of 73 and good listening! **ar**

RANDOM RADIATORS

RON FISHER VK3OM AND
RON COOK VK3AFW

The VK-Windom

We have had a number of articles about the Windom antenna but I think we have something new to add. The old-timers spoke highly of the Windom but, with the growing popularity of 50ohm output transmitters, antennas such as the Windom lost popularity in favour of antennas fed directly with coax. As time goes by I gain more respect for the old-timers and recently became convinced that the Windom perhaps did not deserve the bad name it appeared to have acquired. I therefore set out to analyse the antenna on a theoretical basis.

Firstly I wondered why the tapping point was claimed to give a good match on four bands. The reason can be deduced from Fig 1 which shows the current distribution on an 80m dipole at resonance on 80, 40, 20 and 10 metres. Only the left half is shown as the picture is symmetric about the 90° point. At a point equal to 60 electrical degrees in from the end (on 80m) the current amplitude is the same for even multiples of the fundamental frequency. It seems quite possible then that the resistance seen at that point will be similar on all these frequencies. The tap at the 1/3 point might have a good engineering base!

Next I ran the Windom through a computer program called MININEC3 which is a useful tool for analysing a wide range of antennas for feed impedance, gain and polar pattern. I used a 2mm diameter wire, 136ft long wire tapped at 44ft 4in from one end. The results are shown in Table 1.

Table 1

Windom Feed Impedance

Frequency MHz	Impedance Ohm
3.6	98 + j41
7.1	136 - j26
7.2	142 + j44
14.3	125 + j10
28.6	345 + j166

Free space calculated impedances. See text for details of dimensions.

By performing many calculations with slightly different frequencies the resonant frequency can be found. The real (resistive) component of the feed impedance will be within 10 per cent of the above values. For the lowest three bands the Windom has a feed resistance at resonance that averages 120 ohms roughly. No wonder the ARRL handbook says that the claimed feed resistance of 300 ohms is more wishful thinking than fact! However, on 10m the feed resistance at resonance is near 300 ohms. Radiation patterns are essentially as given in the standard handbooks for half, one, two and four wavelength dipoles.

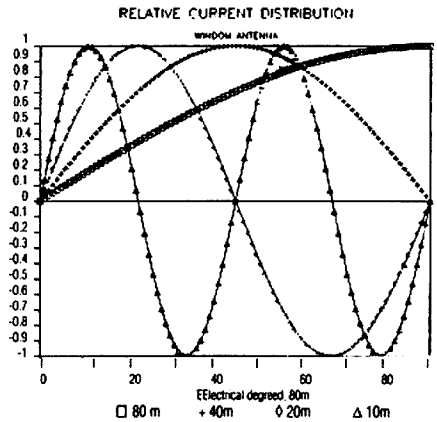


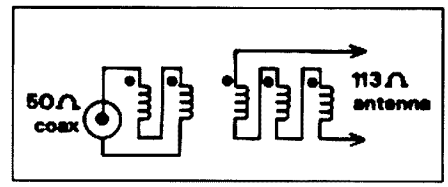
Figure 1. Relative Current Distribution. Windom antenna, one half only shown. 0 degrees corresponds to one end, 90 degrees to centre for fundamental resonance on 80m.

The next thought that occurred was that the lowest three bands could be reasonably well matched with a suitable balun but 10m would remain a problem. Suppose 80m was sacrificed by making the antenna half size resulting in a matched antenna for 40, 20 and 10m. The best match obtainable for a simple matching device comes close to the ideal ratio, transforming 50 ohms by a factor of 2.25:1 to 112.5 ohms. This would give about 1.2:1 VSWR on 40m and better than 1.1:1 on 20 and 10m. Coax feed and no ATU required!

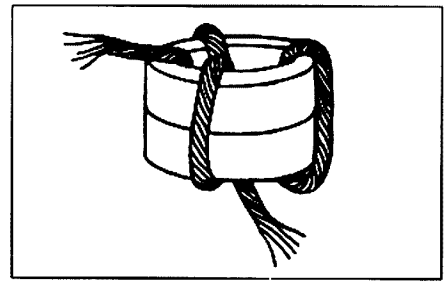
In spite of the rural image Australians have, very few live in the country on farms where the erection of large wire antennas is a trivial matter. Most of us live on small blocks, about five to the acre, and putting up an 80m dipole is often quite difficult. A smaller antenna is also desirable from the point of view of visual impact on the neighbours. Thus an antenna with a span of only 66ft has considerable attractions for VK amateurs, hence the name for this version of the Windom, the VK Windom.

To test the theory I built and tested a VK Windom, using 2mm diameter hard-drawn copper wire, 66ft long tapped at 22ft from one end. The insulators were obtained from Dick Smith.

The novel feature is the use of a 2.25:1 matching transformer instead of the 4:1 balun used (as we can now see incorrectly) for the Carolina Windom. (It should be noted that in some articles describing the Carolina Windom it is clearly stated that an ATU is required). I had intended to use a transmission line type balun but found that the desired ratio and balanced to unbalanced connection was apparently not possible with one core. It might be possible, but my reference (Transmission Line Transformers by Jerry Sevick (W2FMI) did not show me a suitable circuit and I could not work one out for myself. In the end I resorted to an RF transformer wound in a similar manner to a transmission line balun. I took five strands of single core, silver-plated teflon-insulated wire and twisted them together to make one cable. I wound this through two ferrite cores stacked together to form three turns. Two wires were connected in series for the 50 ohm side and the remaining three in series for the antenna side (113 ohms). The core material was a toroid, part number FC501, which was purchased from Stewart Electronics. The core was placed on a pad of roof and gutter sealant in a small diecast box. The coax was run in through a small hole at one end and two insulated wires through holes at the other. After soldering to the transformer more sealant was used to waterproof the box. The lid was screwed on and coaxial connector sealant used to seal the screw holes and lid edge. The two wires were then soldered to the antenna. See fig 2.



(a) Transformer wiring



(b) Three turn x 5 wire winding on two FC501 cores

Figure 2. Matching Transformer. This RF transformer gives a resistance ratio of 2.25:1 and is effective from less than 7 MHz to more than 30 MHz.

The antenna was suspended from my 40ft tower at the feed point and the ends run to the two side fences. The short end of the new antenna was almost vertical, not a feature that I had wanted but unavoidable given the physical limitations of my QTH. The VSWR was measured and found to agree well with predictions made from the computer program. The curves are shown in Figs 3, 4 and 5. The variations are partly due to inaccuracies in VSWR measurements and the limited resolution of the VSWR measurements. The antenna was fed through a 60ft length of RG58. It can be seen that the resonant frequencies are not exact multiples of the fundamental. This is due to the end effect, and means that mid-band resonance on 20m is achieved with

resonance on the low end of 40m. Fortunately, this combination fairly closely matches the high activity areas of the three bands.

Comparative tests were made with a G5RV wire antenna and a W8JK beam. On 40m the VK Windom performed as well as the G5RV. It was better for stations to the north, such as JAs, but not as good for stations off the end such as Ws. The differences did not exceed about one S unit and can be readily explained by differences in orientation of the two antennas. A similar result was obtained on 20m, but on 10m the VK Windom was superior in all directions, by about two S units into Europe, for example. It was almost as good as the beam in some directions.

So, if you need a cheap and easy-to-build antenna, suitable for suburban installation, not requiring an ATU yet providing both local and DX capability, coaxially fed, without awkward traps and with off-centre feed for restricted spaces, then the VK Windom is for you.

The disadvantage is the restriction to three bands as above or, if you have the room, 160, 80 and 40 with a double size Windom or 80, 40 and 20 for the standard size. All band operation is possible with open-wire feeder and a balanced ATU. Using a balun may not be possible on some bands.

Loose talk can cause trouble

Here is a letter from Peter VK3BWD, which is self-explanatory.

"Reference your RRs October 1990; specifically your comment on page 46: 'Whilst other designs such as log periodics may sport as many elements and offer a wide bandwidth, many exhibit no more than 6dBd gain (6dB over a dipole).

By the use of a little loose terminology you will have confused some readers about the difference between the Log Periodic Dipole Array (LPDA) and the Log Yagi and by some further confusion of the gain bandwidths re-

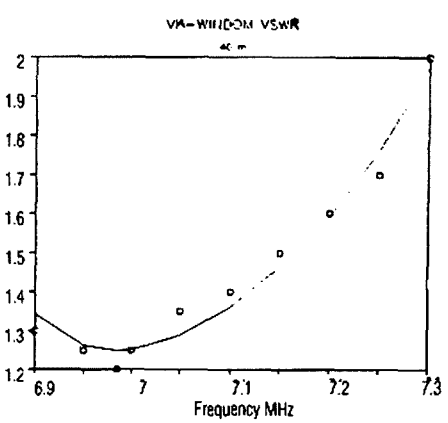


Figure 3. VK-Windom VSWR, 40m. The reonant frequency is just below the amateur band but no ATU is required up to about 7.15 MHz. Calculated VSWR at resonance is 1.2:1

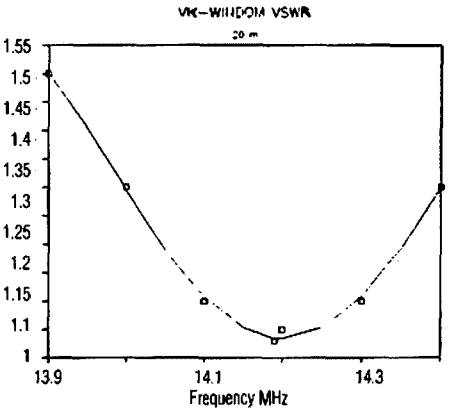


Figure 4. VK-Windom VSWR, 20m. The resonant frequency is about 14.2MHz and the VSWR is sufficiently low across the whold band for an ATU nor to be required. Calculated VSWR is less than 1.1:1 at resonance.

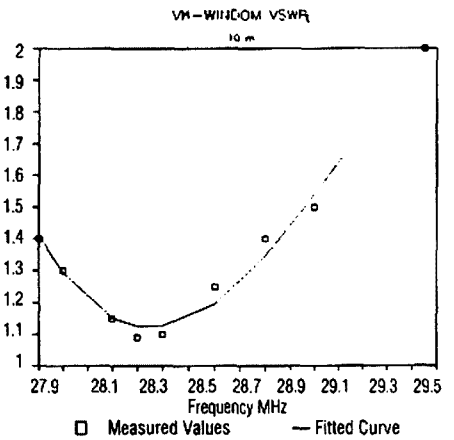


Figure 5. VK-Windom VSWR, 10m. The resonant frequency is abut 28.35 MHz and operation up to about 28.8 MHz is possible without an ATU. Calculated VSWR at resonance is less than 1.1:1.

lationships for these two classes of antenna you give a quite wrong impression of the comparative gain figures for Monoband Yagi, Log Yagi and LPDA.

Like the study you quote, Lawson[1] and Viezbicke[2] have established the number, taper and spacing of elements for various design objectives. Lawson in particular established that the necessary, if not sufficient, condition for optimum forward gain is a long boom-length which now distinguishes a class of Yagis. To quote him: "The simplistic design is as good as any design for boomlengths less than one wavelength."

Now the gain conditions you attribute to log periodics (sic) are characteristic of LPDAs of moderate boomlength and huge bandwidth, which makes their introduction to the discussion of 50MHz long-boom monobanders curiously irrelevant.

In the case of the LPDA, the gain will depend on the number of elements in the active region and whether the design has more than one active region over the operating frequency band. Gain will be a complex function of taper and spacing parameter which set the boomlength and number of elements, but have to be chosen to maintain the backfire condition of the antenna over the operating bandwidth as well as provide a practical mechanical design.

In Rhodes'[3] Log Yagi design, the log cell contributes intrinsic gain as do the parasitic elements. In a sense this is incidental to the purpose of the log cell, which is to increase the frequency over which the pattern, forward gain, FTB ratio and input impedance are essentially stable. The combined gain of the cell and parasitics is a complex function, not entirely characteristic of Yagi spacings nor of LPDA taper and spacing. The published studies of the log Yagis by Rhodes and Johnson[4] have not yielded any convincing algorithms for calculating forward gain. Johnson estimates that the gains from a single director and reflector at around 4 to 4.5dB over the log cell which, in the usual three or four-element configuration, he estimates contributes around 6dBd. Rhodes claimed the gains for the compact Log Yagis were comparable with many monoband Yagis and that the incremental gains from additional parasitics followed those for Yagis. He felt these gain improvements were of marginal utility measured against the loss of the compact form.

KLM sells Log Yagis based on Rhodes' design for HF and VHF including the following examples for 6m. Whilst I treat manufacturers' claims for gain with some scepticism, I think the following examples from the KLM catalogue make useful comparison with the optimised Yagi design quoted in your Table 1. [AR p46].

I think we can say that the bulk of evidence suggests that this particular form of log periodic illustrated by the KLM 50-52-8 is not as much as 5dBd down on an optimised Yagi such as the nine-element one in Table 1 [AR p46]. I think this applies whether we consider forward gain at the centre frequency, gain over the operating bandwidth or even the front-to-back gain.

KLM 50-51-5
Five elements
Gain 9.7dBd
FTB 30dB typical
Boom length 11.7ft (3.59m)

KLM 50-52-8
Eight elements
Gain 12dBd
FTB 30dB
Boom length 18.25ft (5.57m)

KLM 50-52-11
11 elements
Gain 14dBd
FTB 30dB
Boom length 30ft (9.16m).

I am not at all sure why anyone would wish to make a monoband LPDA to cover a band-

width as narrow as 2MHz at 50MHz, bearing in mind the mechanical complication involved. However, for B=Fh/Fl=1 using gain optimum spacing and taper the following element versus gain table results:

N	l/λ	Bs	dBd
4	0.34	2.02	5.9
5	0.52	1.67	7.0
6	0.73	1.52	8.0
7	0.91	1.39	8.9
8	1.12	1.30	9.7
9	1.33	1.26	10.2
10	1.48	1.22	10.6

N= number of elements
dBd = directivity gain over dipole
l/λ = array length in wavelengths
Bs - structure bandwidth where Bs = Bar x B and
Bar = bandwidth of active region.

This table is abridged from a shortened design algorithm due to Scholz & Smith[5], but I have run the eight and 10-element design figures through Carrel's[6] computations and they check out for the number of elements and approximate gain.

I reiterate I cannot conceive why anybody would build a nine-element LPDA more than 8m long to achieve a frequency independent bandwidth of this sort for the 6m band, but the evidence suggests that if they did they would not be 5dBd short of the Table 1 Yagi. More importantly, the table above suggests that, by the time directors and a reflector are added to a four-element log cell, it might be very difficult to build a log Yagi having only 6dBd gain. [If it were desired to have a beamwidth where the 3dB points were at 3dB it might be better to unhitch one side of the coax].

The beauty of the Log Yagi and the popularity of the KLM variant for all amateur bands lies in the compromise which it achieves. Mechanical complexity intermediate between the LPDA and the through-the-boom Yagi. Comparable gain to all but optimised Yagis with a greater bandwidth for stable pattern, gain and input impedance [and black box to boot!]

Let me summarise with an argument as loose as your own.

The only time a log periodic needs to have a gain of 6dBd or less is when it has to fit an amateur's wallet.

References

(1) Lawson James, Yagi Antenna Design, Book, ARRL.
(2) Viezbicke P, Yagi Antenna Design, NBS Tech Note 688.
(3) Rhodes P, Cross a Yagi with an LPDA, QST Dec 1976.
(4) Johnson Leo D, Log Yagis Simplified, Ham Radio, May 1983.
(5) Scholz, P A & Smith G E, Log Periodic Antenna Design, Ham Radio, Dec, 1979.
(6) Carrell, R. The Design of Log Periodic Dipole Antennas, 1961 IRE International Convention Records S Pt 1 Ant & Prop pp61-75.

In my (Ron#2) defence, I suggest that while in the USA where the term "Log Periodic Dipole Array" is in wide use, L A Moxon G6XN, well-known author of many articles on antennas, uses the term "log periodic' in his book "HF Antennas for all Locations", in the same sense as I used it in the offending article. I accept that the correct description is Log Periodic Dipole Array (LPDA) and apologise to any readers confused by my article. I had in mind an antenna covering a three-to-one bandwidth from roughly 50 to 150MHz with a boom of moderate length. Such an antenna usually has no more than three elements contributing on any one frequency. It is equivalent to a great many three-element beams and is an excellent arrangement if a wide bandwidth is required and both HF and VHF versions are commercially available.

I do not consider 2MHz at 50MHz to be a particularly wide bandwidth, nor do I consider the Yagi designs with broadband multi-element drivers to be log periodic antennas in the strict sense as they do not have a repetitive (periodic) structure. A Yagi with an elaborate feed is still a Yagi. (The purist will argue that the Americans got it wrong and it should be called a Uda after its inventor, but that's another story). It is generally true that a Yagi will have a gain related to its boom length regardless of the feed arrangement. The Log Yagi was called the Swan Yagi back 20 years ago when ATN Antennas first started making them. However, I will try to remember to call them Log Yagis in the future.

Contrary to Peter's belief, I was not advocating the use of a LPDA as a narrow-band antenna. While Lawson's computer analysis shows that good performance can be obtained with straightforward design for short-boom lengths, the thrust of the DL6WU work was to overcome the problem encountered in practice of gain falling as boom length was increased. While Yagis with up to six or seven elements can be designed readily and achieve good performance, the design of Yagis with gains above about 10dBd has been dependent upon much cut and try for optimisation. I well remember witnessing tests on one long-boom Log Yagi that had as much gain when half the boom was removed as when it was full length.

DL6WU has devised a design process which allows very long Yagis to be built from the paper design and achieve the anticipated performance without adjustment. Some stations are working moonbounce with a single DL6WU Yagi!

The gain figures quoted for the KLM Yagis are about 2dB higher than Lawson's theoretical maximum gain and the Front to Back (FtB) figures are not supported by his analysis. However, the benefits of these antennas are as stated by Peter, good gain and FtB with a low VSWR right across the band.

To conclude, firstly equating my "log periodic" to a wide bandwidth LPDA will avoid most confusion. Secondly, I do not consider a Log Yagi to be a true "log periodic". Thirdly, the construction of long-boom high-performance Yagis using a theoretical design procedure had not been particularly successful until the DL6WU design data were derived. All successful long-boom Yagis were the result of extensive experimental work after an initial "stab" using a theoretical design. By long-boom Yagi I mean one with a boom exceeding two wavelengths, something which is only practical for most people at VHF and UHF in particular. For booms of less than one wavelength then, the Lawson approach would be fine. There is room for argument over the approach to be used in between.

The points that I wanted to make in the offending article were these: A high-gain antenna requires a long boom and the Yagi is, in my opinion, the best option. The bandwidth of a LPDA is traded off against gain. A three-octave bandwidth and moderate boom length are incompatible with high gain.

While an LPDA could be constructed as a monoband antenna on a long boom and give gain close to that of a Yagi with the same boomlength, the construction of a Yagi is so much easier that there seems little point in considering an LPDA for such an application. The use of a few LPDA elements to replace a single-folded dipole feed can result in a considerably greater VSWR bandwidth with little effect on gain.

Lastly, of late my pocket seems to have been subject to considerable attenuation and achieving a gain of more than 6dBd at HF is for the present out of reach. Thanks for raising several interesting points, Peter.

73 FROM ME AND 73 FROM HIM

ar

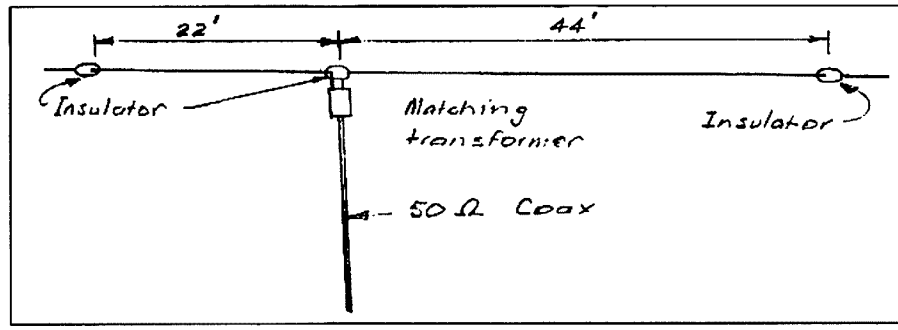


Figure 6. Schematic Drawing of VK-Windom. The radiator is 2mm diameter H.D. copper wire.

ALARA

JENNY ADAMS VK3MDR
70 KANGAROO GROUND RD WATTLE GLEN 3096

Last month it was Seasons Greetings; this month I would like to wish you all a happy and peaceful New Year. Deadlines so dictate that at the time of writing we have not yet celebrated Christmas, but will well and truly have done so by the time you are reading this. So much for trivia.

Ladies, why not join us on our Monday night net? 3580 +/- QRM UTC 1030 except during daylight saving (from last Monday in October to second Monday in March 1991) 1000 UTC. If you haven't got a licence as yet, just convince a licensed member of the family to do some work in the shack during the net time. There is one YL who does this. You would all be most welcome.

While we are on the subject of nets, here is a list of other YL nets.

YLDX net "222" is held on Mondays 14.222 0600 UTC.

Bev VK6DE would like to chat to YLs on Fridays on 21.1888 0400 UTC. Poppy VK6YF conducts the VK6 ALARA/YL net on Mondays 3585 +/- 1200 UTC (after the National ALARA net).

Congratulations to Dorothy VK2DDB, our new VK2 representative. Here is a list of our other state representatives:

VK3 Bron VK3DYF
VK4 Margaret VK4AOE
VK5/8 Maria VK5BMT
VK6 Poppy VK6YF
VK7 Helene VK7HD

Please contact them if you would like any information regarding the Australian Ladies Amateur Radio Association, including membership, which for any VK is $8.00 per year.

During the past week I received yet another letter with a suggestion on how to stop feathered aerialists using beams as landing strips. Thank you to Selwyn . . . The idea he proposes is not his own. He believes he saw it in a book review in an electronic magazine. The book may have been "Hints and Kinks" (from articles which have appeared in QST).

The hint said to cover the elements with pieces of electrical conduit (plastic) When the bird lands, the conduit rotates and the bird goes elsewhere.

That is all the review said. I guess it would be better to cover the elements with a lot of small pieces rather than one large bit. You would have to have some sort of disc to prevent the pieces working their way off the end of the element. For the boom, pieces of plastic water pipe could be used (but keep in mind the antenna tuning will be affected). 73,33 ar

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074
PACKET: VK5EA@VK5WI

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday Bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064 MHz
(7.064 MHz is the frequency presently in use)
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 on some WIA Divisional Broadcasts.

AMSAT Australia newsletter and computer software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has over 310 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box 2141, Adelaide 5001.

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham.

PACSAT Data Specification Standards

Harold E Price, NK6K and Jeff Ward, G0/K8KA

Abstract

This document provides a standard way of describing PACSAT data formats in specifications, and provides certain assumptions for implementers.

Purpose

This document describes the standard format for PACSAT data.

Background

This standard is based on the following assumptions:

1) The spacecraft are the critical resources in the PACSAT/ground station network. If a particular data representation can conserve memory space and CPU cycles in the spacecraft, all other items being equal, the representation that favours the spacecraft should take precedence.

2) The UoSAT and the AMSAT-NA PACSAT hardware are based on an Intel 80186-compatible device. Therefore, all internal multi-byte numeric data is stored with the least-significant byte in low-order memory.

3) The UoSAT and the AMSAT-NA PACSAT software is largely based on the Microsoft C programming language.

4) The UoSAT and the AMSAT-NA PACSAT software development systems are based on IBM PCs or compatibles.

Discussion

The primary decision to be made in PACSAT data formats is "big endian" (BE) vs. "little endian" (LE). Most network standards are defined as BE, meaning the Most Significant Byte (MSB) of multi-byte data appears in low order address space, and the Least Significant Byte (LSB) appear in high order memory. The UoSAT and Microsat spacecraft all use Intel 80186 or compatible CPUs , which store data with the LSB first, and are LE.

Multi-byte data appears in many places in PACSAT data, including the file headers and the control structures of the broadcast and FTLO protocols. If these protocols were BE, the spacecraft would need to swap byte order in several places. Whether done as in-line code or as function calls, these conversions use both CPU cycles and code space. It is clear that a native data representation will result in a more efficient utilization of the spacecraft CPU, and that the data format conversions, if any, should be done on the ground. Experimentation was done showing that avoiding byte swapping on the spacecraft resulted in significant space savings.

This will not affect the actual high-level software code, as prudent programmers who wish to write transportable code that is applicable to BE and LE hosts will use macro calls to swap the byte order when moving data from

an external source to local variables. By using the somewhat less common LE in the protocol specification, the macro will be active on BE systems when it would normally be active on LE systems. In any case, the macros would still be present in the source file.

For example,

fnum = NETSWAP32(broadcast-head.fnum);

would be the line of code to read in the file number from a broadcast protocol frame. This code will be the same no matter which order the protocol required the 4-byte integer field to be in.

Taking these assumptions into account, the standard to be used when defining data exchange formats between PACSAT and a ground station are as defined below.

Intended Applicability

This document is primarily intended to apply to shared file formats, such as the standard PACSAT File Header; and to PACSAT specific protocols such as the PACSAT Broadcast Protocol. It is not meant to infer that existing protocols, such as IP, are to have integers byte-swapped when transmitted to a PACSAT.

PACSAT Data Structure Specification Standard.

1) All structure definitions in PACSAT standards documents should provide C structures wherever possible to describe data formats.
2) All structures are assumed to be packed; do not assume slack bytes are provided to align words and double words.
3) All multi-byte numeric data is assumed to be stored and transmitted with the Least Significant Byte first.
4) Where it is necessary to number bits, the least significant bit is zero.
5) The standard method for referring to hexadecimal constants will be the C standard Oxhh.
6) The assumed length of an unsigned or int type is 16 bits.
7) The "left" end of a string is stored and transmitted first.
8) "ASCII" characters are the printable ASCII characters 0x20-0x7f.
9) Times are represented by the UNIX 4-byte unsigned integer counting the number of seconds since 0000 UTC 1 January, 1970.

HR AMSAT NEWS SERVICE BULLETIN 321.04 FROM AMSAT HQ

SATELLITE ACTIVITY FOR AUGUST/SEPTEMBER 1990

1. Launches

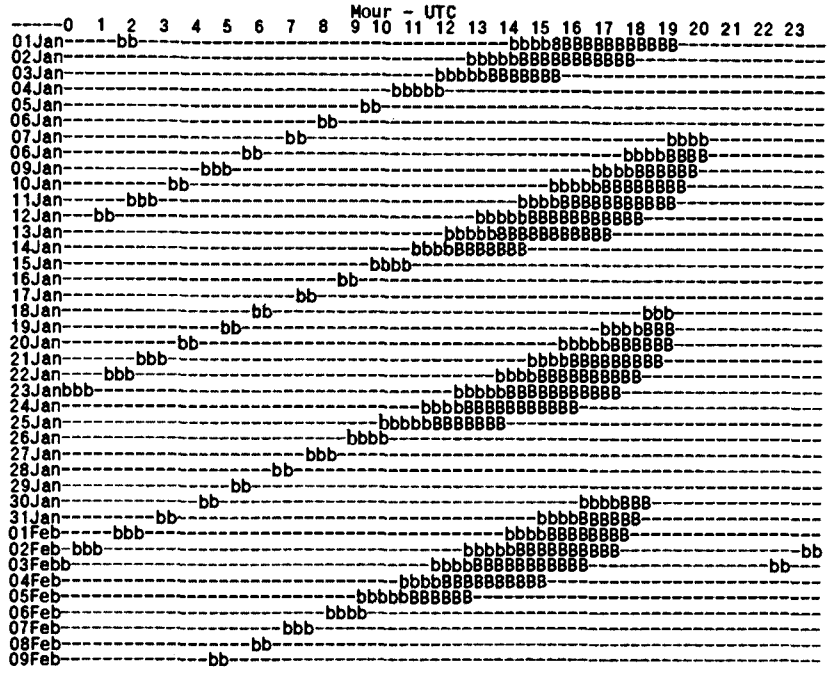
The following launching announcements have been received:

Int'l No 1990-	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
076A	COSMOS 2097	Aug 28	USSR	706.9	38881	619	62.8
077A	BS-3A	Aug 28	Japan	672.0	37905	177	28.8
078A	COSMOS 2098	Aug 28	USSR	109.2	2001	407	82.9
079A	SKYNET 4C	Aug 30	ESA	1411.0	35869	34719	4.4
079B	EUTELSAT-II F1	Aug 30	ESA	758.5	35866	6509	3.4
080A	COSMOS 2099	Aug 31	USSR	88.7	258	191	82.3
081A	FENGYUN	Sep 03	China	102.7	894	879	98.9
081B	PRC-31	Sep 03	China	102.8	896	882	98.9
081C	PRC-32	Sep 03	China	102.7	894	875	98.9
082A	RESURS-F9	Sep 07	USSR	88.8	267	193	82.6
083A	COSMOS 2100	Sep 14	USSR	104.9	1026	978	82.9
084A	MOLNIYA 3-39	Sep 20	USSR	735.0	40782	454	62.7

Bob Arnold VK3ZBB ar

AO-13 Schedule 01Jan91 to 09Fab91

Station: Adelaide



AO-13 Transponder Schedule 01Jan91 to 25Mar91

```
Mode-B :  MA 000 to MA 165
Mode-JL:  MA 165 to MA 190
Mode-LS:  MA 190 to MA 195
Mode-S :  MA 195 to MA 200
Mode-BS:  MA 200 to MA 205
Mode-B :  MA 205 to MA 256
Omnis  :  MA 240 to MA 030
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Efforts to Understand WO018 Attitude Continue; New Picture Software Uploaded

Ground controllers at Weber State University (WSU) are continuing their efforts to analyze the attitude behaviour of WEBERSAT-OSCAR-18 (WO-18). They have observed over the past several months that WO-18's Z-axis spin rate has been slowly decreasing. In an effort to understand this phenomenon, the students in the Computer Science Department are building a database to store the past ten months of real-time telemetry and Whole Orbit Data (WOD) collection. This will allow engineers to retrieve data and plot telemetry parameters quickly for analysis. Storing this much data immediately present a significant challenge in view of the enormous volumes of data involved, however, ground controllers will have valuable tool in order to characterize spacecraft motion and health.

To cope with the slowing of the spin rate of

WO-18 and to enhance picture taking, new on-board software has been uploaded to WO-18. This imaging software has the added "smarts" to look at the solar array (S/.A) currents, wait for a specified S/A current, and then snap a picture. By using solar array currents, WSU engineers will use this information to predict when the CCD camera is earth pointing and thus produce better pictures.

In the upcoming weeks, new software will also be loaded to include the CCD Light Spectrometer data in the telemetry. The spectrometer is designed to measure the spectrum of sunlight reflected from the earth's atmosphere. This will provide scientists with the composition of the atmosphere at specific places and times.

Radio amateurs who wish to process WO-18 images can obtain more information about WEBERWARE 1.0 from the AMSAT Software Exchange at AMSAT-NA HQs or from AMSAT-Australia GPO Box 2141 Adelaide SA 5001

HR AMSAT NEW SERVICE BULLETIN
321.5 FROM AMSAT HQ
SILVER SPRING, MD NOVEMBER 17, 1990

Engineering Team reports on current status of Microsats

Beta testing of the new PACSAT BBS software uncovered a minor bug which could only be discovered while the bird was being used by multiple stations. After analysis of a memory dump from AO-16, the failure mode was discovered and was reproduced on a ground-based Microsat simulator. The problem was fixed and AO-16 was scheduled to be reloaded with the new code during the weekend of 17 November 90.

The AMSAT Microsat Engineering team has generated the following update on all the Microsats dated 16 November 90:

AO-16

AO-16 is currently running the basic command and telemetry system, without the Whole Orbit Data (WOD) routines. This is in preparation for a full reload this weekend with an updated operating system. Fixes include various improvements in memory utilization, making more memory available to application programs. This operating system will support the first production version of the file server software, loading will start this weekend. The new version will support the full 8 megabyte file system.

DO-17

No Changes. Uploading of new software is planned for December.

WO-18

The version 3.0 imaging software was unloaded 11/13/90. The 3.5 version was loaded 11/14/90. This version uses the arrays currents as well as the horizon sensors in the attitude determination algorithm. A variable time has been added in order to allow a longer time for constraints to be met before an image capture is triggered.

LO-19

No Changes. Uploading of the Pacsat file server is planned for late November. **ar**

WICEN

VIA TIM MILLS VK2ZTM C/O PO BOX 1066 PARRAMATTA 2124

Second Gladesville/AUSSAT Test

The major theme in the second ATV test though an AUSSAT transponder on the 30th January 1991 will be WICEN. The Federal Co-ordinator, State Co-ordinator and the various groups are invited to compile a taped segment for inclusion. It should be self contained with a head and tail to announce the particular group or Co-ordinator and contain a report about that group. Length, up to ten minutes. Tape format, use a new tape and U-matic preferred but can be Beta, VHS or Video 8. Advise the VK2 Division or direct to Gladesville ARC, PO Box 48, Gladesville 2111 or (AH) phone 02 427 0530 now if you will be taking part. Confirmation of material by January 9th and delivery by 22nd January. **ar**

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

To all Divisional members and readers, may I on behalf of the Council and office bearers wish all a Happy New Year — or as much as the circumstances permit.

The fees for the various Divisions are to be found on page 3 of this AR. The full and associate fee for VK2 is $65.00 for 1991; the student and concession grade $52 and family and non-AR fee is $38.00. If your renewal became due on the first of this month, why not take advantage of the three-year renewal period (except students). Your renewal has to reach the Federal Office by 18 January so that an address label for the February Data issue of AR is available for you. Late renewals may not have a copy available.

Divisional Office and Broadcasts

The Divisional Office re-opens on Monday 21 January at 11am. During the break, normal correspondence to the Division should go to (mail) PO Box 1066, Parramatta 2124; fax to (02) 633 1525 or to the phone-answering machine on (02) 689 2417. It will be handled over this period, as staff and councillors are available. The broadcasts for the break are pre-recorded, morning only up to 6 January. The live transmission starts again on Sunday 13 from VK2WI, for morning and evening, at 10.45am and 7.15pm. Many of the other Divisions' broadcasts take a break at this time of the year, so if you want to keep up with news, then have a look for VK2WI on 7146 and 10125kHz morning, and 3595 and 10125kHz evenings. Plus 28320kHz if the openings are right.

Gladesville/AUSSAT Test

A second test is scheduled for Wednesday evening 30 January. Listen to VK2WI (or some other Divisional broadcasts) for satellite and transponder details. It may be on a national beam this time.

QSL Bureau

Would members please note a minor change in Bureau operation. All questions, card-handling payments, callsign changes etc are to be sent in writing to PO Box 1066, Parramatta 2124. No phone enquiries can be taken at the office as the staff are not involved. Cards for OUTWARD despatch should be sent, as usual, to PO Box 73, Teralba NSW 2284, or left at the Parramatta office.

February Exam

The next Divisional exam is scheduled for Tuesday evening 19 February. The closing date is 29 January. Details and application forms from the office.

A New Year

The Divisional year begins on 1 January. It will not be long until the call for council nominations (during February), this year the council contains nine members. The AGM comes up late April. The Gosford Field Day will be on Sunday 17 February, the usual venue of the Gosford Showground. The Parramatta Trash and Treasure for January will be a week earlier — Sunday 20 at 2pm due to the normal weekend being part of the holiday weekend. The VK2RWI packet radio facility was recently upgraded. There are minor operational changes. Would clubs and groups please complete their information forms and

return same to the office if still outstanding. These allow the Division to inform callers about you. To lighten, or maybe increase, the council workload, meetings are now twice a month. If you have a WICEN enquiry, ask your club, for all were recently sent an information kit, or WICEN (NSW) Inc at PO Box 123, St Leonards NSW 2065.

New Members

Twice-monthly council meetings will enable a quicker processing of new member applications. A warm welcome is extended to the following who joined the NSW Division during November:

J Carras	Assoc	Bexley
S Churchill	Assoc	Miranda
A Ruedlinger	Assoc	Strathfield
W V Thibault	VK2FOX	Tamworth
E D Williams	VK22VEC	Springwood

VK3 NOTES

JIM LINTON VK3PC

Retrospect on Year 1990

The Inwards QSL bureau has had a successful first year under its new way of operation via participating clubs acting as QSL card distribution points.

Using a computer data base listing of all registered users it is an extremely efficient operation.

In a dramatic overhaul of this important membership service, action was taken to ensure non-WIA members did not benefit without contributing to the bureau's running costs.

Most members fully support this action against those who don't pay their way.

Since the new bureau began operation a year ago as a free membership service, a few non-members have chosen to pay a fee to get their cards. This service fee is set to rise considerably in 1991.

The Inwards QSL Bureau cost in 1990 around $4000 (estimate at time of writing these notes).

In a survey of every 10,000 cards received by the bureau it has been found 53 per cent are for non-members.

Those cards still have to be sorted even though they won't be collected.

By their actions in soliciting cards the non-members are indirectly using the funds of members to the tune of around $2000 a year.

An even more worrying aspect of this situation is the bad image they give all VK operators and the poor international goodwill caused by the unclaimed and not acknowledged cards.

WIA Victoria has received complaints from overseas about VK operators asking for a QSL via the bureau, but never sending a card in return.

No wonder — with more than half of the cards received at the Inwards Bureau being unclaimed by non-members.

Under close review is the drain on members funds being spent on repeaters.

Well in excess of 50 per cent of all repeater users are not members of WIA Victoria.

The Victorian Technical Advisory Committee, through David Tilson VK3UR, is compiling a survey and evaluation of WIA repeaters.

Part of the evaluation process we expect to result in a rationalisation of the repeater network with some repeaters being financed by non-members.

The WIA is going into bat for the Amateur Radio Service in Australia at the World Administrative Radio Conference in 1992.

Once again the non-members seem prepared to enjoy the benefits without contributing.

By the time the WIA team heads off to the WARC in Spain, members of WIA Victoria will have contributed in excess of $14,000 towards international representation.

The importance of WARC cannot be overstressed and the need for the WIA to continue playing its key role in international affairs is vital.

But one must question why the loyal WIA Victoria members must pay so dearly in supporting their hobby — while non-members just sit back and reap the benefits.

Since moving to a modern office in Ashburton two years ago staffed by a general manager we have examined a trend where radio amateurs join WIA Victoria and then drop out after 12 months of membership.

We have found a large number of these drop-outs were those who came to us for help.

They join because they want assistance with legal problems involving interference or radio masts.

The drop-outs avail themselves of a particular service — then fail to renew their membership.

They join to be part of the WIA Victoria classes, obtain discount books, or borrow the TVI filter kits and— after having used us to overcome a problem, get a bargain or qualify for an amateur licence — they don't continue to support the organisation.

The drop-outs won't pay the $42 a year it now costs to be a member of WIA Victoria.

When you speak to non-members ask them why they won't support the organisation that supports and protects their hobby.

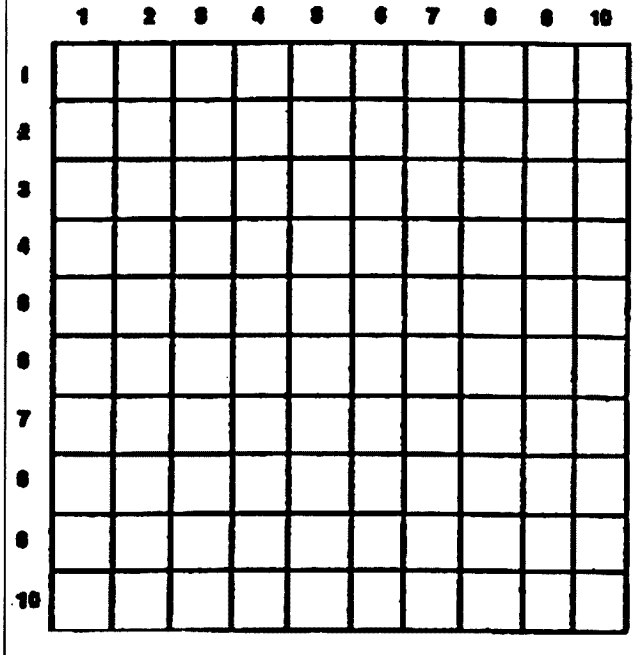
VK4 NOTES

SALLY GRATTIDGE VK4MDG

Slow Morse in VK4

At the time of writing VK4 transmits offiial WIA Slow Morse sessions on two nights of the week, but hopefully by the time you read this there will be two more stations on the air*. Considerable effort has been put into recruit-

Morseword No 46



Across
1 Expectorate
2 Section
3 Gateau
4 Soaked
5 Boast
6 Ten dollars
7 Amazon monkey
8 Grabs
9 Paper
10 Conceal

Down
1 Food
2 Beers
3 Correct
4 Secure
5 School periods
6 Be dejected
7 Hand
8 Priest's robe
9 __ and downs
10 Pass over

Audrey Ryan © 1990

Solution Page 56

ing more clubs or groups so that VK4 can present Slow Morse every night of the week, but three "silent nights" remain, so more volunteers are needed. If your club or CW net would like to make one of those nights yours, please contact the Slow Morse co-ordinator through the Townsville Amateur Radio Club, PO Box 964, Townsville 4810.

The timetable

Frequency 3535kHz
Time 0930 UTC. Note — some changes during Summer Time
Duration Approximately 30 minutes, with brief call-back following
Monday
Townsville Amateur Radio Club
VK4WIT 8.30pm local
Tuesday
Brisbane Amateur Radio ClubVK4WIL
7.30pm local
*(starting date unknown)
Wednesday
Central Highlands Amateur Radio Club
VK4WCH 7.30pm local
Sunday
Sunshine Coast Amateur Radio Club
VK4WIS 7.30pm local
*(starting date unknown)

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

Examination Dates

The following are the proposed dates for examinations this year. Some changes may be necessary as the year progresses: 2 February, 27 April, 29 June, 31 August, 26 October.

They will be held at the Burley Griffin Building, 34 West Thebarton Rd, Thebarton. Contact Don McDonald VK5ADD.

Westfield Displays

Volunteers still required; please contact John McKellar VK5BJM.

Broadcast Officer

A volunteer is still required for the above position; please let Kevin VK5IV know if you can assist.

Relay Operators

I understand that there was no relay on one frequency recently. If we don't get more volunteers, this could become a regular occurrence; it might even be on your favourite band! Please let Chris VK5PN know if you can help.

Barossa Picnic

This will be held on Sunday, 24 March at 11am, at Mt Pleasant Oval. There will be all the usual things, races, transformer tosses, fox-hunts etc. Plates of BBQ meats and salad will be available for sale. Also, if you are contemplating a shack clear out between now and then, you might like to sell some gear at one of the many tables which will be made available. Listen to the broadcast for further details.

Diary Dates

Please note: the meeting on 22 January will be a buy and sell starting at 6pm, and there will be no fifth Tuesday meeting this month.

This will mainly be a sale of disposals gear that we are lucky enough to have had donated. If, however, you would like to sell some personal gear, would you please ring Peter Maddern on 261 1433 to confirm that there will be spae available.

A Humble 'Thank You'

It came as a great surprise to learn in the latter half of last year that Bill Wardrop and I had been nominated for Honorary Life Membership of the Division. I should say that my nomination was a surprise, as I felt that the 'portrait' had been my 'thanks'. I was not at all surprised at Bill's recognition; he was co-opted on to council 12 months before me, and is still there, well into his 12th year. It is a very great honour, in my case, being the first YL in the division makes it even more so; so I would like to say, from both of us, a very humble thank you. **ar**

QSLs FROM THE WIA COLLECTION (28)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

The Boy Scouts Movement and Amateur Radio — Part 1

It is not often that a world-wide movement is the result of the foresight and determination of one man. The concept of the Modern Olympic Games and its proposer, Baron Pierre de Coubertin, is one example. (See "QSLs of the WIA Collection" in AR July and August 1990). Another is the founding of the Boy Scouts Movement by Baden Powell. "BP", as he is known by Scouts and Guides throughout the world, was born in London on 22 February 1857 as Robert Stephenson Smyth Powell. (The family's name was later changed to Baden-Powell). Son of an Oxford professor, he became a professional soldier serving in many theatres of war including India, Afghanistan and South Africa. It was his stubborn defence of Mafeking during the Boer War that made him a hero in the eyes of all Englishmen. It was his experience of scouting or reconnoitring during his war service that instilled the idea of scouting for boys. In fact, it is recorded that boys as well as the rest of the population

played an important role during the famous siege. It was scouting that led to the development of initiative and, above all, the ability to work with and help others. Baden-Powell returned to England but, before leaving South Africa, he had already written the book "Aids to Scouting" (in 1989) and found that this was being read by a considerable number of boys.

In early 1908 the famous book "Scouting for Boys" appeared. It was a book that galvanised the youth of the country into wishing to take part in activities. It was the undoubted success of the book, too, that changed BP's own life from that of a professional soldier to a leader of the Boy Scout Movement. The book emphasised "taking part" but still had a very patriotic flavour. In it we read "The history of the Empire has been made by British adventurers and explorers, the scouts of the nation ..." It is also in the book that we find reference to the Scouts' motto "be prepared", an obvious link with Baden-Powell's wartime service.

GB3BSI

Baden-Powell decided to set up an experimental camp to see if his ideas were practical. The year was 1907 and the camp was held on Brownsea Island, a small island in the entrance of Poole Harbour in Devon. There were about 20 boys in the camp and the program extended over eight days. Activities included camp duties such as cooking, knots, sanitation, together with tracking, study of animals and plants, talks on chivalry and loyalty to the King. Also in the program were life-saving, first-aid, studies in colonial geography, "deeds that won the Empire", duties as a citizen and sport. A full account of the camp can be found in the book entitled "75 Years of Scouting" published by the Scout Association.

The QSL GB3BSI is one of the "special event" QSLs characterised by the GB prefix. (See "QSLs of the WIA Collection" in AR July 1988). This QSL was sent from a special station set up at the 1967 National Patrol Leaders' Camp held on Brownsea Island itself (hence the suffix BSI in the call). It celebrated Scouting's 60 years. Needless to say, the 1907 Scout camp was a great success, so much so that BP engaged in more extensive operations that saw the Boy Scouts Movement become the great world-wide institution it now is. It is interesting to note that BP's sister, Agnes, was instrumental in establishing the Girl Guide Movement and that some years later, in 1930, his wife, Olave, became World Guide Leader.

AX2SWJ

The Scout Jamboree, an established event in the Scout calendar, is held every four years. The first one, held in August 1920 and originally planned to be held in 1918 to celebrate the 10th anniversary of the Movement, had to be postponed because of the War, but in 1920 it became a peace celebration. It was held indoors at Olympia, London, turf having to be brought to the area in order that the 8000 Scouts from 34 countries could pitch their tents. This first Jamboree was more of an exhibition and demonstration of handicrafts to visitors than the "get together" that characterised all future Jamborees.

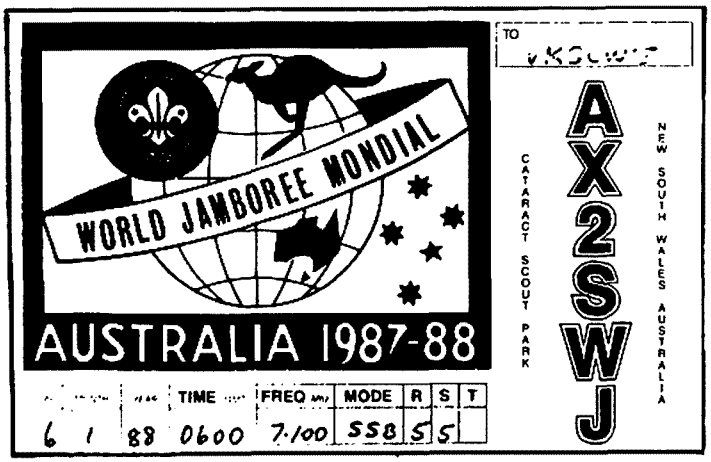
The specially assigned prefix AX was issued to the Scout Association of Australia on the occasion of the World Scout Jamboree held at Cataract Scouts Park, Wollongong NSW in December 1987/January 1988. It was the first time that a World Scout Jamboree had been held in this country. Significantly, the callsign suffix stands for Scout World Jamboree.

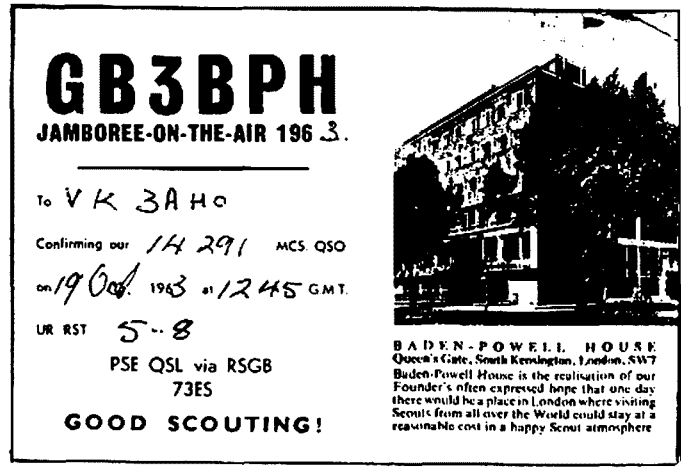
K7BS/K7WSJ

The attractive QSL of K7BS (Boy Scouts)/ K7WSJ (World Scout Jamboree) was sent from the 12th World Scout Jamboree conducted in Idaho, USA, in August 1967. This was a special event in Scouting since it marked the diamond jubilee of Scouting (1907-1967). Featured on the QSL card is the Scout emblem and Mt Borah, Idaho's highest mountain. About 13,000 Scouts from some 90 countries attended the Jamboree.

The formation of the Scouting Movement in USA has an interesting story. Mr William Boyce, an American businessman, was assisted (so the story goes) by a Boy Scout when, in 1909, he lost his way in a London fog. So impressed was Boyce with the courtesy of the boy and his principle of "doing a good turn for someone every day" that he determined to get Scouting started in his own country. Only a year later the BSA (Boy Scouts of America) became incorporated to grow into an organisation which today has by far the greatest number of members (about five million) of any other country.

One result of the first Scout Jamboree of 1920 was the formation of an International Bureau. The "World Organisation of the Scout Movement" was established to assist national Scout organisations, and today consists of three bodies — a general assembly (a policy-making body), an executive body called the "World Scout Committee" and a secretariat, the "World Scout Bureau". The Bureau's head office is in Geneva, from which the amateur station HB9S operates. The WIA Collection has one of its QSLs sent during the 32nd JOTA (Jamboree on the Air) in 1989. Amongst its many functions, the Bureau helps in the organisation of the quadrennial World Jamborees.





HL0BEJ

The HL0 prefix of Korea is assigned to universities, colleges and schools, in addition to a few institutions such as the Red Cross and the Boy Scouts. The attractive QSL HL0BEJ, showing a group of scouts on the march, comes from the Boy Scouts of Korea amateur radio station. On the reverse side of the card the operator points out that the World Scout Jamboree will be held in his country (at Seoul) in 1991. Scouting in Korea (and Japan) started as early as 1922.

GB3BPH

The specially assigned callsign GB3BPH on this QSL is dated October 1963 and stands for Baden-Powell House. It was sent to Bill VK3AHO (now VK4LC) from South Kensington, London. On the front of the QSL we read "Baden-Powell House is the realisation of our founder's often expressed hope that one day there would be a place in London where visiting Scouts from all over the world could stay at a reasonable cost in a happy Scout atmosphere." Baden-Powell House was opened by Her Majesty the Queen in July 1961, the QSL resulting from a QSO during the 1963 JOTA.

Next Month: The Boy Scouts Movement in Amateur Radio — Part 2.

Will You Play a Part?

If you would like to play a part in building up the WIA QSL collection and to save some thing for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated, but we especially need commemorative QSLs, special-event-station QSLs, especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139 or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards.

Thanks

The Wireless Institute of Australia would like to express its thanks to the following for their contribution of QSL cards towards the collection:

Brian	VK2MQ
George	VK3GI
Stan	VK3TE
Mavis	VK3KS
Ivor	VK3XB
Frank	VK2QL
Bill	VK6SW/VK9YV
Lindsay	VK3XI (ex VK3YN)
Bruce	VK3BM

Also the friends and families of the following "silent keys" (supplementary list).

Jim Ballinger	VK3NK
Frank Sullivan	VK3ZJ
Owen Rogers	G2HX (courtesy of Tom G3XMM)
George Shelley	VK2QS (courtesy of Nev VK2QF)
Jack Davis	A2DS (courtesy of Alex VK3BMS)

QSL Contributors' Ladder

Frank	VK2QL	177 points
Jim	VK9NS	172 points
Ivor	VK3XB	51 points
Ray	VK3RF	37 points
Austin	VK5WO	30 points
Bruce	VK3BM	13 points
Barry	VK5BS	12 points

Congratulations to that old timer, Frank VK2QL, and special thanks for his many generous contributions of valuable QSL cards to the WIA Collection. Frank does not enjoy the best of health and we wish him and his wife all the best in the future. Thanks to all those other contributors, especially to well-known DXer Jim, on Norfolk Island, for helping to build up the WIA QSL collection into one of the largest in the world and a most valuable source of material for amateur radio historians. **ar**

CLUB CORNER

Gosford Field Day — 17 February 1991

The Gosford Field Day is a long-running annual event in the amateur radio calendar. The next field day will be held on Sunday, 17 February 1991 and this will be the 34th year of the event.

As usual the well-known suppliers of electronic equipment, components and books will be attending the next field day. These companies will have their latest products on display and for sale, and many will have items at special field-day prices.

The organiser, the Central Coast Amateur Radio Club, has kept the format of the day in line with the changing face of amateur radio. In recent years, seminars on a wide range of topical subjects have been a popular attraction. This year, an even bigger program of topical and interesting lectures and equipment displays has been arranged. Some attractions, however, have remained unchanged and ever popular, among these the sale of many thousands of new and used surplus equipment items known as "disposals", with many bargains going up for grabs.

Last year, for the first time, a popular "flea market" was arranged for those who want to sell their surplus equipment from trestles, their trailer or from the boot of their car. The organisers expect the flea market to catch on, with even more vendors than last year.

For the past few years, more than 1000 people have attended the Gosford Field Day. The next one will be bigger than ever, so mark 17 February 1991 down in your plans to go to the Gosford Field Day.

Amateur radio operators, their families, friends and those interested in amateur radio are invited to attend the 1991 Gosford Field Day at the Gosford Showground. Gates open at 8.00am in wet or fine weather, with all displays under cover.

Field Day attractions include:

- Historical equipment display
- Disposals
- QSL Bureau
- Seminars
- Trade Displays
- Flea Market
- Television Equipment of Yesteryear display
- Packet Radio display
- Ladies' stall
- Complimentary tickets for Reptile Park and Bus Tour
- Video Theatre — Technical Presentation

Registration: Adults $6.00, pensioners $3.00, children (under 12) free. A special group concession is available on application.

Program:

0800 to 1300	Registration
0800 to 1700	Tea and coffee available in dining room
0930	Disposals booking-in closes (Dwyer Pavilion)
1000	Disposals open (entry southern end of Dwyer Pavilion)
1200	Bus tour departs
1200	Various seminars commence
1330	Drawing of raffle. Check at Information for winners.

A Field Day Information Service will be provided on the Gosford 2m repeater (6725) on Saturday afternoon and Sunday morning, using the callsign VK2AFY/P.

Trains: Sydney and Newcastle trains will be met by a courtesy bus, which will run between Gosford Railway Station and the showground between 8.00am and 10.30am. Return transport can be arranged at Information.

Parking: Plenty of off-street parking is available at the Showground.

Accommodation: Accommodation is usually scarce on the central coast at Field Day time, and early booking is advised.

Catering: Tea, coffee and biscuits available from 8.00am to 3.00pm at no charge in the dining room. Take-away food can also be purchased in the Showground.

Calls present: Bring your QSL cards for the "calls present" boards.

Equipment of Yesteryear Display: See equipment from a bygone era.

Exhibitors: Companies, persons, groups or clubs wishing to set up a trader's table or display at the Field Day should contact the Field Day Committee at PO Box 252, Gosford 2250, before 25 January 1991.

Disposals: Disposals forms and lot numbers can be obtained at the Showground on Saturday afternoon 16 February 1991. Items for disposals may be booked-in on Saturday 16 February between 2.00pm and 4.00pm, or on Sunday 17 February before 9.30am. Please note that 9.30am is the cut-off time for disposals booking-in, and late arrivals will be refused. Improperly tagged or catalogued items WILL be refused.

Flea Market: For those who wish to bypass disposals and sell their own equipment, trestles will be available in the flea market.

Information on group concessions, trade displays, flea market, disposals, programs or any other Field Day information can be obtained by writing to the Field Day Committee, Central Coast Amateur Radio Club Inc, PO Box 252, Gosford NSW 2250. AH phone (043) 92 2244.

BOB FITZGERALD VK2XRF PUBLICITY OFFICER

RAAF Williams Radio Club VK3APP

The RAAF radio club has been re-activated at Williams (Laverton) Air Force Base near Melbourne. There were previously two clubs, one of which was specifically for radio apprentices. Both these clubs had suffered periods of inactivity over the years as members had been posted out. The new club is expected to overcome this problem.

Recent administrative changes have enabled on-base clubs to accept members from outside the RAAF ranks.

It is now envisaged that the club will develop into a focus for amateur radio activity in the south-western suburbs of Melbourne, drawing members from the inner-western suburbs to as far afield as Melton and Lara.

Following the efforts of several working bees, we now have comfortable, well-appointed clubrooms with an operating room, a meeting room, a storeroom, supper facilities and an outdoor BBQ area. Further extensions are planned. The club meets at 7.30pm on Friday evenings and holds a VHF net on Wednesday evenings at 8.00pm Melbourne time on 147.800MHz.

Many ex-service RAAF members will remember the call VK3APP from the early 1950s. It belonged to the RAAF radio apprentices radio club. In those days the club operated from the Frognal training centre in Canterbury, Melbourne. There must be many amateurs now spread far and wide who were part of those early days of the club.

The new club at Laverton (now RAAF Williams) base is centred around the instructors and students at the radio school. The old VK3APP call has been kept current over the years, and the new club is now using that callsign.

Service postings may have taken many older members overseas. Perhaps you know of some through your DX working. Please let them know that the club is up and running again. We'd love to hear from them.

Look for VK3APP on HF/VHF on Friday evenings from 7.30pm (Melbourne time). Interested amateurs are invited to join in the club net on 147.8MHz on Wednesday evenings. Net controller is Len VK3DBO at Werribee. Len begins the call-in at 8.00pm sharp.

Give the club a call for old times sake. Maybe you were an operator from the Frognal days. Make contact and renew old acquaintances. Newer members will appreciate hearing stories relating to the early days of the club.

Visitors and intending new members are always welcome, both on the net and at the club meetings. Club meetings alternate between technical, practical and informal natter nights, with a short formal general meeting once every month.

Contact the President, Mick Lindsay VK3ZMN BH (03) 368 2396, or Secretary, Don McCann VK2XDT/port-3 (pkt VK2XDT-3 @ VK3RPA), BH (03) 368 2265.

73, BILL MAGNUSSON VK3JT @ VK3YZW VIC AUS OC PUBLICITY OFFICER

1991 Office Bearers Elected at Annual General Meeting

The Townsville Amateur Radio Club held its Annual General Meeting at the SES Green Street West End Headquarters on the evening of 13 November 1990. The following lucky people were elected as office bearers of TARC for 1991.

President	Peter Harding	VK4PVH
Vice President	Gavin Reibelt	VK4ZZ
Secretary	Wayne Amisano	VK4JCU
Treasurer	Ray Hinks	VK4LU
Editor WICEN	Iain Morrison	VK4KIG
Co-ordinator Slow Morse	Ian Sutton	VK4ZT
Co-ordinator Station	Sally Grattidge	VK4MDG
Manager Activities	Gavin Reibelt	VK4ZZ
Officer Publicity	Ian Sutton	VK4ZT
Officer QSL Officer	Gavin Reibelt Fred Raabe	VK4ZZ VK4KWO
Officer Without Portfolio	Rob Mann	VK4WJ
Officer Without Portfolio	John Grott	

North Queensland Radio Convention 1991

The biennial NQ Radio Convention will be held in Townsville at the James Cook University Campus on 20, 21 and 22 September 1991.

This event, which has been hosted the previous nine times by the Townsville Amateur Radio Club, is extremely popular with those involved in radio and communications, with the event being a mixture of lectures, practical demonstrations, tours of the local area, and fun moments such as junk auctions and junk maiming contests.

It provides a chance for all those people who talk on radio to see what the people at the other end of the tenuous radio link really look like.

Events concerned with the convention will be advised at a later date. In the meantime, make a bold note of the dates, and start planning to roll up to one of the best radio conventions held in Australia.

GAVIN REIBELT VK4ZZ SECRETARY TARC 1990 ar

VHF-UHF — an Expanding World

We apologise for the non-appearance of Eric's popular column this month. This is due to his sudden admission to hospital. We wish Eric a speedy recovery.

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
FREEPOST NO 4 AG LOVEDAY RUBYVALE 4702

Summary October 1990

Freq	UTC	Date	Logs	EMN	ID	Comments
7002.2	1231	0710	3	A1A	V	
7005.1	1147	2710	2	J3E/U		Tfc in Indo & Spanish
7020.3	1145	2710	1	A3E		Chin b/caster music
7080	1234	0810	2	A3E		Asian b/c poor modulation
14023.5	0400+	2310	78	F1B		24-hr station 250Hz shift
14048+	0800+	2810	68	J3E/both U/L		Radio telephone foreign
14051	0021	3110	2	J3E/L		Comm tfc Indo language
14055	1000+	dly	30	A1A	RQ also	PKJ @ 1030z Viet press
14058+/-	0500+	2310	22	mni		24 hrs Helscreiber China
14065	2312	0210		F1B		RTTY 30Hz shift (allsign ??)
14075	1000+	mni	44	A1A	VRQ	Viet press, text in English
VRQ also reported on 14035 and 14225 sending 5 ltr code						
14220	0850	2309	25	A1A	QMHB	Also F1B 1000Hz/75 same freq
14141	dly	dly	6	A1A	UMS	USR Naval Moscow
14217	1150	0710	4	F1B		RTTY idling 500Hz
18070	0852	1110		J3E/U		B/C Indian lang???
21065	1137	1810		J3E/U		For b/c male voice c/sif poss
21070	1347	0710	2	F1B	KNI	450Hz shift
21031.5	mni	mni	73	F1B	UUMS	24 hrs on air USR
2115/6	mni	mni	17	A1A	CQ5	Vietnam/
21124	dly	dy	10+	A1A	VVH	250Hz shift
21283	dly	dly	46	A1A	UUUMS	URS
21347	0500+	2409	45	F1B		RTTY 250Hz .. 18 hrs on air
24950	1212	1110		A3E		B/C Chinese

28201 upwards is being plagued by illegal broadcast stations, both CB and commercial, also many pulse signals, including ionospheric sweepers with no means of identification.

My thanks to VKs 4BG, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 5GS, 5TL, 6RO, 6XW, 6BWI and 7RH. I hope VK3XR Ivor and VK2PS Steve have recovered from their recent illnesses by now.

The 10m band is still producing many broadcasting stations on the following frequencies: 28515 (8) 28550, 28575 (18) 8980 (17) 29600 wideband FM b/c. I have also noticed an increase of OTHR stations since the Gulf Crisis on 24.940, 28.202, 29.204 and 29.600MHz. Much more activity is being reported from all states concerning governments which do not believe in giving callsigns of any sort; the 20m band has the most of these intrusions. Regular reported frequencies often have a different callsign each time logged, eg 14055 may be heard as "LKJ" today and "PKJ" tomorrow! It is a hard fact that nothing much can be done until the DoTC Monitoring Service can get its act together, or some long-suffering amateur operator, prepared to wait for the elusive callsign that should trigger action. For the present, these frequencies do not appear in the list of printed intruders, but are kept by the co-ordinator for future needs. Many intrusions are of nuisance value to us, but are possibly used as jammers; here again, nothing can be done at the present time. VK, ZL and JA seem to log many common frequencies, but not always the same month or time and, to make it more frustrating, only once! It seems to be an open "go" with those operators looking only for a clear space (channel) to get their traffic through; regulations don't come into it. Quite possibly their countries don't have any.

This year sees the end of the Special Survey in March. I hope it will be worth the efforts of those participating. **73, Gordon ar**

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 200 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

Need for Morse

I would like to suggest that the issue of a code exam be placed in the hands of amateur operators, with a voluntary vote on the matter.

This would save quite a lot of problems to persons concerned. You can understand why most persons seeking to gain their Certificate of Proficiency do not like taking the Morse exam, but they should understand that Morse Code is a specialist medium in communications.

That is what makes the AOCP so very important to all amateur radio operators. My opinion is that if you abolish Morse or do away with the Morse exams, you will be lowering the present high standard of communications that exists in amateur radio today.

If also the theory exams are simplified it may allow in the people who just want to use amateur radio as a form of "foolishment" (sic).

As a keen observer of good quality Morse, in my opinion our country has *some of the best* and most-talented Morse operators in the world. Quite a few have gained their talents because of the exam and also the training they have received from the Morse instructors in our own Division. So keep our high standard flag flying in amateur radio.

H C (BERT) HARMER VK5AUS
14 SCOTT STREET
SEFTON PARK 5083

Ultimate Automation?

Recently seen on "Quantum" was a program devoted to Stephen Hawking who communicated via a speech synthesiser. Hawking is the Lucasian Professor of Mathematics at Cambridge University. Also seen on a similar program was a voice-recognition computer.

Is it possible that a combination of these devices could be coupled to a transceiver, programmed to call CQ, DX or CQ contest, and another answer the call and log it?

NEIL PENFOLD VK6NE
2 MOSS CRT
KINGSLEY 6026

28MHz Pirates

Reference "Use it or lose it..." by Max Stark VK2CMS (AR November 1990, p9), I wish to state simply that the language spoken by these pirates is, in fact, Bahasa Indonesia. I speak only a few words of Bahasa Malaysia (which is very close) but I have asked my wife to listen with me to several stations, and she confirms my statement. My wife is Malaysian.

Secondly, I understand that the Indonesian authorities have been approached about the activity and have agreed that they have a problem. They say they are finding it difficult to police the bands due to the length of their archipelago, which is made up of thousands of islands. This information came to me via a council member of our WIA Division.

Finally, the comment that these pirates are using 40-channel AM CB sets seems a trifle odd, because channel 40 is 27.405MHz. But I do concede that they are using AM sets with channels spaced every 10kHz from 28.000 (probably lower, too) up to 29.000 and above.

Max, I think you did the right thing by bringing "our" problem to the printed page.

ALAN ROOCROFT VK5ZN
505A MILNE ROAD
RIDGEHAVEN 5097

Technical Cutback?

It disturbs and worries me to read in AR (November 1990) that its technical content may be scaled down. Are we to simply lie down and let this wash over us? I see no evidence that QST and Rad Comm have become any less technical in recent years. If anything, the quality and scope of their technical articles have been better than ever! Ours is primarily a technical avocation. Surely the WIA has a duty to publish material about those aspects of our hobby. Wherever possible, home construction and experimenting should be actively encouraged.

It may be argued that lots of elaborate equipment is necessary to get home-made equipment working properly — not so. The average amateur can build transmitters, reeivers and many other items with just the usual hand-tools plus a multimeter and RF probe, dip oscillator, power supply and dummy load. Total cost, say $300.

We presently have access to a signfiicant slice of a valuable natural resource: the radio spectrum. All of us have proved by examination that we can be trusted to operate there with an acceptable degree of technical and operating competence. Therefore, any downgrading of our technical prowess must eventually lower our standards. Can we afford to let that happen?

DREW DIAMOND VK3XU
"NAR MEIAN" GATTERS RD
WONGA PARK 3115

Morse Code

Despite what CW enthusiasts may claim, many amateurs find the code very difficult to master.

If proficiency in CW is important, then surely the maintenance of that proficiency is equally important, so let's have regular re-examination in CW; failure resulting in loss of AOCP privileges. (I wonder how many Full Calls would support this idea?)

Gone are the days when CW was an essential part of amateur radio; to require those with no aptitude for CW to achieve 10wpm in a one-off exam is ridiculous — to deny them access to the HF bands is selfish and discriminatory.

My advice to the CW enthusiasts is to lobby for CW to be made one of several *optional* topics for AOCP — that would have the support of *all* amateurs. (Other topics could be packet, satellites, WICEN etc).

Re "What Price a Life?" in December OTY — what a great argument for compulsory re-examination in CW, and Japanese and Esquimaux and any other language one might receive a distress signal in.

Re "Pounding Brass" in December AR — VK3CQ has put up a full-page proposal in support of CW when those in opposition are restricted to 200 words in OTY. Incidentally, VK3CQ's survey does not allow for dissent so the results must be considered biased, and thus valueless.

GRAHAM B JACKSON VK3TFN
PO BOX 39
UPPER BEACONSFIELD 3808

Fighting the Pirates

Peter McAdam should be commended for trying to rescue 10m from intruders (June AR, p20). It's also my favourite band. But I've been through the band-saving campaigns of the '70s and wondered why I bothered.

Remember 11m? The on and off-air abuse, car chases, representations to politicians . . . and the result? Those of us legitimately working 11m moved unceremoniously to 10, and who wants the same old arguments and time-wasting experiences again.

Like 11m, big business will win the battle for 10. One dealer's August flier has ads for a portable scanner, CB SWR meter *and* 10m amateur transceiver on adjacent pages — it doesn't even say you need a licence. History repeats.

What can WE do? We hear the WIA is being run now as a business. So let's fight big business with our business. That means we look at our resources (you and me), identify our strongest markets (band utilisation), and concentrate on maximising our profits (long-term survivability) for the Amateur Radio Corporation of Australia (our hobby).

As far as amateur bands are concerned, maintaining the status quo may no longer be our best option.

GARETH DAVEY VK2ANF
PO BOX 1367
DEE WHY 2099
ar

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr L B (Jock) Fisher	VK1LF
Mr J S MacNamara	VK2EQ
Mr J H Hill	VK2ADT
Mr Harry Jupp	VK2AJU
Mr Keith Trevenar	VK2AMG
Mr John C Bunn	VK2NDJ
Mr Max Muller	VK3LU
Mr Ron Schmidt	VK3LY
Mr Robert Anderson	VK3WY
Mr Bruce Fisher	VK3YRF
Mr I R Brown	VK4IB
Mr Lloyd Davies	VK5QI
Mr R N Wreford	VK5RW
Mr FW Clarke	VK6IO
Mr E J Stevens	VK6KXL

Roger Norman Wreford VK5 RW

On 23 September, Roger died from lymphoma, at the Hahndorf Nursing Home, in his 81st year.

Educated at The Leys School, Cambridge, England and at the Prince Alfred College, Adelaide, he was employed at the Bank of New South Wales until his retirement. From February 1942 until April 1946 Roger served as a signalman in the 13th Infantry Brigade, Signals Section (AIF) and was stationed for some time in New Britain.

He was first licensed as VK2ADC in September 1936, and was issued with his VK5 call a year later. Apart from amateur radio, he was interested in flying, and held an unrestricted private pilot licence from July 1965 until May 1976. Other hobbies included SCUBA diving, sailing, navigation, surveying and camping, and he constructed his first home in Brighton, SA.

By some mysterious (to me) means he was able to tell me that the base of my radio mast was 1853 feet above sea level, and I got the impression that, given a razor blade, a safety pin, a box of matches and a ball of string, Roger could fix aything.

Roger leaves a wife (Audrey), a son (John) and daughter (Roslind).

JOHN SCOUGALL VK5YY

Jack Hunter Hill VK2ADT

Jack was born near Muswellbrook on 31 July 1910 and was dux each year at Maitland High School, which won him a scholarship at Teachers' College and eventually Sydney University.

He married in 1933 and taught at Parramatta, Lismore, Canterbury and Homebush High Schools. Jack was also a navigator instructor at nights at the Catalina Rose Bay air base during the war. He later, as Maths Master, taught at Cessnock, Inverell and, finally, Port Macquarie High Schools, retiring there in 1971.

Jack became interested in radio at 13 years of age, and later held an amateur licence VK2ADT from 1936 until the present. He also won many DX awards around 1950, and acted as a link during the Maitland floods in 1949 and 1952. He also was a member of a net on 7124kHz for many years, until his health failed.

Lawn bowls was another of Jack's interests, being inaugural secretary of Inverell East BC, and he became that club's first Life Member, and later became President of Port Macquarie BC.

Jack passed away at Port Macquarie on 28 September 1990, and the amateur fraternity passes on condolences to his wife Rita and family.

ERN MARSTELLA VK2AEZ

Max Muller VK3LU

Max died on 6 October 1990 at the age of 86 years, eight months. He was my father and had held the callsign from 21 June 1947 under licence number 7397.

He had an abiding passion for wireless from an early age, and became involved with amateur radio in 1934 in his home state of South Australia.

Moving to Victoria in 1940, he continued with his hobby after the war years, and obtained his licence to operate an amateur station in 1947.

His later years were spent in ill health, and he spent more time turning the dial, rather than operating.

Another old-timer has passed on; however, I have assumed the callsign VK3LU to continue in the name, and have relinquished my callsign VK3BPP in so doing.

Although most of his mates have also passed on, there may be some who will be interested to learn of his passing. He is survived by a brother VK5VN, and a brother-in-law VK6VM.

JG MULLER VK3LU

J S (Jack) MacNamara VK2EQ

Jack passed away on Wednesday 14 November and his funeral was held at the Woronora Crematorium the following Friday.

Licensed in 1935, Jack was a very active amateur, and was frequently heard on the bands until a few days before his passing. One of his interests was building electronic equipment, for both himself and others. Those who saw examples of his work will attest to its high quality.

By profession Jack was a musician and, for about 10 years, was a trombone player in the ABC Dance Band, frequently heard over 2BL and network stations.

In later years, and until his retirement, he was on the technical staff of the Chemical Engineering Department at Sydney University.

Jack, always a friendly and outgoing person, was ever willing to help any of his fellow amateurs.

He will be sadly missed by all who were privileged to know him.

BILL DUKES VK2WD

Harry Jupp VK2AJU

VK2AJU Harry Jupp was born in Newcastle (England) in 1902. His family migrated to Australia in 1912. The ship they travelled on was "lost at sea" for a time and delayed their arrival by a couple of months. The family settled in Victoria.

On leaving school, Harry was indentured into the pastrycook trade. He became an expert cook. He was married in 1925 and commenced a radio-servicing business with his brother in Reservoir Victoria. Harry moved to New Zealand in 1928 and worked as an engineer in a confectionery factory. He was licensed as ZL4CJ in 1931, making all his own gear. He was active in branch meetings and contests.

Returning to VK in 1945, Harry started up a confectionery business. Licensed as VK3AJU, he was not very active until the early '60s, when he became involved with clubs in the district — FAMPARC, EMDRC & OLDTIMERS.

Harry built and equipped a 33ft cabin cruiser. This he used as a feature with a wedding reception centre at Cranbourne. He also operated a small printing works and produced many styles of QSL cards for his fellow amateurs.

Harry returned to ZL for a short period in 1974, and in 1980 retired to The Pocket (near Brunswick Heads). As VK2AJU he kept in touch with his friends for a few years. He joined the SARC and attended its meetings and functions when his health permitted. He was also a keen organist and a member of the local organ group. At the time of his death he was in the midst of converting a caravan into a mobile workshop.

Harry passed away peacefully in the Mullumbimby hospital on 9 September 1990.

GRAEME VIRTUE VK2GJ

Ron Schmidt VK3LY

My husband, Ron Schmidt, passed away on 25 October last. He was a radio ham for approximately 62 years — 1928-1990.

EILEEN SCHMIDT

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HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

January Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST. Covers the major part of NSW and Queensland.

VK SOUTH. Covers southern-NSW, VK3, VK5 and VK7.

VK WEST. Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world. To Europe, long path predictions are given in lieu of the short path, as the former is open at more reasonable hours.

The charts explained

These charts are different to those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 uV/metre (dBU). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands. The numbers in the column represent predicted field strength at each hour in decibels referred to 1 uV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 uV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvements. Where conditions warrant it, I have include predictions for the bands below 14 MHz, deleting the upper bands.

Ten Metres

The predictions look a little pessimistic for ten metres, but it only takes a slight "lift" in conditions to provide openings on this band. Keep a watch on the short-term geomagnetic and propagation forecasts.

Broadcasts

The VK2WI and VK3BWI Sunday broadcasts carry propagation predictions; for the bands 14 MHz and above listen on the last Sunday of the month for the month ahead, and for the bands 1.8 to 10 MHz, listen on the first Sunday of the month for that month. Often, special predictions covering current or upcoming DXpeditions will be included, so keep a listen out.

VK EAST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.6	-23	9.6	-18	-14	-18	-27	-40
2	10.8	-38	8.2	-20	-16	-21	-30	...
3	10.3	...	7.9	-26	-21	-25	-34	...
4	13.6	-33	10.5	-29	-17	-16	-20	-28
5	19.6	-17	15.1	...	-21	-15	-13	-15
6	26.0	-9	19.9	...	-26	-15	-10	-9
7	28.2	-6	23.0	...	-27	-15	-8	-6
8	27.5	-5	22.3	...	-25	-14	-7	-5
9	26.7	-4	21.6	...	-20	-10	-5	-3
10	25.7	-1	20.7	-32	-12	-4	-1	-2
11	24.8	2	19.9	-16	-3	2	2	0
12	24.0	6	19.2	-2	6	7	5	2
13	23.8	10	18.9	11	14	12	9	4
14	23.4	13	18.5	21	20	16	11	4
15	22.9	15	18.0	24	21	17	11	4
16	21.7	15	17.0	25	21	16	9	1
17	20.6	16	16.0	25	20	15	7	-2
18	19.4	16	14.9	25	19	12	4	-7
19	18.8	16	14.3	24	18	11	1	-9
20	19.2	12	14.4	22	15	7	-3	-15
21	17.9	9	13.3	14	9	2	-9	-22
22	16.7	4	12.3	5	2	-4	-14	-27
23	15.6	-2	11.6	-3	-4	-9	-19	-31
24	14.4	-11	10.8	-11	-9	-13	-23	-35

VK STH - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.9	-15	10.5	-14	-11	-15	-24	-37
2	11.6	-30	8.9	-19	-16	-20	-30	...
3	11.0	-40	8.5	-21	-17	-20	-29	...
4	14.6	-28	11.3	-30	-17	-16	-19	-26
5	21.2	-15	16.4	...	-22	-15	-12	-14
6	25.4	-9	20.8	...	-28	-16	-10	-8
7	25.2	-10	20.5	...	-29	-17	-10	-8
8	24.8	-10	20.2	...	-28	-16	-10	-8
9	24.5	-9	19.9	...	-25	-15	-9	-8
10	23.8	-8	19.2	...	-20	-11	-7	-7
11	22.8	-5	18.3	-31	-12	-7	-5	-7
12	21.7	-1	17.4	-16	-4	-2	-3	-7
13	20.5	4	16.3	-1	4	3	-1	-8
14	19.7	10	15.7	13	12	7	0	-9
15	18.9	12	15.0	18	14	8	-1	-12
16	18.3	13	14.4	20	14	7	-3	-14
17	17.6	14	13.7	20	13	6	-5	-18
18	16.8	15	13.0	20	12	3	-9	-22
19	16.2	15	12.3	19	10	1	-12	-26
20	16.2	15	12.2	19	10	1	-12	-26
21	17.0	12	12.7	16	10	3	-8	-21
22	18.9	7	14.0	10	8	3	-6	-16
23	17.6	2	13.1	2	1	-3	-12	-23
24	16.0	-5	12.0	-7	-5	-9	-18	-29

VK WEST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.4	-5	10.9	-5	-8	-15	-27	...
2	12.0	-19	9.2	-14	-16	-24	-37	...
3	11.3	-30	8.7	-19	-18	-24	-36	...
4	15.0	-21	11.7	-25	-16	-16	-21	-30
5	21.9	-11	16.9	-36	-17	-11	-10	-13
6	28.9	-5	22.2	...	-21	-12	-6	-5
7	28.4	-4	23.1	...	-24	-13	-6	-4
8	28.1	-5	22.7	...	-24	-13	-7	-5
9	27.5	-5	22.5	...	-22	-12	-6	-5
10	26.9	-4	21.9	...	-19	-10	-5	-4
11	26.1	-3	21.7	-34	-14	-6	-3	-3
12	25.1	1	20.2	-19	-4	0	1	-1
13	24.2	5	19.4	-1	6	7	5	0
14	23.3	10	18.6	15	15	13	8	1
15	23.0	12	18.3	22	19	15	9	2
16	22.5	13	17.8	24	20	15	9	1
17	22.0	14	17.8	25	20	15	8	0
18	21.0	14	16.4	25	20	14	6	-3
19	20.0	15	15.5	24	18	12	3	-7
20	18.9	15	14.5	23	16	9	0	-12
21	18.5	15	14.1	23	16	8	-2	-13
22	19.1	13	14.4	22	15	8	-3	-14
23	18.3	8	13.6	15	9	1	-9	-22
24	16.5	3	12.4	5	1	-6	-17	-31

VK EAST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.5	-39	7.9	-19	-16	-19	-28	...
2	10.7	-33	8.1	-17	-16	-20	-31	...
3	10.7	-29	8.2	-16	-16	-22	-33	...
4	10.0	-28	7.8	-14	-17	-25	-40	...
5	9.1	-25	7.1	-13	-21	-33	...	...
6	9.0	-16	7.1	-12	-24	-38	...	...
7	11.0	-2	8.8	-4	-15	-28	...	...
8	14.9	8	11.9	9	1	-9	-22	-38
9	19.5	7	14.9	11	8	4	-4	-14
10	18.9	2	14.3	-3	2	1	-3	-10
11	20.0	-6	15.9	-20	-8	-5	-6	-10
12	19.2	-13	15.2	-33	-16	-11	-10	-13
13	18.5	-20	15.0	...	-21	-14	-12	-14
14	17.7	-25	13.8	...	-24	-16	-14	-15
15	16.9	-30	13.0	...	-25	-18	-15	-16
16	16.1	-34	12.3	...	-25	-18	-15	-17
17	16.1	-34	12.1	...	-25	-18	-15	-17
18	16.9	-31	12.6	...	-26	-18	-15	-16
19	18.9	-25	14.9	...	-28	-19	-14	-14
20	17.9	-25	13.9	...	-24	-17	-15	-17
21	15.1	-31	11.7	-36	-20	-16	-16	-21
22	12.9	-37	9.9	-29	-17	-16	-19	-25
23	11.5	...	8.8	-28	-19	-20	-25	-35
24	10.6	...	8.0	-23	-18	-21	-29	-40

VK STH - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.3	...	7.8	-23	-20	-25	-36	...
2	10.5	-33	8.1	-17	-16	-22	-32	...
3	10.5	-28	8.1	-15	-17	-24	-37	...
4	9.9	-26	7.7	-14	-19	-28	...	...
5	9.0	-25	7.0	-14	-24	-37	...	...
6	8.8	-18	6.9	-14	-28	...	...	...
7	10.4	-5	8.3	-8	-20	-35	...	...
8	13.6	4	10.9	3	-6	-17	-32	...
9	17.9	7	14.3	11	6	0	-11	-23
10	19.0	8	13.5	10	9	5	-2	-10
11	17.3	1	12.8	-1	1	-2	-8	-17
12	17.5	-7	12.1	-14	-6	-6	-10	-17
13	16.8	-16	11.8	-26	-14	-11	-13	-18
14	16.1	-24	11.2	-34	-18	-14	-14	-19
15	15.4	-31	10.7	-38	-21	-16	-15	-19
16	14.9	-35	10.4	-40	-21	-16	-16	-19
17	14.9	-36	10.5	...	-22	-16	-16	-19
18	15.7	-34	11.1	...	-24	-17	-15	-18
19	17.3	-29	11.9	...	-26	-18	-15	-16
20	16.8	-28	13.2	...	-23	-17	-15	-18
21	14.2	...	11.1	...	-25	-21	-22	-27
22	12.2	...	9.5	...	-31	-29	-34	...
23	11.1	...	8.5	...	-32	-33	...	...
24	10.3	...	7.9	-35	-29	-33	...	...

VK WEST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.1	...	7.8	...	-39	...	...	...
2	10.4	...	8.0	-34	-28	-31	...	...
3	10.4	...	8.1	-22	-19	-24	-33	...
4	9.8	...	7.6	-19	-19	-25	-36	...
5	8.8	...	7.0	-18	-21	-30	...	...
6	8.6	-38	6.8	-18	-24	-34	...	...
7	10.1	-23	8.0	-15	-21	-31	...	...
8	13.0	-10	10.4	-9	-13	-20	-33	...
9	17.0	-2	13.6	-1	-3	-8	-17	-28
10	21.0	2	16.3	4	5	1	-5	-13
11	17.8	2	13.7	2	2	-2	-8	-17
12	16.8	-5	12.9	-9	-5	-7	-13	-21
13	18.4	-11	14.6	-22	-11	-9	-11	-16
14	17.5	-20	13.9	-33	-18	-14	-15	-18
15	16.8	-27	13.6	...	-23	-17	-16	-19
16	16.2	-32	12.6	...	-25	-19	-17	-20
17	15.4	-37	11.9	...	-25	-19	-18	-20
18	14.9	-39	11.3	...	-25	-19	-18	-21
19	14.9	-40	11.2	...	-26	-19	-18	-20
20	15.7	-36	11.7	...	-26	-19	-18	-20
21	13.7	...	10.8	...	-35	-30	-31	-37
22	11.9	...	9.3	...	...	...	...	...
23	10.8	...	8.4	...	...	...	...	...
24	10.2	...	7.8	...	...	...	...	...

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.6	-9	12.3	-17	-8	-8	-12	-18
2	19.7	-8	14.1	-24	-10	-7	-8	-13
3	19.8	-11	15.0	-32	-15	-9	-9	-12
4	22.1	-10	16.4	-40	-19	-11	-8	-9
5	24.0	-9	16.8	...	-21	-13	-9	-9
6	24.4	-9	17.1	...	-23	-14	-9	-9
7	24.1	-10	16.9	...	-22	-14	-9	-9
8	24.1	-9	16.8	...	-21	-13	-9	-9
9	23.8	-8	16.6	-40	-18	-11	-8	-8
10	22.8	-7	16.5	-33	-14	-8	-7	-8
11	21.7	-6	16.4	-25	-10	-6	-6	-9
12	20.5	-4	16.3	-17	-6	-4	-6	-10
13	19.8	-1	15.7	-9	-1	-1	-5	-11
14	19.0	3	15.0	0	3	1	-5	-13
15	18.3	8	14.3	10	8	4	-4	-14
16	17.6	12	13.5	16	11	5	-5	-17
17	16.8	13	12.8	18	11	3	-8	-21
18	16.1	14	12.2	18	10	1	-11	-25
19	16.1	15	11.6	19	10	2	-11	-25
20	16.4	14	11.2	18	10	2	-11	-24
21	15.6	8	10.7	9	4	-3	-15	-28
22	15.2	2	10.5	2	-1	-7	-17	-30
23	15.1	-4	10.5	-5	-4	-9	-17	-29
24	15.9	-8	11.1	-11	-6	-8	-15	-24

VK STH - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.8	-6	11.6	-11	-6	-8	-14	-23
2	19.0	-6	13.5	-16	-7	-6	-9	-16
3	19.0	-9	14.4	-24	-11	-8	-9	-14
4	21.2	-9	15.7	-31	-14	-9	-8	-11
5	21.8	-10	15.5	-36	-17	-11	-9	-11
6	21.8	-11	15.5	-38	-18	-12	-10	-12
7	21.8	-12	15.4	-39	-19	-12	-10	-12
8	21.8	-11	15.4	-38	-18	-12	-10	-12
9	21.4	-11	15.3	-36	-17	-11	-10	-12
10	20.6	-10	14.5	-30	-14	-10	-10	-13
11	19.4	-10	13.6	-24	-11	-9	-10	-15
12	18.4	-8	12.8	-17	-8	-7	-11	-17
13	17.4	-5	12.1	-10	-5	-6	-12	-21
14	16.6	-2	11.5	-4	-2	-6	-14	-25
15	15.8	4	11.2	5	1	-5	-16	-29
16	15.3	11	10.6	13	5	-5	-19	-34
17	14.6	13	10.2	14	3	-7	-23	-40
18	14.3	14	10.0	14	3	-9	-25	...
19	14.3	14	10.1	15	3	-8	-25	...
20	15.1	14	10.7	15	5	-5	-20	-36
21	14.9	9	10.4	10	2	-7	-21	-37
22	14.5	3	10.1	3	-2	-10	-23	-38
23	14.5	-1	10.2	-1	-4	-11	-22	-37
24	15.2	-5	10.8	-6	-5	-10	-19	-31

VK WEST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.2	3	13.7	2	4	0	-6	-15
2	20.0	2	15.2	-4	2	1	-3	-9
3	22.3	0	17.5	-14	-3	0	-1	-5
4	26.1	0	20.0	-23	-7	-2	0	-2
5	26.2	-2	19.4	-30	-11	-5	-2	-3
6	26.1	-3	21.4	-33	-13	-6	-3	-4
7	25.6	-4	20.9	-35	-15	-7	-4	-5
8	25.4	-5	20.7	-35	-15	-8	-5	-6
9	25.0	-5	20.3	-33	-14	-7	-5	-6
10	24.6	-4	20.0	-30	-12	-6	-4	-6
11	24.0	-3	19.7	-24	-8	-4	-3	-6
12	22.9	-1	18.4	-15	-4	-1	-2	-6
13	21.8	2	17.5	-6	2	2	-1	-7
14	20.6	5	16.5	3	6	4	-1	-9
15	19.9	9	15.8	13	11	7	0	-10
16	19.1	12	15.1	19	14	8	-1	-12
17	18.5	13	14.9	20	14	7	-3	-15
18	17.8	14	13.9	21	14	6	-5	-18
19	17.0	15	13.1	21	12	4	-8	-22
20	16.3	16	12.5	20	11	2	-11	-25
21	16.3	16	12.3	20	11	2	-11	-25
22	17.2	15	12.8	21	13	4	-7	-21
23	17.5	12	13.4	16	11	4	-6	-18
24	17.4	8	13.2	9	7	1	-7	-18

VK EAST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.2	2	21.5	-17	-3	2	2	0
2	26.9	2	20.3	-19	-4	1	3	1
3	27.3	2	22.6	-20	-4	1	3	1
4	27.0	2	22.3	-19	-3	2	3	1
5	26.6	2	21.9	-16	-2	3	3	1
6	26.0	3	21.3	-12	1	4	4	1
7	25.2	4	20.5	-5	4	6	5	1
8	24.5	7	20.4	6	10	10	7	1
9	23.7	11	19.2	18	18	14	9	1
10	23.0	12	18.5	22	19	15	8	0
11	22.5	13	18.0	24	20	15	7	-1
12	22.5	13	17.9	26	21	16	8	-1
13	22.2	14	17.6	28	22	16	8	-2
14	21.7	14	17.6	28	22	15	6	-4
15	20.4	14	16.0	26	19	12	2	-9
16	19.2	14	15.0	25	17	9	-2	-15
17	18.0	14	13.9	23	14	5	-8	-23
18	17.1	14	13.2	21	11	1	-13	-29
19	16.2	11	12.5	17	5	-7	-24	...
20	14.9	10	11.6	12	-1	-15	-34	...
21	18.3	5	13.8	10	6	-1	-13	-26
22	24.8	5	19.4	4	9	8	5	-1
23	25.5	4	20.2	-6	4	6	5	1
24	25.6	2	20.6	-13	0	3	3	0

VK STH - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.3	0	21.0	-22	-6	-1	1	-1
2	26.7	0	21.7	-25	-7	-1	0	-1
3	26.7	0	22.1	-26	-8	-2	0	-1
4	26.7	0	22.0	-25	-8	-2	0	-1
5	26.1	0	21.4	-23	-6	-1	0	-2
6	25.7	1	21.1	-18	-4	0	1	-1
7	25.2	2	20.5	-12	0	3	2	-1
8	24.6	4	20.0	-3	5	6	4	-1
9	23.8	10	19.3	16	16	13	8	1
10	22.8	11	18.4	22	19	14	7	-1
11	21.9	12	17.6	24	19	13	5	-4
12	20.9	12	16.7	24	18	12	2	-8
13	20.5	13	16.3	25	18	11	1	-10
14	19.9	13	15.8	25	17	10	-1	-13
15	19.4	13	15.3	24	16	8	-3	-16
16	18.6	13	14.5	23	14	5	-7	-21
17	17.7	13	13.7	21	12	2	-11	-26
18	16.8	13	12.9	19	9	-2	-16	-33
19	16.6	13	12.7	19	8	-3	-18	-35
20	16.1	10	12.5	15	3	-9	-26	...
21	19.4	6	14.5	12	8	2	-8	-19
22	22.4	4	17.0	2	6	5	1	-6
23	24.9	2	19.2	-10	1	3	2	-1
24	26.1	1	20.5	-17	-3	1	2	-1

VK WEST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.6	2	19.4	-12	0	2	2	-2
2	24.7	1	19.8	-16	-3	1	1	-3
3	25.1	1	20.5	-19	-4	0	1	-2
4	25.4	1	19.2	-19	-4	0	1	-2
5	25.7	1	21.2	-18	-4	1	1	-1
6	25.2	1	20.8	-16	-2	2	2	-1
7	24.9	2	20.4	-12	0	3	2	-1
8	24.4	4	19.9	-5	4	5	3	-1
9	23.7	7	19.3	6	10	9	5	-1
10	23.0	11	19.1	20	18	14	8	0
11	22.2	13	17.9	24	20	15	7	-3
12	21.5	13	17.2	25	20	14	5	-5
13	20.8	13	16.6	25	19	12	3	-8
14	20.6	14	16.4	26	19	12	2	-9
15	20.3	14	16.1	26	19	11	1	-11
16	19.8	14	16.1	26	18	10	-1	-13
17	18.8	13	14.7	24	15	7	-5	-19
18	17.8	13	13.9	22	13	3	-10	-26
19	16.8	13	13.0	20	9	-2	-17	-34
20	16.1	10	12.4	16	3	-10	-28	...
21	14.8	10	11.5	12	-3	-18	-39	...
22	18.1	7	14.1	15	7	-2	-15	-30
23	21.4	4	16.4	2	6	4	-1	-8
24	23.7	3	18.5	-6	3	4	2	-3

VK EAST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.8	-10	17.2	-36	-17	-11	-9	-12
2	20.5	-10	15.5	-27	-13	-9	-10	-15
3	18.3	-9	13.8	-18	-9	-9	-13	-21
4	16.5	-8	12.4	-11	-7	-10	-18	-28
5	15.2	-4	11.4	-5	-6	-12	-23	-36
6	14.1	0	10.6	0	-6	-15	-29	...
7	13.6	6	10.3	5	-6	-18	-35	...
8	13.2	9	9.9	7	-6	-20	-40	...
9	12.6	11	9.6	6	-9	-24	...	...
10	11.4	12	8.7	2	-16	-34	...	...
11	10.0	13	7.7	-4	-27	...	...	...
12	9.8	13	7.6	-6	-29	...	...	...
13	12.6	13	9.4	7	-8	-24	...	...
14	17.8	10	13.8	18	10	1	-11	-26
15	17.2	9	13.3	11	7	1	-8	-20
16	18.9	4	14.6	1	4	2	-4	-12
17	18.2	-4	13.9	-12	-4	-4	-8	-15
18	18.5	-10	14.0	-24	-11	-8	-10	-15
19	20.6	-11	16.2	-36	-17	-11	-9	-11
20	24.0	-9	18.3	...	-22	-13	-8	-8
21	26.7	-7	20.7	...	-25	-14	-8	-7
22	27.5	-8	21.2	...	-26	-15	-9	-8
23	26.7	-9	20.2	...	-24	-15	-9	-9
24	24.9	-9	18.9	...	-21	-12	-9	-10

VK STH - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.6	-9	17.8	-39	-18	-11	-9	-10
2	21.6	-8	16.3	-28	-13	-9	-9	-13
3	19.7	-8	14.9	-20	-9	-8	-10	-16
4	18.1	-6	13.6	-12	-6	-7	-13	-21
5	17.0	-3	12.7	-5	-4	-7	-16	-27
6	15.9	0	11.9	1	-2	-9	-20	-34
7	15.2	5	11.5	6	-1	-10	-24	...
8	14.4	9	10.8	9	-1	-13	-30	...
9	13.6	10	10.3	9	-4	-18	-37	...
10	12.1	12	9.2	5	-12	-28	...	...
11	10.4	13	8.0	-2	-24	...	...	...
12	10.1	13	7.8	-4	-27	...	...	...
13	13.0	12	9.7	9	-6	-21	...	...
14	17.9	12	13.9	19	11	3	-8	-21
15	17.0	7	13.1	8	6	0	-9	-21
16	16.3	-3	12.4	-5	-3	-6	-13	-24
17	16.2	-12	12.2	-17	-9	-10	-14	-23
18	17.0	-17	12.7	-28	-14	-12	-14	-19
19	19.0	-17	15.0	-38	-19	-13	-12	-15
20	21.9	-13	16.4	...	-23	-15	-11	-11
21	24.4	-11	18.6	...	-28	-16	-10	-9
22	25.8	-9	20.1	...	-27	-16	-10	-8
23	26.2	-9	20.5	...	-26	-15	-10	-8
24	25.5	-9	19.3	...	-22	-13	-9	-9

VK WEST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.9	-11	17.3	...	-22	-13	-10	-10
2	20.5	-12	15.5	-38	-18	-12	-10	-12
3	18.2	-14	13.7	-30	-15	-11	-12	-16
4	16.4	-15	12.3	-22	-12	-10	-14	-21
5	15.0	-14	11.2	-16	-10	-11	-18	-28
6	13.9	-11	10.4	-11	-9	-13	-22	-35
7	13.4	-6	10.1	-5	-7	-14	-27	...
8	13.0	0	9.8	0	-7	-16	-31	...
9	12.6	6	9.5	4	-7	-19	-37	...
10	11.4	11	8.7	3	-12	-28	...	...
11	10.1	12	7.7	-1	-21	...	...	...
12	9.9	14	7.6	-2	-23	...	...	...
13	12.7	15	9.4	10	-4	-19	-40	...
14	17.9	13	13.8	21	13	4	-7	-21
15	18.8	13	14.5	17	14	9	1	-8
16	17.8	6	13.7	5	6	3	-4	-13
17	17.6	-1	13.6	-7	-1	-2	-6	-14
18	16.8	-10	12.9	-18	-8	-7	-10	-16
19	16.8	-16	12.7	-27	-13	-10	-11	-16
20	17.6	-19	13.2	-36	-17	-12	-11	-14
21	19.7	-17	15.5	...	-22	-14	-10	-11
22	22.7	-13	17.2	...	-27	-16	-10	-9
23	25.2	-9	19.4	...	-29	-17	-10	-8
24	25.1	-9	19.0	...	-26	-15	-9	-8

VK EAST - USA/CARRIBBEAN

VK STH - USA/CARRIBBEAN

VK WEST - USA/CARRIBBEAN

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● WEATHER FAX programs for IBM XT/AT's 8"" "RADFAX2" is a high resolution, shortwave weather fax, morse & RTTY receiving program. Needs CGA, SSBhl radio & RADFAX decoder. Also "RF2HERC", "RF2EGA" & "RF2VGA", same as RADFAX2 but suitable for Hercules, EGA, & VGA cards respectively. $35 "" "SATFAX" is a NOAA, Meteor & GMS weather satellite picture receiving program. Uses EGA or VGA modes. Needs EGA or VGA color monitor and card. + "WEATHER FAX" PC card. $45 "" All programs are on 5.25 " OR 3.5 " disks (state which) + documentation, add $3 postage. ONLY from M. Delahunty, 42 Villiers St, New Farm 4005 QLD. Ph (07) 358 2785.

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CODAN HF Transceiver 7727C. 4 - RFDS Irequency. PC. $1500.
CODAN HF 8525 Transceiver, $2750. Remote control, 99 channels, complete with twin auto tune antennas. Used only for demo. As new.
WEATHER Fax Navimate 12V $900. Demo model. New $2000. RTTY as well.
YAESU 290R 2m all mode, $390. Complete in box.
YAESU 227RB Transceiver, $275. 2m FM 10W. GC. Manual.
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2-IC 725 HF TRANSCEIVER, brand new. $1243.
TRANSAUS Communications, 53 Broadway Slreel, Cobram, 3644 PO Box 282, Phone (058) 722 433, Fax (058) 721 104

FOR SALE - ACT

● SATELLITE station 2m & 70cm multi 750A with expander-430 USB/LSB/CW/FM, incl 2M-100W & HL-60V linears, plus 13.8 @ 20A power supply. $975 the lot. (06) 288 7953. AH QTHR VK1BX.

FOR SALE - NSW

● FT-7B transceiver in original packing complete with handbook, mic, mobile brackets etc. $450 ono. Peter VK2EVB. (066) 52 7160.

● TANDY TRS80 model 3 computer — as new Rolleflex twin lens reflex camera 3.5 Xenar lens. Will sell or trade lor 3 el triband yagi or any uselul ham gear. David VK2BZM (02) 498 2259.

● DECEASED ESTATE ol John Gordon Ewing VK2JS HF transceiver Kenwood TS430S, $1000. S No 3110291, no FM fitted. Scanner, Realistic, PR031, as new, $150. Uniden VHF marine transceiver, CM480, $240 ono. All equipment tested and working to specs. John Rea VK2XRJ (W) (02) 805 7195 (Macquarie Uni), (H) (02) 871 7631.

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● YAESU FT290R all-mode txcvr 240/12V home brew pwr-supp for same. Tokyo HL110V 120W 2M linear, KDK FM2025 Mk11-2m, txvr, all manuals, incl Rowland VK2CRP (066) 53 1027.

● BWD 539A dual trace CRO 10MHz BW C/W 2 probes TV triggering, in original carton, $400. Lloyd VK2ELB (02) 639 7007 QTHR.

● CUBICAL Quad dismantled c/w guy wires, requires some new bolts. $50 the lot. George (02) 521 1801 QTHR VK2GT.

FOR SALE - VIC

● EMOTATOR 1200FXX heavy duty rotator, $695. FB condition. Ted VK3TG (052) 593 225.

● QST Magazine 1988/89/90 $5 per issue including postage. WIA Executive Office, PO Box 300, Caulfield South, Vic, 3162.

● SHACK cleanout. FT901DM and ant tuner, ext vfo, ext speaker. CW and AM filters. VGC $1200. Large selection ol AR magazines and reference books - free with FT901DM. Old Geloso G222 160-20mx AM tx $50. Kenwood DM-81 dip meter, PC, $120. Leader LSG-16 signal generator. VGC $100. 20-Year collection of 'junk box' items — make an offer and take it all away! RingAfan VK3ADK AH (03) 337 7332.

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● LINEAR amp FL2100B $600. Pair of new 572B T160L, $250. TH6DX Yagi $300. Heathkit SB610 CRO kit, $50. Receiving tube manuals: 1945, 1954, 1961, 1970. Valves, new, $3, GC, $1. 6AU6, 6BA6, 6EA8, 6GM6, 6AH6, 6BZ6, 6AK5, 6AQ5, 6SK7GT, 5Y3GT, EL32, 1D8GT, 6SL7GT, 6J6, 6J5, 6BJ6. Pair 6146B new, $55. Mica fixed condensers 2500V wkg. Filter condensers low volts, new. Inductances, silver plated ex-disposals, also inductances and variable capacitors, ex-BC375 tuning units. Nally tower, lightweight type. reasonable offer. Buyer to remove. VK3XB QTHR (03) 808 4686.

● MOTOROLA Mocom 70 UHF high band mobile transceivers, 8 chan, 35W o/p limited number left, $60 ea plus freight if reqd. Geelong Amateur Radio Club, Box 520 Geelong. (052) 78 2374.

● SWAN 350 HF transceiver with power supply operations & maintenance manual, in good order, $250. (053) 31 7425 Charlie VK3DCS QTHR.

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● HAND TRANSCEIVER Kenwood TR2400. Digital readout, 10 programmable memories, many other features. $276. Speaker/mike and base station/Fasl-charger, $60. All GC with manuals. Original cartons, $310 complete. John VK4SZ QTHR (070) 61 3286.

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● LARGE TX output tuning capacitors - suit HB linear or ATU Yaesu FT-101 lxcvr, clean original cond. Mervyn VK4SO QTHR (07) 846 3875.

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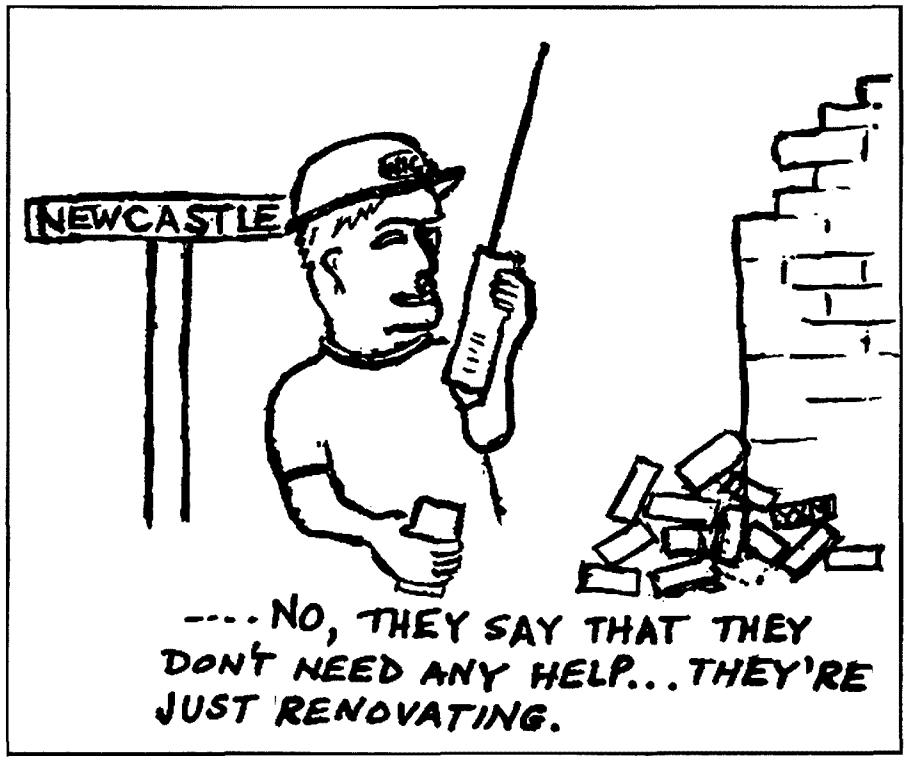

Just after the earthquake by N May VK2YXM

Drake WH7 wattmeter, $200.. VK5DX QTHR (08) 370 9196.

● ENGLISH maritime artists, large full-colour prints of liners Titanic and Mauretania. Of particular interest to ex-Radio Officers. Details Bob VK5QJ QTHR (08) 379 1845.

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● YAESU FRG-7700 receiver & antenna tuner, EC, $500. (002) 39 1210.

● DECEASED estate. Icom 735 HF txvr, ser no 15837, $1350. Kenpro 800S rotator, ser no MA0050, new, $400. Kenwood PS-30-PSU, ser no 1020449, $275. AEA PK 232, incl com fax and com pak cartridges for C64, ser no 7851, $450. Icom SM5 mic, $60. Transmitting gear sold to licensed amateurs only. Ph Peter VK7YP (002) 72 3196 QTHR.

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● TRANSWORLD T1000 solid state linear amp 2-30MHz 70WPEP drive level. 600W continuous 1kWPEP, price $3k. (09) 444 0285.

WANTED - NSW

● FT101E or similar, in good working condition. VK2BKN QTHR.

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● AIRCRAFT altimeter WWII type in working order. Ph (054) 33 2377 Mike VK3WW QTHR.

● MANUAL or circuit diag for Realistic DX302 communication receiver. A Leedham, 2/131 the Parade, Ocean Grove, 3226. (052) 55 4047.

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WANTED - Q'LAND

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● BUY or loan, QST September 1980. Gordon VK4KAL QTHR (079) 85 4168.

● KENWOOD SW-200 pwr/swr meter, couplers or compatibles. Alan VK4FVA (077) 75 2747.

● SERVICE manual and circuit or copy Sanyo VTC 5300P1IN Bealaoord VCR, all expenses covered. Tom VK4BTW QTHR (076) 38 3828.

WANTED - STH AUST

● VALVE data book, preferably with cathode ray tube data. Reference/textbook for cathode ray oscilloscope construction. VK5KI QTHR (08) 264 1902.

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144 MHz (Two metre)

Hand Held

Multi-Mode Transceiver

FM, Upper & Lower Sidebands

Serial Number – 401992

Stolen 7/11/90

Location – Elwood

Reported to St Kilda Police Station

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❑ For Sale
❑ Wanted

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Address: .....

.....

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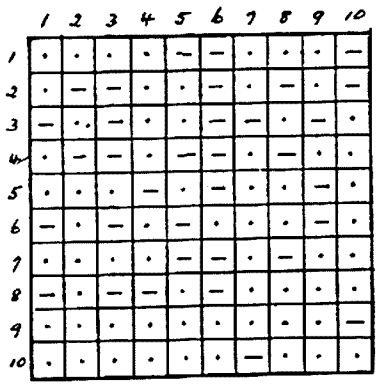
Solution to Morseword No 46



Across: 1 spit; 2 part; 3 cake; 4 wetted; 5 skite; 6 tenner; 7 saki; 8 takes; 9 sheet; 10 hide.

Down: 1 fare; 2 ales; 3 amend; 4 safe; 5 terms; 6 mope; 7 fist; 8 alb; 9 ups; 10 give

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Wireless Institute of Australia
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Caulfield South, Vic 3162

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Mr, Mrs, Miss, Ms: .....

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Call Sign (if applicable): .....

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VK2	PO Box 73 Teralba NSW 2284
VK3	Inwards – GPO Box 757G Melbourne Vic 3001 Outwards – 38 Taylor St Ashburton Vic 3147
VK4	GPO Box 638 Brisbane Old 4001
VK5	PO Box 10092 Gouger St Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart Tas 7001
VK8	C/o H G Anderson VK8HA Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6NE 2 Moss Court Kingsley WA 6026

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Sydney Newman was the first person to bridge the Tasman with radiotelephony, and supervised the installation of several MW and SW broadcasting stations. Neville Williams recounts his fascinating career.

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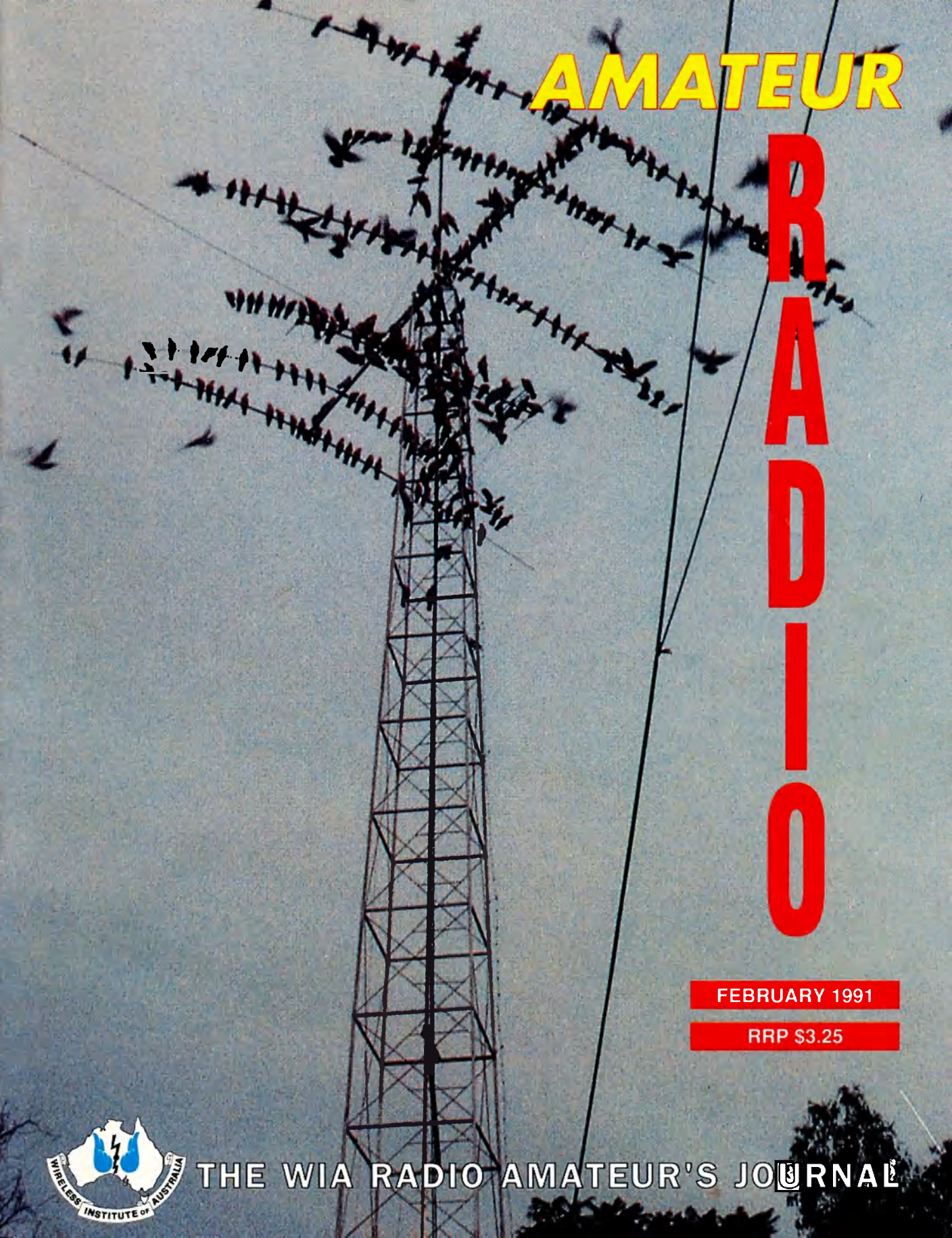

AMATEUR RADIO

FEBRUARY 1991

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THE WIA RADIO AMATEUR'S JOURNAL

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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The Editor
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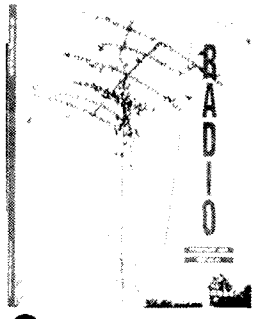
We apologise to our readers for the non-appearance of 'VHF/UHF and Expanding World'. Eric VK5LP, although recovering, is still not well enough to contribute his popular column.



Cover

The TH6 of Heather VK2HD at dusk when she suffers not so much from birdies but a strange loading effect which alters the resonant frequency of her antenna. Heather gives in to the inevitable, and waits until they leave from their daily visit to her lovely shiny tree! Contributed by John Saunders VK2DEJ.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Home-Brew Yet Again?

For a number of hours right up until now I have been involved in an interesting, if masochistic activity. I have been looking at all my past editorials, right back to the first in July 1984!

There was a reason for this strange behaviour. This month I felt impelled to write about a rather topical angle on home-brewing one's amateur equipment. I seemed to remember writing something about home-brew before and, of course, I didn't want to say the same old stuff all over again. Surprise! I had tackled the subject, not once, but twice, in November 1986 and October 1987. Both times I had emphasised the fact that the amateur service is unique in being permitted to build our own equipment. Sadly, this privilege has now been partially withdrawn in Canada, from all except those with the highest grade of licence. Do we want that to happen here too?

The more topical angle is in regard to cost of home-brew, particularly for the beginner. New or second-hand, an SSB transceiver costs plenty; if the potential buyer is a student, or unemployed, or mortgaged to the hilt, that sort of money may be impossible. But, as Drew Diamond and others have shown, it *is* possible to build fine equipment relatively cheaply. If you lean towards CW, it's even easier — the simplest modulation is on/off keying! Components need not cost much. Amateur ingenuity is all about using cheap, readily available parts in ways never intended by their designers!

Many other items need cost little or nothing, except the time to make use of them. I have just wound a transformer for a 13.5-volt power supply (20 amps peak load). The core came from a burnt-out unit acquired many years ago for future salvage. The primary wire was stripped from a refrigerator motor main winding on which the start winding was burnt-out but main okay. The secondary was four layers in parallel from the "scrag end of the junkbox". Wire from fully burnt-out motors and transformers can be twisted-up and used for aerial (antenna) construction.

Have I given you some ideas? One of my friends of long-standing calls me a cheapskate! I wonder why I never seem to have any spare time! But, moneywise, there's still a bit left over!

One other item of interest emerged from my masochistic search. This is my editorial Number 73 since taking the chair. A very significant number in amateur radio. May it mean best wishes for a long time yet. Graham and I would be happier if we had a few more technical articles coming in, and there's a letter in Over to You just crying out for a "Learn Amateur Radio Novice Course". Ron Cook's "Novice Notes" were good, some years ago, but we need someone now to do an updated series right from the basics. Perhaps someone who has just made it to novice themselves, and better understands the problems people have. One of you out there can do it! Please?

ar

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing Australian Radio Amateurs - Member of the International Amateur Radio Union

Registered Executive Office of the WIA: 3/105 Hawthorn Road, Caulfield North, Vic, 3161

All mail to: **PO Box 300, Caulfield South, Vic, 3162** Telephone: (03) 526 5962 (03) 523 8191

Fax: (03) 523 8191 (Non-dedicated line)

Business Hours: 9.30 am to 3.00 pm on Weekdays

General Manager and Secretary: Bill Roper VK3ARZ

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Vale Ann McCurdy

Ann McCurdy
Federal Office

It is with deep regret and sadness I notify members that a valued member of the WIA Executive Office staff, Ann McCurdy, passed away on December 21st 1990 after a long and courageous battle against cancer.

Ann gave ten years of efficient, dedicated and selfless work to the WIA, during which time she served in every position in the office. Ann continued working in the Executive Office, between bouts of treatment, until only a few short weeks before her untimely death.

Although not a radio amateur, Ann knew more about the administration and organisation of amateur radio and the WIA than most others. No task was too difficult for her to handle, ranging from the day to day matters like dealing with members' telephone queries and advertising for Amateur Radio magazine, to organising the Annual Federal Conventions.

Not only was Ann a competent and loyal worker for the WIA, she was also a delightful and charming person to know and work with.

Ann is greatly missed in the Executive Office and in WIA circles. The sincere sympathy of all in the WIA who knew Ann is extended to her husband Don and sons Andrew and Simon.

May Special Issue

There is still time for you to submit an article for the May issue of Amateur Radio magazine which will be another "special" issue, this time concentrating on the Advanced Modes.

Packet, satellite, ATV, slow scan TV, AMTOR - where are all those amateurs who are at the "leading edge" of these rapidly advancing fields? Your article does not have to be technical to the point of blinding the readers with complexity. Many members who have not attempted any of these modes are keen to see simple explanations and instructions.

The Editors cannot print articles they do not have. It's your magazine. Will you help?

Africa Telecom 90

A recent ITU press release describes the highly successful regional telecommunications exhibition and conference staged by the ITU and held in Zimbabwe early in December.

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts		1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun (R Denotes repeater) Times 1045 and 1915 on Sunday	(F) (G) (S) (X)	$67.50 $54.00 $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours Mon-Fri 1100 - 1400 Wed 1900 - 2100)	Roger Henley Tim Mills David Horsfall	VK2ZIG VK2ZTM VK2KFU	1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) (G) (S) (X)	$65.00 $52.00 $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) (G) (S) (X)	$69.00 $55.00 $42.00
VK4	Queensland Division GPO Box 638 Brisbane Old 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelty Eddie Fisher Eric Fittock	VK4AOK VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) (G) (S) (X)	$67.50 $54.00 $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) (G) (S) (X)	$67.50 $54.00 $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Alyn Maschette John Farnan Bruce Hedland - Thomas	VK6KWN VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) (G) (S) (X)	$59.00 $47.50 $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$65.00 $52.00 $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).						

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

The theme chosen was "Mobilising resources for development", highlighting the telecommunication needs of developing countries.

The exhibition in which 124 organisations from 22 countries participated covered a very wide range of products and services. The 550 participants at the accompanying Forum were drawn from the private sector world-wide as well as virtually all administrations of the African continent.

No-Code USA Amateur Licence

The ARRL Letter of December 14, 1990 announces that the FCC (the USA equivalent of DoTC) will shortly drop the Morse Code requirement for the Technician class licence, resulting in the first code-free class of licence in the USA. The implementation date may be as early as February 1991.

Holders of the code-free licence will pass the same theory exam as previously, but will be permitted to operate only above 30 MHz. No special call sign designator is intended. In order to gain HF privileges, a pass in Morse code at 5 wpm can be added. No changes are planned at this time to the USA Novice licence.

It only took the USA 36 years to catch up with the Australian no-code licence, the Amateur Operators Limited Certificate of Proficiency!

JOTA

The report on the 33rd Jamboree On The Air, held on 20 - 21st October 1990, was received recently from the National Coordinator, Peter Hughes, VK6HU.

Peter notes a "Total People Involvement" of 38,500, a 14 % increase from last year, with a total number of contacts of 10,000. Even so, only 34 % of Groups nationally participated in JOTA.

The 1990 JOTA saw the first satellite link via AUSSAT into all capital cities and New Zealand. Another first was the transmission of the Opening Broadcast across one Scout Hall on a light beam with a frequency of 454,545 GHz.

In his report Peter stresses the mutual benefits between Scouting/Guiding and amateur radio, and the need for the Scout populations to back the WIA in presenting its case at the forthcoming WARC 92.

Cosmonaut On Air Again

The ARRL Letter of 14th December also noted that the Soviet astronaut, Musa Manarov, U2MIR, is again on the Soviet permanent space station MIR and has resumed operations on 144.55 MHz FM. He hopes to begin packet activity sometime after January 15th 1991.

Reference Issue

In recent years, WIA editorial policy has established that each February issue of Amateur Radio magazine is a special data reference issue.

A quick look at the index of this February 1991 issue of Amateur Radio magazine will show just how much of this reference type of material has been crammed in. Most of this material has been checked and updated by volunteer labour to take account of changes that have occurred since the publication of the 1991 Call Book.

Members are invited to comment on reference material which should be included or perhaps deleted. Obviously, for this special-reference issue, much of the normal editorial content has had to be reduced to keep the magazine within the size restrictions.

JA Amateurs in Antarctic

On 14th November 1990 a Japanese Antarctic Research Expedition left for a two year tour of duty in the polar regions. The party includes 11 members who hold amateur licences and who expect to operate from 8J1RL Showa Base and 8J1RM Asuka Observation Base, probably from 09.30 to 10.30 UTC daily on 7, 14 and 21 MHz.

WIA Membership Renewals

Although the WIA has had cyclical monthly billing for membership dues for several years now, the majority of membership dues still fall due on 1st January each year. In the first week of December over 4600 membership renewal notices were prepared and sent out to members. Office staff have spent the days over Christmas and the New Year processing the 3000 plus subscriptions so far received as at the first week in January.

Those who forgot to renew their membership before 31st January will not receive the February 1991 issue of Amateur Radio magazine. Those members whose subscriptions fall due at later dates should note that only one magazine is sent after their renewal falls due, but remains unpaid. If your renewal is late back copies of Amateur Radio magazine will cost you $4.00 (including postage).

Three Year Members

Whoops!! Last month's WIA NEWS item "Membership Renewals" about reading the address label confused a few members who have paid three year subscriptions.

The first paragraph of the news item should, of course, have concluded "unless you have paid a three-year membership one or two years ago.". The 01 on the label indicates that your membership cycle begins on the first of January. Naturally, if an extended membership has been paid, the appropriate January is further off. Unfortunately, the computer print-out does not include the year of renewal (not enough space on the line to fit it in) and most members renew annually.

As membership renewal notices are sent only when the subscriptions fall due, three year members will not receive a notice until their three year renewal is due. If you are one of the steadily increasing number of three year payees, and you are uncertain from your records when your renewal is due, simply contact the Executive Office and the staff will check your records for you.

1991 Federal Convention

Planning has already begun for the 1991 WIA Annual Convention to be held on the weekend of 20th - 21st April.

After investigating the costs and benefits of a number of different possible venues, it has been decided to return to the Brighton-Savoy Motel which has been used in previous years. As much of the routine business which used to be handled at the Annual Convention is now dealt with at the quarterly meetings, the length of the annual convention has been able to be reduced to two days.

Items on the agenda will still include Annual Reports and election of office-bearers. Now is the time for members to be contacting their Divisions, and for Divisions to be discussing and submitting motions for the agenda as these need to be received in the Executive Office no later than 12th March 1991.

February Quarterly Meeting

The first full meeting of the WIA Federal Executive and Federal Council for 1991 will be held on the weekend of 9th and 10th February, at the Executive Office in Melbourne. Representatives from all seven Divisions of the WIA will travel to Melbourne for this meeting to discuss many matters of vital importance to the future of the WIA and amateur radio in Australia.

A report on the proceedings

of this meeting will be presented to WIA members at the earliest opportunity.

Federal Broadcast Tapes

In response to numerous requests the production of Federal News Tapes from the Executive office has been resumed. These tapes are recorded in the Executive office and distributed to Divisional Broadcast Officers for inclusion in the weekly Divisional broadcasts.

Under normal circumstances, two Federal News segments are recorded at a time, with a limit of four per month, so that in a month with five Divisional news broadcasts, there will be one without a Federal News Tape.

If, for whatever reason, your local Divisional broadcast does not include the complete Federal News Tape, you can always catch up on Federal WIA news by listening to the news broadcast from another Division. Full details of Divisional news broadcasts are included in the WIA Directory on page three of each issue of Amateur Radio magazine.

WARC 92

Many members have taken the opportunity, when renewing their membership, of sending "a bit extra" to go towards the costs of WIA preparation for, and representation at, WARC 92. These and other donations received for International Representation now stand at $937.50.

It is with pleasure and appreciation that we acknowledge the following donations over the last few months.

J. Baldock	VK7JF
A. Berry	VK4BDF
A. Boerkamp	VK2EQC
E. Buck	VK3ADD
S. Clamp (2)	VK5ASC
A. Condon	VK5WO
K. Dickson	VK4IW
W. Easterling	VK4BBL
East Gippsland Zone	
P. Glover	VK2YPU
Hornsby & District ARC	
R. Huey	VK2AHU

D. Johnston VK4EKA
RNARS NSW Chapter
A. Smith VK6BEB
R. Tulloch VK4BF
J. Wallace VK5BJF
R. Williams VK2AMI

So You Have a Complaint

From time to time, some members become unhappy about some aspect of the WIA or amateur radio in general. Meetings and on-air ragchews often develop into gripe sessions of "Why don't they___" or "They orta__"

Like all organisations, there is a right way to approach the WIA for you to receive the maximum attention to your concern. In many ways the structure of the WIA could be said to be unnecessarily cumbersome (it was originally modelled closely on the Australian system of Federation - enough said!).

For your representative body to take note of your needs, complaints or suggestions, you must, in the first instance, direct them to your local Division. If it is a local matter, your concerns will be handled by your Divisional Council.

However, if it is a matter for the Federal Body, your Divisional Council will pass the matter to the Federal Executive through the Divisional representative member of Executive and, if necessary, to the Federal Council through the Divisional Federal Councillor.

Please note that the Federal Body of the WIA must be approached through your local Division.

Also, please find out first if you really do have a complaint. Many of the whinges that reach this office are based on rumour, misheard statements, or misinterpreted data, and can often be satisfied by simple explanation or information.

Over to You Letters

Some months ago it was decided, because of space restrictions in Amateur Radio magazine, to limit the size of all "Letters to the Editor" published in the magazine to a length of 200 words.

Members will be pleased to learn that the restriction on size of "Over to You" letters has now been modified to allow up to 300 words.

This segment of your magazine is provided to enable you to express your viewpoint. Why not use it?

Amateur Radio Content

In the November 1990 issue of Amateur Radio I asked for comment about the future content of the magazine. A number of responses have been received and, as was to be expected, a wide range of views has been presented. It is probably not going to be possible to please everyone completely, but either of two main themes were present in each response. Keep the emphasis in Amateur Radio magazine on technical articles, and provide more articles for beginners.

Great! That is exactly what the Publications Committee had decided. But where are these articles going to come from?

Amateur Radio magazine is a membership journal, produced mainly by volunteers, and dependent entirely on the submission of articles for publication by WIA members. Yes, that means you!

When was the last time you submitted an article for publication in your journal?

Despite the commercialisation of our hobby, the future of amateur radio is still dependent upon experimentation. Experimentation with electronics and with methods of communication; and the sharing of that experimentation with other like-minded enthusiasts.

If the hobby of amateur radio is to survive in Australia, the radio amateurs of Australia must experiment and must publish their results. The obvious place to publish is your own journal, Amateur Radio.

Can the Editors look forward to receiving your articles soon?

Technical Extracts

Amateur Radio magazine policy has always been to not republish articles from overseas publications. And there have only been rare, if justifiable, exceptions to that rule.

Several overseas radio amateur magazines publish short extracts from interesting technical articles published elsewhere. Probably the most famous of these technical digests is "Technical Topics" by Pat Hawker G3VA which appears monthly in the RSGB publication "Radio Communications".

Incidentally, it is interesting to note the frequency with which these overseas magazine columns refer to articles published in our own Amateur Radio magazine.

Well, the time has come for Amateur Radio magazine to commence its own regular "Technical Extracts" column, bringing to WIA members brief details of interesting overseas experimentation and articles.

The only problem is, who will write the column?

Basically we need someone who is technically knowledgeable and able to competently precis articles. If you are able to assist, please contact the Executive Office as soon as practicable. Do not worry if you do not normally have access to overseas publications. We will ensure that you receive copies of all the major English language overseas amateur radio publications. ar

Callsign Suffixes

Amateur station callsigns normally commence with the letters "VK" followed by a numerical State identifier (ie: 1/2/3/4/5/6/7/8/9/ OR 0). HOWEVER, TO COMMEMORATE SPECIAL EVENTS, THE USE OF "VI" OR "AX" may be authorised on a temporary basis.

The alphanumeric series outlined is suffixed with up to three letters which indicate the class of amateur licence held and the individual identity of the station. Callsign suffixes are allocated according to the following table:

Two-Letter Suffixes:

All two-letter suffixes except "AA" and "WI" indicate a full call licensee.
AA = Official DOTC callsign
WI = Allocated to the Wireless Institute of Australia.

Three-Letter Suffixes:

AAA-AZZ = Full call licensees
BAA-BZZ = Full call licensees
CAA-CZZ = Full call licensees
DAA-DZZ = Full call licensees
EAA-EZZ = Full call licensees
FAA-FZZ = Full call licensees
GAA-GZZ = Full call licensees
(Note: GGA-GGZ — allocated to the Girl Guides Association)
AA-HZZ = Not allocated
IAA-IZZ = Not allocated
JAA-JZZ = Combined licensees
KAA-KZZ = Combined licensees
LAA-LZZ = Novice licensees
MAA-MZZ = Novice licensees
NAA-NZZ = Novice licensees
OAA-OZZ = Not allocated
PAA-PZZ = Novice licensees
QAA-QZZ = Not allocated; can be confused with Q codes
RAA-RZZ = Beacons and repeaters
SAA-SZZ = Full call licensees
(Note: SAA-SDZ — allocated to the Scout Association)
TAA-TZZ = Limited licensees
UAA-UZZ = Limited licensees
VAA-VZZ = Novice licensees
WAA-WZZ = Full call licensees
(Note: WIA-WIZ allocated to the WIA)
XAA-XZZ = Limited licensees
YAA-YZZ = Limited licensees
ZAA-ZZZ = Limited licensees
Note: Certain "non-standard" suffixes are allocated, including: RAN, GGx, TTx, ITU, BSx, SJx, etc.

Stolen Equipment Register

The Stolen Equipment Register is one of many services offered to members by the Wireless Institute of Australia. It has now been in operation since 1980, and is maintained on a computer database in the Executive Office. At regular intervals, updates of the complete list, sorted into categories of : Equipment Manufacturer/Model, Owner, Date Stolen are distributed to each Division. Members wanting to take advantage of their register, either to publicise the theft of their equipment, or to check equipment they are about to purchase, may contact their Division , or write or telephone the Executive Office.

Any telephone reports of stolen equipment must be followed immediately with written confirmation of the details. For maximum efficiency, these details should include: Manufacturer's name, Model, Type of equipment, Serial number, Date stolen, Owner's name, address and call sign, any distinguishing features or modifications, Police contact (if any). When equipment is recovered, it is important that you advise the Executive Office as soon as practicable. This list is the most up-to-date information we have at the time of going to press, but is based entirely on information received from you, the member. Would all readers please check this list and immediately advise if there are any amendments.

WIA Database List of Unrecovered Stolen Equipment as at 8 January 1991

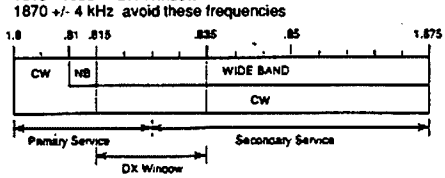
MANUFACTURER	MODEL	DESCRIPTION	SERIAL NUMBER	OWNER	DATE STOLEN	COMMENT
AZDEN	PCS-3000	2M FM MOBILE	36738	VK2KCV	01/06/87	NO MICROPHONE - NO BRACKET
BELCON	LS-202E	2M M/MODE H/HELD	401992	VK3YYD	07/11/90	
BWD	804	DC-10MHZ SCOPE	51767	VK2ZQW	11/01/90	-
DICK SMITH		AUDIO GENERATOR		VK2XJC	15/05/85	-
	EXPLORER	70CM FM TRANSCEIVER		VK2KUR	24/09/84	EXTENSIVE MODIFICATIONS
DRAKE	TR-7	HF TRANSCEIVER	2333	VK2AML	16/05/90	OWNERS NAMES ENGRAVED
DRESSLER	EVV2000	2M PRE-AMP	1027	VK2XJC	15/05/85	-
ELECTROPHONE	TX470T	UHF TRANSCEIVER	50600672	VK6ZPL	11/04/87	-
EMTRONICS	NOISE BRIDGE	EM342		VK4AAE	27/10/89	-
GALAXY	5	HF TRANSCEIVER	5672V2118	VK3UB	06/06/87	REMOTE VFO
	5	HF TRANSCEIVER	5503V1309	VK3UB	06/06/87	REMOTE VFO
GCOL	GV-16	2 M FM HANDHELD		VK3JDO	17/11/89	WITH ANTENNA
GME	TX472S	40 CH UHF T/CEIVER	912 48058	VK3KLF	14/06/90	-
	TX830	40 CH AM CB	8770556	VK4IS	15/08/90	-
ICOM	HM4G	SPEAKER MIC	-	VK5ZGB	16/12/89	-
	IC02A	2M FM HANDHELD	23186	VK2FZH	09/06/89	WITH BP3 AND BC25E
	IC02A	2 M FM HANDHELD	29906249	VK5ZGB	16/12/89	-
	IC044	70 CM FM HANDHELD	-	VK5ZGB	16/12/89	-
	IC202	2M SSB TRANSCEIVER	5144	VK4ZSH	03/09/85	-
	IC202	2M SSB TRANSCEIVER	03482	VK3ZJY	11/08/87	-
	IC202	2M SSB TRANSCEIVER	41013616	VK3ZBI	01/10/85	-
	IC211	2M M/MODE T/CEIVER	6804309	VK3BRV	17/10/84	-
	IC215	2M FM PORT T/CEIVER	05156	VK2AMX	20/11/84	-
	IC22	2M FM TRANSCEIVER	12266	VK3BLC	29/04/85	-
	IC22	2M FM TRANSCEIVER	12467	VK1TR	06/02/90	NO POWER PLUG/DIAL LAMP UNUSUAL
	IC22	2M FM TRANSCEIVER	10918	VK3XD	08/02/90	-

MANUFACTURER	MODEL	DESCRIPTION	SERIAL NUMBER	OWNER	DATE STOLEN	COMMENT
	IC22A	2M FM TRANSCEIVER	FALLEN OFF	VK3YV	21/08/87	EARLY MODEL - 22 CHANNELS
	IC22A	2M FM TRANSCEIVER	8853	VK3ZU	03/05/84	-
	IC22A	2M FM TRANSCEIVER	3402112	VK2ZIG	01/07/87	-
	IC22A	2M FM TRANSCEIVER	1914	VK4ZSH	03/09/85	-
	IC22S	2M FM TRANSCEIVER	11912	VK2ETJ	06/03/88	PRE-AMP, SOCKET
	IC22S	2M FM TRANSCEIVER	14957	VK3DYZ	11/09/84	-
	IC22S	2M FM TRANSCEIVER	62014533	VK3KAW	23/12/85	-
	IC22S	2M FM TRANSCEIVER	07570	VK3KJA	14/12/87	DIGITAL READOUT
	IC22S	2M FM TRANSCEIVER	15674	VK2CIB	11/02/89	-
	IC22S	2M FM TRANSCEIVER	14727	VK3ME	14/08/85	-
	IC255A	VHF TRANSCEIVER	10308425	VK3KLF	14/06/90	-
	IC25A	2M FM TRANSCEIVER	03831	VK2DPM	04/11/84	VFO MODIFIED
	IC280	TRANSCEIVER	02592	VK2BVW	30/03/88	-
	IC290A	ALL MODE TRANSCEIVER	001532	VK3YFA	01/11/90	-
	IC290H	ALL MODE TRANSCEIVER	17701965	VK3ZBI	01/10/85	-
	IC290H	ALL MODE TRANSCEIVER	17703342	EMTRONICS	17/02/86	-
	IC2A	2M FM HANDHELD	04484	VK1MX	21/01/85	VINYL CASE
	IC2A	2M FM HANDHELD	12213837	VK5ABY	22/12/88	-
	IC2A	2M FM HANDHELD	12209700	VK2AHF	08/09/87	-
	IC2A	2M FM HANDHELD	12213830	VK3YOO	02/12/83	SPARE BATTERY PACK
	IC2A	2M FM HANDHELD	29901052	VK2CKD	05/02/86	-
	IC2GAT	2M FM HANDHELD	08616	VK3JDO	17/11/89	WITH BP70, BC36, BPSA X 2
	IC3200	2M/70CM TRANSCEIVER	01046	VK2CIM	02/08/87	-
	IC45A	70CM FM TRANSCEIVER	18351005	VK3KJC	22/02/84	MEMORY BACKUP UNIT
	IC45A	70CM FM TRANSCEIVER	01876	VK2DPM	04/11/84	-
	IC490A	70CM TRANSCEIVER	16101192	VK3BVO	01/03/83	-
	IC4E	70CM H/H TRANSCEIVER	18103021	VK3YOO	02/12/83	SPARE BATTERY PACK
	IC4E	70CM H/H TRANSCEIVER		VK2KZZ	16/08/87	CALLSIGN ENGRAVED
	IC502	6M SSB TRANSCEIVER	00618	VK3ZJY	11/08/87	-
	IC551	6M ALL MODE T/CEIVER	01273	VK4ZSH	03/09/85	INCLUDING FM, VOX
	IC551	6M ALL MODE T/CEIVER	9401253	VK3ZBI	01/10/85	-
	IC551D	6M TRANSCEIVER	99003878	VK3YSG	01/01/84	-
	IC560	6M TRANSCEIVER	01153	VK3MT	01/02/90	ENGRAVED SECURITY NO. T-00510
	IC701	HF TRANSCEIVER	8001039	VK2???	15/02/88	-
	IC701PS	POWER SUPPLY	7800978	VK2???	15/02/88	-
	IC720A	HF TRANSCEIVER	06242	VK4ZSH	03/09/85	-
	IC721	HF TRANSCEIVER	003863	A. WOJNAR	02/07/90	TRANSCEIVES ALL RFDS FREQUENCIES
	IC730	HF TRANSCEIVER	13806796	MELB UNIV	18/09/85	HOME BREW POWER SUPPLY
	IC735	HF TRANSCEIVER	36304455	EMTRONICS	17/02/86	-
	ICPS20	POWER SUPPLY	10101966	VK3YSG	01/01/84	-
KDK	2025 MK II	2M TRANSCEIVER		VK2ETJ	06/03/88	DEFUNCT FINAL
	FM2025 MK 2	2M FM TRANSCEIVER	A5020	VK2AML	03/07/88	SHARPE MICROPHONE
	MULTI 7	2M HANDHELD		VK2TJB	09/02/88	DRIVERS LICENCE NO. ENGRAVED
KENWOOD	AT180	ANTENNA TUNER	0020450	VK2???	11/11/87	-
	AT200	ANTENNA TUNER	820049	VK2DCB	16/08/84	-
	DG5	DIGITAL DISPLAY	730475	VK2DCB	16/08/84	-
	DM81	GRID DIP OSCILLATOR	4020163	VK2KLF	10/08/89	STENCILLED IN 20MM BRIGHT YELLOW
	MC-50	DESK MICROPHONE	N/A	VK5ABY	22/12/88	-
	MSI	MOBILE MOUNT	-	VK5BJA	30/05/89	-
	SP520	SPEAKER		VK2DCB	16/08/84	-
	TM221A	2M FM TRANSCEIVER	8110722	VK2CCD	09/04/88	-
	TM221A	2M FM TRANSCEIVER	8022541	VK3ZJY	11/08/87	-
	TM231A	2M FM TRANSCEIVER	0051016	VK4IS	27/07/90	-
	TM441A	432 MHZ FM TRANSC	6010370	VK4IS	27/07/90	-
	TR2400	2M FM HANDHELD	0061950	VK2DPM	28/08/84	-
	TR2400	2M FM HANDHELD	0061926	VK2PJ	20/04/85	CALLSIGN ENGRAVED
	TR2500	2M FM HANDHELD	3040009	VK2ZQC	29/05/85	MICROPHONE AND CHARGER
	TR2500	2M FM HANDHELD	3033045	VK2DYW	18/02/87	-
	TR2600A	2M HANDHELD	7030631	VK5AAR	03/10/86	-
	TR2600A	2M HANDHELD TCVER	5060934	VK2KLF	10/08/89	MISSING HAND STRAP
	TR2800A	2M HANDHELD	5060695	VK5BJA	30/05/89	INCLUDING RUBBER DUCK ANTENNA
	TR751A	2M ALL MODE T/CEIVER	7050512	VK3KMJ	25/02/90	GREY MIC - DCL MODEM BOARD
	TR7850	2M FM H/HELD T/CEIVR	202080	VK2DED	06/03/84	"N" CONNECTOR
	TR7850	2M FM H/HELD T/CEIVR M	2020661	VK2ALK	22/10/88	-
	TR7850	2M FM H/HELD T/CEIVR	1111125	VK2CCK	07/02/86	-
	TR7950	2M FM TRANSCEIVER	4010747	VK2TVG	08/06/85	-
	TR9000	2M ALL MODE T/CEIVER	1020527	VK2KAH	03/01/87	ADDITIONAL MEMORY SWITCH
	TR9000	2M ALL MODE T/CEIVER	1050780	VK3YSG	01/01/84	-
	TS120S	HF TRANSCEIVER	950619	VK2???	11/11/87	-
	TS120V	HF TRANSCEIVER	0081224600	VK2VWN	03/05/85	MT35 MICROPHONE
	TS130S	HF SSB TRANSCEIVER	1090168	VK5ABY	22/12/88	-
	TS130S	HF TRANSCEIVER	40401C8	VK2BVW	30/03/88	-
	TS130SE	HF TRANSCEIVER	2060697	VK2KAH	03/01/87	-
	TS430S	HF TRANSCEIVER	4010322	VK2XJC	15/05/85	INCLUDING FM, FILTER
	TS440S	HF TRANSCEIVER	0060078	VK2FIT	01/07/90	-
	TS440S	HF TRANSCEIVER	7090271	VK2FIT	24/10/89	WITH PS50 PSU & MC85 DESK MIC
	TS440S	HF TRANSCEIVER	0101192	VK3NRG	14/10/90	STOLEN FROM VEHICLE IN PERTH
	TS520	HF TRANSCEIVER	010296	VK2ZQW	11/01/90	-
	TS520S	HF TRANSCEIVER	820972	VK2DCB	16/08/84	-
	TS520S	HF TRANSCEIVER	?	VK2FZH	09/06/89	STICKER FROM "TURKEY RADIO"
	TS670	6M & HF TRANSCEIVER	?	VK2ZXC	28/06/90	-
	TS700A	2M ALL MODE T/CEIVER 3	50409	VK3ZJY	11/08/87	-
	TS930S	HF TRANSCEIVER	3050176	VK7JG	13/01/83	-
	TV506	6M CONVERTER	720089	VK2ZQW	11/01/90	-
	VFO520	EXTERNAL VFO		VK2DCB	16/08/84	-
KYOKUTO	FM144	VHF FM TRANSCEIVER	8296	VK2ZQW	11/01/90	-
KYOTO	FM144-10	2M FM TRANSCEIVER	5027	VK2KUR	24/09/84	CALLSIGN ENGRAVED
LEADER	LSG11	SIGNAL GENERATOR	0041244	VK3KJA	14/12/87	-
	LSG16	SIGNAL GENERATOR	1081098	VK3YSG	01/01/84	MISC BITS ALSO
MICROWAVE	40W-144 MHZ	2M LINEAR AMPLIFIER	-	VK2ZOW	11/01/90	-
MIRAGE	B1016	2M 160W PWR AMP	550779	VK3KAW	23/12/85	-
PHILLIPS	628	2M FM TRANSCEIVER	44982	VK4IS	15/08/90	10 CHANNELS - 3 FITTED
REALISTIC	AX190	HF RECEIVER	500111	VK3KJA	14/12/87	-
	SP190	SPEAKER ENCLOSURE	20-5191	VK3KJA	14/12/87	-
REGENCY	HX2000	HANDHELD		DSE VIC	13/05/85	-
SAIKO	SC7000	SCANNER		VK2XJC	15/05/85	BNC ANTENNA SOCKET
SONY	2001D	COMMUNICATIONS RECVR ?		VK2FZH	09/06/89	BROKEN ANTENNA
STANDARD	C520	2M & 70 CM HANDHELD	F140829	ANDREWS COMM	18/02/90	STOLEN AT GOSFORD FIELD DAY
TELEQUIP'T	551	OSCILLOSCOPE		VK4AAE	27/10/89	-
TEMPO	IS	2M HANDHELD	012240	VK3UB	06/06/87	-

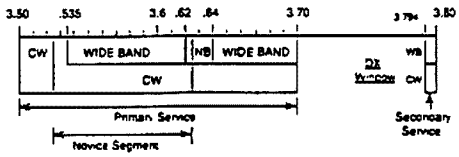
THORN		B&W TV	107512	VK2XJC	15/05/85	MOD FOR COMPUTER
TOKYO	HL160V	2M POWER AMPLIFIER	829331	VK2XJC	15/05/85	-
	HL86V	6M POWER AMPLIFIER	819595	VK2XJC	15/05/85	-
	HL90U	70CM POWER AMP	8304246	VK2XJC	15/05/85	-
TRIO	CS1560A2	CRO	10-20171	VK3YSG	01/01/84	-
UNIDEN	2020	HF TRANSCEIVER	50806009	VK2KSY	16/09/85	-
WELZ	SP200	SWR/PWR METER	600384	VK2XJC	15/05/85	-
YAESU	FAS14R	REMOTE ANT SEL	140138	VK3KJA	14/12/87	-
	FC707	ANTENNA TUNER	11140775	VK2DBB	28/04/86	-
	FC707	ANTENNA TUNER	1N180265	VK4AAE	27/10/89	-
	FC707	ANTENNA TUNER	11140765	VK3DHV	01/06/87	-
	FL2010	2M LINEAR AMPLIFIER	1L031300	VK3DKO	25/08/88	MOUNTED IN CRADLE
	FP707	POWER SUPPLY	4C050487	VK4AAE	27/10/89	-
	FP707	12V 20 AMP P/SUPPLY	1H120548	VK5ABY	22/12/88	-
	FRA7700	ACTIVE ANTENNA	2H050293	VK2???	11/11/87	-
	FRG7	HF RECEIVER	299L26099	VK3ZLY	28/07/83	-
	FRG7700	RECEIVER	2K210752	VK2???	11/11/87	-
	FRG7700	RECEIVER	3M260983	VK2XPU	01/08/89	-
	FHT7700	ANTENNA TUNER	2K070479	VK2???	11/11/87	-
	FT101B	HF TRANSCEIVER	83L102373	VK3KJA	14/12/87	-
	FT101E	HF TRANSCEIVER	8G350283	VK2SS	29/06/84	-
	FT101E	HF TRANSCEIVER	7K/301042	VK5EZ	08/07/89	-
	FT101E	HF TRANSCEIVER	8L370414	VK3DYZ	11/09/84	-
	FT107M	HF TRANSCEIVER	1I110012	VK2ALN	03/03/87	-
	FT200	HF TRANSCEIVER	2K332252	VK3DYZ	11/09/84	-
	FT207R	2M HANDHELD	1D132704	VK2ETJ	06/03/88	-
	FT207R	2M FM HANDHELD	10132725	VK2EMC	04/03/85	BATTERY COVER MISSING
	FT208R	2M FM HANDHELD	3N350964	VK2CBA	30/07/85	-
	FT208R	2M FM HANDHELD	4E382078	VK2PJ	29/03/89	FAULTY VCO
	FT209R	2M FM HANDHELD	4L06245	DSE VIC	13/05/85	-
	FT209RH	2M FM HANDHELD	4K050838	VK3CE	01/01/85	BLUE VINYL CASE
	FT209RH	2M FM HANDHELD	5K190401	VK2HW	21/02/86	LEATHER CASE
	FT224		6G307290	VK3OV	28/05/87	-
	FT227RA	2M FM TRANSCEIVER	8L021912	VK3ERG	06/10/90	-
	FT230	2M FM TRANSCEIVER		VK2EQD	18/08/87	-
	FT230R	2M FM TRANSCEIVER	4H081794	DSE VIC	13/05/85	-
	FT290R	2M FM TRANSCEIVER	2D100942	VK3DKO	25/08/88	CALLSIGN ENGRAVED
	FT290R	2M FM TRANSCEIVER	5G450016	VK7HW	18/04/88	MOBILE BRACKET
	FT290R	2M FM TRANSCEIVER	4E360554	VK3KGH	01/06/85	VINYL CASE
	FT290R	2M FM TRANSCEIVER	3C260713	VK2EGD	12/11/86	-
	FT290R	2M FM TRANSCEIVER	1L081321	VK3KJC	22/02/84	-
	FT290R	2M FM TRANSCEIVER	SF 280702	VK4AAE	27/10/89	COMPLETE WITH NICADS
	FT290R	2M FM TRANSCEIVER	1M081340	VK2VE	04/01/87	OWNERS NAME
	FT480R	2M ALL MODE T/CEIVER	1H12069	VK1ZUR	29/05/84	-
	FT620	6M TRANSCEIVER	010489	VK4ZSH	03/09/85	-
	FT680R	HF TRANSCEIVER	3H080202	VK2XJC	15/05/85	-
	FT7	HF TRANSCEIVER	8K110846	VK2IV	04/11/88	DIAL ILLUMINATION MODIFICATION
	FT7	HF TRANSCEIVER	8I090728	VK2KSY	16/09/85	-
	FT7	HF TRANSCEIVER	81090839	VK3BYK	28/06/83	-
	FT707	HF TRANSCEIVER	-	VK4AAE	27/10/89	-
	FT707	HF TRANSCEIVER	1D161414	VK3DHV	01/06/87	-
	FT708R	70CMS FM HANDHELD	2J181463	VK2PJ	29/03/89	-
	FT708R	70CM FM HANDHELD	1H010948	VK2PJ	20/04/85	CALLSIGN ENGRAVED
	FT757GX	T/CVR & YM38 MIC	3N040371	VK2DBB	28/04/86	CALL SIGN ENGRAVED
	FT780R	70CM TRANSCEIVER	1J061616	VK3ZBI	01/10/85	-
	FT780R	70CM TRANSCEIVER	3F070521	VK2XJC	15/05/85	-
	FV101	EXTERNAL VFO	1E353	VK3KJA	14/12/87	-
	FV707DM	EXTERNAL DIGITAL VFO	0L060097	VK4AAE	27/10/89	-
	Y901P	MONITORSCOPE	9L030072	VK1ZVR	15/12/84	INCLUDING MODULES
	YC-355D	200MHZ FREQ COUNTER	-	VK2ZQW	11/01/90	-
	YP150	DUMMY LOAD	81090469	VK2DCB	16/08/84	-

Australian Band Plans (HF)

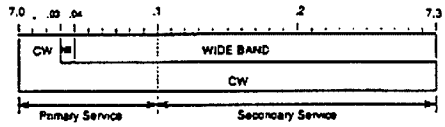
The 160 Metre Band
1800 - 1875 CW
1810 - 1815 Narrow Band Modes
1815 - 1875 Wide Band Modes
1815 - 1835 DX Window
1870 +/- 4 kHz avoid these frequencies



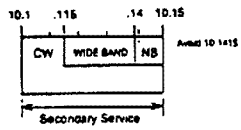
The 80 Metre Band
3500 - 3700 CW
3525 - 3625 Novice Segment
3535 - 3620 Wide Band Modes
3620 - 3640 Narrow Band Modes
3640 - 3700 Wide Band Modes
3794 - 3800 DX Window
3794 +/- 1 kHz avoid this frequency



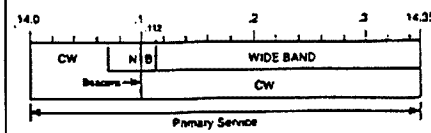
The 40 Metre Band
7000 - 7300 CW
7030 - 7040 Narrow Band Modes
7040 - 7300 Wide Band Modes



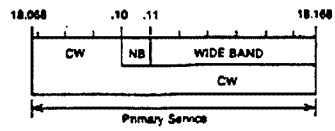
The 30 Metre Band
10.100 - 10.150 CW
10.115 - 10.140 Wide Band Modes (VK only)
10.140 - 10.150 Narrow Band Modes
10.1415 +/- 4 kHz avoid these frequencies



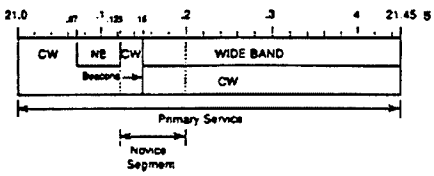
The 20 Metre Band
14.000 - 14.350 CW
14.070 - 14.112 Narrow Band Modes
14.095 - 14.112 Packet Radio
14.112 - 14.350 Wide Band Modes
14.100 +/- 500 Hz Beacon guard band
14.230 SSTV calling frequency
14.250 FAX calling frequency



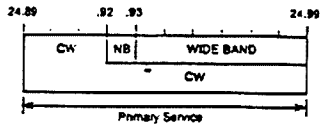
The 17 Metre Band
18.068 - 18.168 CW
18.100 - 18.110 Narrow Band Modes
18.110 - 18.168 Wide Band Modes



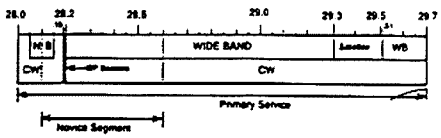
The 15 Metre Band
21.000 - 21.450 CW
21.070 - 21.125 Narrow Band Modes
21.125 - 21.150 CW
21.125 - 21.200 Novice segment
21.150 - 21.450 Wide Band Modes
21.150 +/- 500 Hz IBP Beacon Guard Band
21.340 +/- 5 kHz SSTV



The 12 Metre Band
24.890 - 24.990 CW
24.920 - 24.930 Narrow Band Modes
24.930 - 24.990 Wide Band Modes



The 10 Metre Band
28.000 - 29.700 CW
28.050 - 28.150 Narrow Band Modes
28.100 - 28.600 Novice segment
28.150 - 28.190 CW
28.190 - 28.200 IBP Beacon Segment
28.200 - 28.300 Existing beacons
28.200 - 29.300 Wide Band Modes
28.680 +/- 5 kHz SSTV
29.300 - 29.510 Satellite Downlink
29.510 - 29.700 Wide Band (FM)
29.520 - 29.580 Repeater Inputs
29.600 Simplex
29.620 - 29.680 Repeater Outputs



Australian Band Plans:

The VHF Bands

The VHF Band Plans were revised in October 1990 by the extension of the EME segment on bands above 6 metres, moving the CW calling frequency to .050 on 2 metres and above, and adopting expanded packet radio segments on the 2 metre and 70 cm bands. The 6 metre plan has been revised to allow for 50 MHz beacons in VK5, VK6 and VK8.

On higher bands, a revision has been made to the 23 cm band plan to reinstate a VSB ATV channel at 1285 - 1292 MHz, and this has caused in a slight shift of the Simplex Voice and Digital seg- ments. Proposed new band plans for 2300 MHz and above were pub- lished in October 1990 "Amateur Radio" and are reproduced here. These will be presented for adoption in February 1991.

General

1. Narrow Band Segments

On each VHF/UHF band a segment of up to 1 MHz is reserved for narrow band modes and weak signal operation, in- cluding segments for CW, EME, DX operation, and beacons. This segment begins at the following frequency on each band:

6 metres:	52 MHz	9 cm:	3456 MHz
2 metres:	144 MHz	6 cm:	5760 MHz
70 cm:	432 MHz	3 cm:	10368 MHz
23 cm:	1296 MHz	1 cm:	24192 MHz
13 cm:	2304 MHz	6 mm:	47088 MHz

2. DX Only Segment

On all bands the segment up to .100 is reserved for DX operation only, using narrow band modes (CW, FSK, SSB etc), with bandwidths up to 3 kHz. This seg- ment also contains an exclusive EME sub- band. The space reserved for EME is as follows:

6 metres:	52.000 - 52.010	23 cm:	1295.900 - 1296.050
2 metres:	144.000 - 144.050	13 cm:	2303.900 - 2304.050
70 cm:	431.950 - 432.050		

For the higher bands, the EME segment is 3456 q 100 kHz, 5760 q 100 kHz etc.
Calling frequencies within the DX Only segment are:
CW: 52.025, 144.050, 432.050, 1296.050 , 2304.050
Random M/S:52.050
RTTY (FSK): 52.075 144.075 432.075, 1296.075, 2304.075

3. General Phone/CW Segment

Above the DX Only segment on each band is a General Phone/CW seg- ment for all modes up to 6 kHz bandwidth. This includes three calling frequencies: .100 SSB/CW calling frequency (primary) .200 SSB/CW calling frequency (secon- dary) .300 SSTV calling frequency

On all bands the .100 calling frequency is used as a primary DX frequency, and the .200 frequency is commonly used for aircraft enhancement and other DX op- eration. On 50 MHz, the international DX calling frequency is 50.110 MHz. Calling frequencies for FM voice, RTTY, SSTV etc are located in the FM Simplex segments of each band.

On the bands above 2.3 GHz, there are only two all-mode calling frequencies:

.100 Primary / DX/

.200 Secondary / Local calling frequen- cies are used to make initial contact, then move to another frequency. Prolonged contacts or test transmissions on calling frequencies are anti-social - others may be waiting to make (or hear) a call.

4. Beacon Segments

The primary beacon segment on each band is .400 - .500. On 6 metres only, the secondary segment is 52.300 - 52.400 MHz. On all other bands, the secondary beacon segment is .500 - .600. Beacons are allocated according to a call area allocation plan, with the 10 kHz digits of the frequency indicating the call area.

The allocation of the primary segment is as follows:

VK0: .400 - .409	VK4: .440 - .449
VK7: .470 - .479	VK1: .410 - .419
VK5: .450 - .459	VK8: .480 - .489
VK2: .420 - .429	VK6: .460 - .489
VK9: .490 - .499	VK3: .430 - .439

The pattern is the same for the secon- dary segment. The present 5 kHz chan- nelling provides a total of four clear chan- nel beacon frequencies per call area.

On 50 MHz, 50.056 MHz is reserved for time-shared beacons north of the Tropic of Capricorn, and 50.066 MHz south of the Tropic. A segment for con- tinuous duty beacons in VK5, VK6 and VK8 has also been adopted - see the 6 metre band plan for details.

5. General Use Segments

On all bands except 6 metres there is a "General Use" segment im- mediately above the beacon segment. This is used for any pur- pose, such as local or club nets, experimental work, liaison etc. On some bands this segment may include frequencies reserved for Packet Radio, CW practice beacons and other uses.

NARROW-BAND SEGMENTS:

Fig. 1: 2M - 13 CM Bands

.000 - .100	DX ONLY
.900 - .100	EME
.100 - .400	TERRESTRIAL
.100	Primary (DX) calling freq
.200	Secondary (local) calling freq
.400 - .500	BEACONS - primary
.500 - .600	BEACONS - seoon- dary
.600 - .000	GENERAL USE, NB modes

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The following items are available from your Division's Bookshop
(see the WIA Divisions Directory on page 3 for the address of your Division)

	Ref	Prics to Members
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Antenna Compendium Vol 1 ARRL	BX163	$19.80
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Antenna Compendium Vol 2 ARRL	BX292	$21.60
Antenna Handbook -Orr	8X217	$15.57
Antenna Impedance Matching - ARRL	BX257	$27.00
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Antenna Pattern Worksheets Pkt of 10 - ARRL	BX211	$5.40
Antennas 2nd ed John Kraus	BX259	$93.60
Beam Antenna Handbook - New ED. 1990 Orr	BX215	$17.37
Cubical Quad Antennas - Orr	BX214	$13.05
HF Antennas - Moxon RSGB	BX188	$27.00
Novice Antenna Notebook OeMaw - ARRL	BX162	$14.40
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Reflections - Transmission lines The Book - ARRL	BX348	$36.00
Smith Chart Expanded Scale PK of 10	BX903	$5.94
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The Antenna Handbook - ARRL	BX161	$32.40
The Truth About CB Antennas - Orr	BX219	$15.57
Transmission Line Transformers - ARRL	BX329	$36.00
Vertical Antenna Handbook - Lee	BX284	$16.65
Vertical Antennas - Orr	BX220	$14.27
Yagi Antenna Design - ARRL	BX164	$27.00
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Micro and Television Projects - BATC	BX272	$9.45
The ATV Compendium - BATC	BX270	$15.75
The Best Of CQ-TV - BATC	BX273	$15.75
The Slow Scan Companion - BATC	BX274	$11.70
TV For Amateurs - BATC	BX271	$8.32
CALL BOOKS		
Radio Call Book International 1991	BX339	$56.25
Radio Call Book North America 1991	BX338	$52.65
Radio Call Book Supplements 1991 Due June	8X364	$15.75
FICTION		
CQ Brings Danger - ARRL	BX206	$9.45
CQ Ghost Ship - ARRL	BX204	$9.45
Death Valley QTH- ARRL	BX205	$9.45
Grand Canyon QSO - ARRL	BX207	$9.45
Murder By QRM - ARRL	BX208	$9.45
SOS At Midnight - ARRL	BX209	$9.45
Space Almanac - ARRL	BX299	$36.00
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1991 ARRL Handbook	BX337	$47.61
Electronics Data Book - ARRL	BX201	$21.60
Motorola RF Device Data - 2 Volumes	BX47	$22.05
Operating Manual - ARRL	BX192	$27.00
Operating Manual - RSGB	BX359	$25.20
Radio Communication Handbook - RSGB	BX266	$50.40
Radio Data Reference Book - RSGB	BX189	$32.40
Radio Handbook 23rd edition - Bill Orr	BX224	$53.91
Radio Theory For Amateur Operators - Swainston	BX265	$38.66
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200 Meters and Down 1936 - ARRL	BX198	$7.20
50 Years of the ARRL	BX196	$7.20
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	Ref	Price to Members
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Interference Handbook - Nelson	BX181	$16.02
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Morse Code The Essential Language - ARRL	BX223	$9.00
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Amateur Radio Awards Book - RSGB	BX297	$27.00
DXCC Companion	BX345	$10.80
Low Band DXing - John Devoldere	BX195	$18.00
Maidenhead Locator-Grid Atlas - ARRL	BX197	$9.00
Prefix Map - The World Flat on Heavy Paper	BX335	$14.40
Prefix Map of North America	BX235	$7.20
Prefix Map of The World	BX234	$7.20
Radio Amateurs World Map	BX236	$7.20
The Complete DXer - Bob Locher	BX194	$18.00
Transmitter Hunting - TAB	BX222	$32.31
PACKET RADIO BOOKS		
AX.25 Link Layer Protocol - ARRL	BX178	$14.40
Computer Networking Con (Packet)		
Computer Networking Con (Packet) No 5 1986 - ARRL	BX167	$18.00
Computer Networking Con (Packet) No 6 1987 - ARRL	BX168	$18.00
Computer Networking Con (Packet) No 7 1988 - ARRL	BX184	$22.50
Computer Networking Con (Packet) No 8 1989 - ARRL	BX295	$21.60
Computer Networking Con (Packet) No 9 1990 - ARRL	BX360	$21.60
Computer Networking Conf (Packet) 1-4 1982/5	BX166	$32.40
Gateway to Packet Radio 2nd edition - ARRL	BX169	$21.60
Packet Radio Made Easy - Rogers	MFJ32	$18.45
Packet Users Notebook - Rogers	BX285	$16.65
SATELLITE BOOKS		
Oscar Satellite Review - Ingram	MFJ31	$15.30
Satellite AMSAT-NA 5th Symposium 1987 - ARRL	BX182	$15.75
Satellite AMSAT-NA 6th Symposium - ARRL	BX199	$15.75
Satellite Anthology - ARRL	BX180	$14.40

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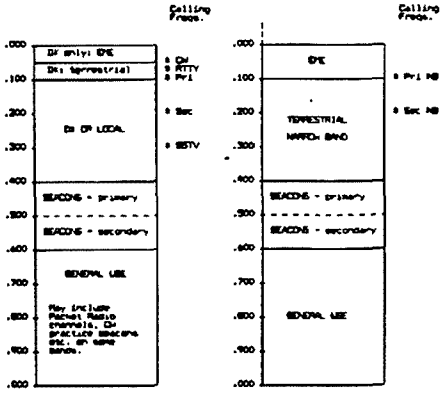
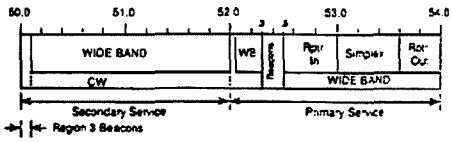
If the item is carried by your Divisional Bookshop, but is not in stock, your order wil be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.



The 6 Metre Band: 50 - 54 MHz

Allocations in this band are as follows:
50-52 MHz: Broadcasting primary service, Amateur secondary (see Note 1)
52-54 MHz: Amateur primary service.



50.000 - 52.000	RESTRICTED USE SEGMENT (Note 1)
50.000 - 50.100	CW only
50.100 - 52.000	CW/Phone
50.110	International DX Calling Frequency
50.250 - 50.300	Beacons (VK6/8/9 only - Note 2)
52.000 - 52.500	NARROW BAND MODES
52.000 - 52.010	DX only: EME
52.010 - 52.050	DX only: CW
52.025	CW calling frequency
52.050- 52.100	DX only: Phone/CW
52.050	DX M/S calling frequency
52.075	RTTY (FSK) calling frequency
52.100 - 52.300	General CW/Phone
52.100	Calling Frequency (primary national)
52.200	Calling Frequency (secondary national)
52.300	Calling Frequency: SSTV
52.300 - 52.400	Beacons: secondary segment (Note 2)
52.400 - 52.500	Beacons: primary segment (Note 2)
52.500 - 52.600	FM SIMPLEX AND REPEATERS
52.525	International FM Simplex Calling Frequency
52.550 - 52.975	Repeater inputs (Note 3)
53.000 - 53.100	Simplex: data transmission
53.000	BBS forwarding
5 53.025	General use
53.050	General use
53.075	General use
53.100	General use
53.125 - 53.525	Simplex: voice
53.500	National voice calling frequency
53.550 - 54.000	Repeater outputs (Note 3)

Note 1: 50 - 52 MHz Operating Conditions

This portion of the band is allocated on a primary basis to the Broadcasting Service and on a secondary basis to the Amateur Service. DoTC permits amateur stations to operate within this band under the following conditions:

(a) No interference is caused to the reception of Channel 0 transmissions;

(b) In New South Wales, Victoria, Queensland and Tasmania, operation is restricted to:

(i) The sub-band 50.05 - 50.20 MHz;

(ii) Locations outside the following minimum radial dis- tances from: Television Channel 0 main stations: 120 km Television Channel 0 translator stations: 60 km Television translator stations with Channel 0 inputs: 60 km

(iii) Emission mode 200HA1A with a maximum transmitter power of 100 watts pY;

(iv) Emission mode 4K00J3E with a maximum transmitter power of 100 watts pX.

(c) In the Australian Capital Territory, operation is restricted to:

(i) The sub-band 50.05 - 50.20 MHz;

(ii) Emission mode 200HA1A with a maximum transmitter power of 100 watts pY;

(iii) Emission mode 4K00J3E with a maximum transmitter power of 100 watts pX.

Note 2: Beacon Operation

Beacon frequencies on 52 MHz are allocated in accordance with the beacon plan on a state basis, i.e. VK1: 52.410 - 52.419, VK2: 52.420 - 52.429 etc. The current 5 kHz channelling provides four channels per call area.

Beacons within the 50 MHz "DX window" (50.050 - 50.200) are con- fined to time sharing on 50.056 MHz (north of the Tropic of Capricorn) and 50.066 MHz (south of the Tropic of Capricorn).

Continuous duty beacons in VK5/6/8/9 may operate outside the 50.050 - 50.200 MHz segment. The following plan was adopted for such beacons in October 1990:

VK5:	VK6:	VK7:	VK8:	VK9:
50.250	50.260 *	50.270	# 50.280	* 50.290
50.252 *	50.262	50.272 *	# 50.282	50.292 *
50.254	50.264 *	50.274	# 50.284	* 50.294
50.256 *	50.266	50.276 *	# 50.286	50.296 *
50.258	50.268 *	50.278	# 50.288	* 50.298

* Channels at 4 kHz increments to be allocated first.

This segment (not of course available in VK7) to be used if needed for beacons in other call areas.

Note 3: Repeaters

The repeater split is 1 MHz and the channel spacing is 25 kHz. Seven repeater channels are allocated for exclusive use in the following call areas:

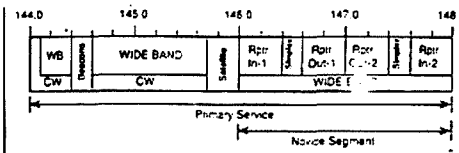
VK1: 52.70	/ 53.70	VK5: 52.75	/ 53.75
VK2: 52.85	/ 53.85	VK6: 52.80	/ 53.80
VK3: 52.90	/ 53.90	VK7: 52.65 / 53.65	
VK4: 52.95	/ 53.95	VK8: as for VK5	

The remaining channels are available for use in any call area. Repeater channel allocations are co-ordinated nationally to reduce the possibility of interstate sporadic E interference.

The 2 Metre Band: 144 - 148 MHz

This band is allocated to the Amateur Service on a primary basis, and the Amateur Satellite Service is also allocated 144 - 146 MHz. Novices have the use of 146 - 148 MHz for 16K0F3E (FM) emissions only.

144.000 - 144.600	NARROW BAND MODES
144.000 - 144.050	DX only: EME
144.050 - 144.100	DX only: Terrestrial



144.050	CW calling frequency
144.075	RTTY (FSK) calling frequency
144.100 - 144.400	General CW/Phone
144.100	Calling Frequency: primary national
144.200	Calling Frequency: secondary national
144.300	Calling Frequency: SSTV
144.400 - 144.500	Beacons: primary segment
144.500 - 144.600	Beacons: secondary segment
144.600 - 145.700	GENERAL USE, all modes
144.700 - 144.925	Packet Radio: 10 channels at 25 KHz spacing
144.950 - 144.975	CW Practice Beacons: 2 channels
145.700 - 146.000	AMATEUR SATELLITES
146.000 - 148.000	FM SIMPLEX AND REPEATERS (Notes 1, 2, 3)
146.025 - 146.400	Repeater inputs - group A
146.425 - 146.600	Simplex (Note 4)
146.625 - 147.000	Repeater outputs - group A
147.025 - 147.375	Repeater outputs - group B
147.400 - 147.600	Simplex (Note 4)
147.625 - 147.975	Repeater inputs - group B

Note 1: FM Repeaters

Channel spacing is 25 KHz, and repeater offset is 600 KHz. In some areas it may be necessary to reverse repeater inputs and outputs in order to avoid interference from pagers.

Note 2: Repeater Linking

Regulations require the use of tone access for 2 metre repeaters linked to repeaters in other bands, to prevent the possibility of Novice transmissions being relayed on frequencies they are not entitled to use. The following CTCSS tones have been adopted for repeater access:

123 Hz: For access to linked repeaters where CTCSS tone squelch is fitted as a means of preventing intermodulation interference.

141.3 Hz: For use by full or limited licensees to activate links to other VHF/UHF bands. This tone will also perform the same function as the 123 Hz tone.

Note 3: Special Purpose Repeater Channels

The following repeater channels are reserved for special uses:

ATV liaison:	147.300 MHz	
RTTY:	147.325 MHz	147.350 MHz

Note 4: Special Purpose Simplex Channels

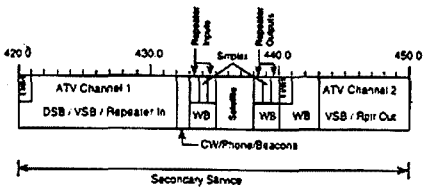
The following simplex channels are reserved for special uses:

146.450	Primary national voice
146.500	National voice calling frequency (primary).
146.550	Primary national voice
146.600	RTTY.
147.400	ATV liaison.
147.425	ATV liaison.
147.450	ATV/SSTV/FAX.
147.475	SSTV/FAX liaison.
147.500	National voice calling frequency (secondary)
147.550	Micro nets.
147.575	Data/packet nets.
147.600	Data/packet nets.

The 70 cm Band: 420 - 450 MHz

This band is allocated to the following services:

Service	Band	Status
Radiolocation	420 - 450	Primary
Fixed, Mobile	420 - 450	Secondary
Amateur	420 - 450	Secondary Amateur
Satellite	435 - 438	Secondary



420.000 - 421.000	REPEATER LINKS - "A" pairs
421.000- 431.950	AMATEUR TELEVISION
Channel 1 - VSB/DSB (simplex or repeater in- put)	
426.250	Video carrier
431.750	Audio carrier
431.950 - 432.600	NARROW BAND MODES
431.950 - 432.050	DX only: EME
432.050 - 432.100	DX only: Terrestrial
432.050	CW calling frequency
432.075	RTTY (FSK) calling frequency
432.100 - 432.400	General CW/Phone
432.100	Calling Frequency: primary national
432.200	Calling Frequency: secondary national
432.300	Calling Frequency: SSTV
432.400 - 432.500	Beacons: primary segment
432.500 - 432.600	Beacons: secondary segment
432.600- 433.000	GENERAL USE, all modes
433.000 - 435.000	FM SIMPLEX AND REPEATERS (Notes 1 and 2)
433.025 - 433.725	Repeater inputs
433.750 - 434.250	Simplex (Note 3)
434.275 - 434.975	Repeater inputs
435.000 - 438.000	AMATEUR SATELLITES
438.000 - 440.000	FM SIMPLEX AND REPEATERS (Notes 1 and 2)
438.025 - 438.725	Repeater outputs
438.750 - 439.250	Simplex (Note 3)
439.275 - 439.975	Repeater outputs
440.000 - 441.000	REPEATER LINKS - "B" pairs
441.000 - 443.000	WIDE BAND & EXPERIMENTAL all modes
443.000 - 450.000	AMATEUR TELEVISION Channel 2 - VSB (simplex or repeater output)
444.250	Video carrier
449.750	Audio carrier

Note 1: Repeater Operation

Channel spacing is 25 KHz, and repeater offset is 5 MHz. For details of repeater linking tone access, see Note 2 for the 2 metre band.

Note 2: Special Purpose Repeater Channels

The following repeater channels are reserved for special uses:

Mobile voice primary:	438.525			
Mobile voice secondary:				
	438.075	438.225		
	438.375	438.675		
Mobile voice (other):	438.025	438.175	438.325	438.425
	438.475	439.275	439.425	439.575
	439.725	439.875		
WICEN portable:	438.275	438.625		
RTTY:	438.125	438.725	439.325	439.475
Data:	438.575			
SSTV:	439.975			

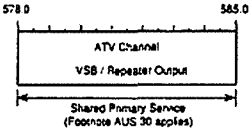
Note 3: Special Purpose Simplex Channels

The following simplex channels are reserved for special uses:

National voice call channel:	439.000			
Secondary voice channels:	438.825	439.125		
WICEN:	438.800			
RTTY:	438.775			
Data and Packet:	439.050	439.075	439.200	439.225
	439.250	434.050	434.075	434.200
	434.225	434.250		
SSTV:	438.925			

The 50 cm Band: 576 - 585 MHz Only existing ATV repeaters will be permitted in this band following its withdrawal from the Amateur Service in 1989.

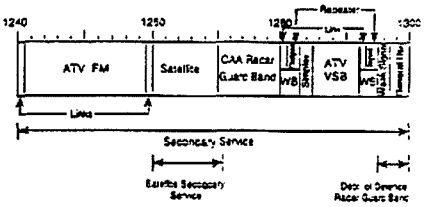
578.000 - 585.000	AMATEUR TELEVISION, VSB repeater output
579.250	Vision carrier 564.750 Sound carrier



The 23 Cm Band: 1240 - 1300 MHz

This band is allocated to the following services:

Service	Band	Status
Radiolocation	1240-1300	Primary
Radionavigation - Satellite	1240-1260	Primary
Amateur	1240-1300	Secondary
Amateur Satellite (uplinks)	1260-1270	Secondary



1241.000- 1241.000	REPEATER LINKS
1241.000- 1259.000	AMATEUR TELEVISION (Note 5)
1259.000- 1280.000	REPEATER LINKS
1260.000- 1270.000	AMATEUR SATELLITES (uplinks only)
1270.000- 1280.000	GENERAL USE (Radar guard band - Note 1)
1280.000- 1281.975	REPEATER LINKS
1281.000- 1285.000	FM SIMPLEX AND REPEATERS
1281.000- 1283.975	Repeater outputs (Note 2)
1283.000- 1283.975	Simplex - Digital and Packet Radio (Note 4)
1284.000- 1284.975	Simplex - Voice (Note 3)
1285.000- 1292.000	AMATEUR TELEVISION - VSB AM (Note 5)
1286.250	Video carrier
1291.750	Audio carrier
1292.000- 1293.975	REPEATER LINKS
1293.000- 1294.975	FM REPEATER INPUTS (Note 2)
1295.000- 1297.000	NARROW BAND MODES (Radar guard band - Note 1)
1295.900- 1296.050	DX only: EME
1296.050- 1296.100	DX only: Terrestrial
1296.050	CW calling frequency
1296.075	RTTY (FSK) calling frequency
1296.100- 1296.400	General Phone/CW
1296.100	Calling frequency: primary national
1296.200	Calling frequency: secondary national
1296.300	Calling frequency: SSTV
1296.400- 1296.500	Beacons: primary segment
1296.500- 1296.600	Beacons: secondary segment
1296.600- 1297.000	General use, all narrow band modes
1297.000- 1300.000	ALL MODES (Note 1)

Note 1: Radar Guard Bands

Some Department of Aviation RADARS are centred on 1275.0 and 1305.0 MHz, while some Department of Defence RADARs are centred on 1300.0 MHz. Accordingly the frequencies 1270 - 1280 MHz and 1295 - 1300 MHz are allocated as guard bands. The Department of Aviation RADARS on 1275 MHz are to phased out by 1992.

Note 2: FM Repeater Operation

Channel spacing is 25 KHz, and repeater offset is 12 MHz. Certain channels are reserved for particular uses as follows:

Mobile Voice:	ll multiples of 100 KHz from 1281.100 1 o 1283.000.			
Primary:	1281.500			
Secondary:	1281.400	1281.800		
RTTY:	1281.050	1281.150	1282.150	262.250
Data:	1281.250	1281.350	1282.350	
1282.450				
ATV Liaison:	1281.850	1281.950		

Other channels may be used for any purpose. It is suggested that the channels 1282.500 - 1282.975 and 1293.500 - 1283.975 be reserved for possible use by linear transponders.

Note 3: FM Simplex Channels

Channel spacing is 25 kHz. Channel allocation is as follows:

1284.000 - 1284.075
RTTY 4 channels
1284.100 - 1284.175
ATV liaison/SSTV 4 channels
1284.200 - 1284.775
General voice 24 channels
1284.500
Primary calling frequency
1284.800 - 1284.875
Local, club or special purpose nets
1284.900 - 1284.975
WICEN

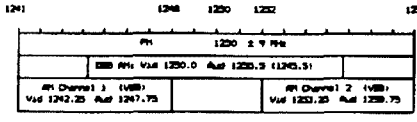
Note 4: Digital and Packet Radio

Channel allocations will be finalised after discussion with packet radio groups. A tentative allocation is:

1283.100 - 1283.500
Speeds over 9600 baud
5 channels at 100 kHz spacing
1283.600 - 1283.975
Speeds up to 9600 baud
16 channels at 25 kHz spacing

Note 5: Recommended ATV Frequencies

The 1241 - 1259 MHz segment can be used for FM ATV (video carrier 1250 MHz) or for AM operation. Suggested uses of this segment are:



The 1285 - 1292 MHz channel is suitable for VSB AM only.

The 13 Cm Band: 2300 - 2450 MHz

This band is allocated to the following services:

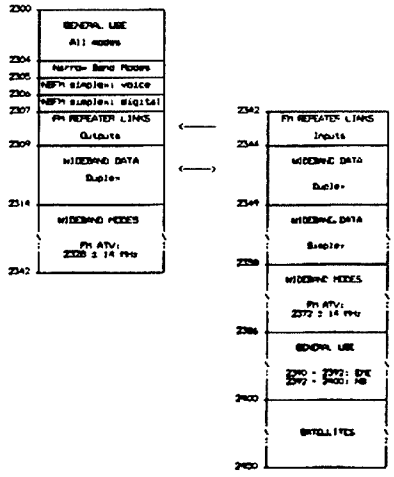
Service	Band	Status
Fixed, Mobile	2300 - 2450	Primary
Radiolocation	2300 - 2450	Primary
Industrial/Scientific/Medical	2400 - 2450	
Primary Amateur	2300 - 2450	Secondary
Amateur Satellite	2400 - 2450	Secondary

The band also contains MDS television links, with channels at 7 MHz spacing on centre frequencies from 2305.5 MHz to 2396.5 MHz. The first six channels (effectively 2302 - 2344 MHz) are unallocated but are reserved for future use.

The following band plan is proposed for adoption in February 1991.

2300.000- 2303.900	GENERAL USE, all modes
2303.900- 2305.000	NARROW BAND MODES
2303.900- 2304.050	DX only: EME
2304.050- 2304.100	DX only: Terrestrial

2304.050	CW calling frequency
2304.075	RTTY (FSK) calling frequency
2304.100 - 1296.400	General Phone/CW
2304.100	Calling frequency: primary national
2304.200	Calling frequency: secondary national
2304.400 - 2304.500	Beacons: primary segment
2304.500 - 2304.600	Beacons: secondary segment
2304.600 - 2305.000	General use, all narrow band modes
19 2305.000 - 2306.000	FM SIMPLEX - voice 25 KHz channeling
2306.000 - 2307.000	FM SIMPLEX - digital 25 KHz channeling
2307.000 - 2309.000	FM REPEATER LINK OUTPUTS 35 MHz offset
2309.000 - 2314.000	WIDEBAND MODES
2309.000 - 2314.000	Data: duplex - 35 MHz offset
2314.000 - 2342.000	FM ATV Channel 1
2328 +/- 14 MHz	
2342.000 - 2344.000	FM REPEATER LINK INPUTS 35 MHz offset
2344.000 - 2386.000	WIDEBAND MODES
2344.000 - 2349.000	Data: duplex 35 MHz offset
2349.000 - 2358.000	Data: simplex
2358.000 - 2386.000	FM ATV Channel 2 2372 +/- 14 MHz
2386.000 - 2400.000	GENERAL USE, all modes
2390.000 - 2392.000	Region 1 EME window
2392.000 - 2400.000	Narrow band modes: segment to be adopted consistent with proposed Region 1/2 NB segment.
2400.000 - 2450.000	AMATEUR SATELLITES (downlinks)



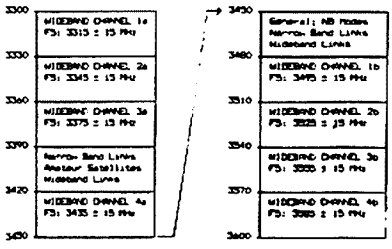
The 9 cm Band: 3300 - 3600 MHz

This band is allocated to the following services:

Service	Band	Status
Radiolocation	3300 - 3600	Primary
		Amateur
	3300 - 3600	Secondary
Amateur Satellite (Regions 2 & 3)	3400 - 3410	Secondary
Fixed Satellite (space to earth)	3400 - 3600	Secondary
Fixed	3400 - 3600	Secondary
Mobile		
	3400 - 3600	Secondary

The scope of amateur activity in this band is limited by the need to avoid interference to other services. A large portion of the band is allotted to wideband "channels", each 30 MHz wide, for FM ATV and other wideband uses. These channels can be paired for duplex operation with IF frequencies at any multiple of 30 MHz up to 180 MHz.

The following band plan is proposed for adoption in February 1991.



21 3300.000 - 3400.000	WIDEBAND MODES
3300.000 - 3330.000	Wideband channel 1a 3315 ± 15 MHz
3330.000 - 3360.000	Wideband channel 2a 3345 ± 15 MHz
3360.000 - 3390.000	Wideband channel 3a 3375 ±15 MHz
3390.000 - 3400.000	FM LINKS - narrow band 70 MHz offset
3400.000 - 3410.000	AMATEUR SATELLITES (Regions 2 and 3)
3410.000 - 3440.000	WIDEBAND MODES
3410.000 - 3420.000	Links 60 MHz offset
3420.000 - 3450.000	Wideband channel 4a 3435 ±15 MHz
3450.000 - 3455.900	General use
3455.900 - 3457.000	NARROW BAND MODES
3455.900 - 3456.100	EME only
3456.100 - 3456.400	Terrestrial
3456.100	Calling frequency: all mode primary/ DX
3456.200	Calling frequency: all mode secondary/ local
3456.400 - 3456.500	Beacons: primary segment
3456.500 - 3456.600	Beacons: secondary segment
3456.600 - 3457.000	General use, all narrow band modes
3457.000 - 3458.000	FM SIMPLEX - voice
3458.000 - 3460.000	FM SIMPLEX - digital
3460.000 - 3470.000	FM LINKS - narrow band 70 MHz offset
3470.000 - 3600.000	WIDEBAND MODES
3470.000 - 3480.000	Links 60 MHz offset
3480.000 - 3510.000	Wideband channel 1b 3495 ± 15 MHz
3510.000 - 3540.000	Wideband channel 2b 3525 ± 15 MHz
3540.000 - 3570.000	Wideband channel 3b 3555 ± 15 MHz
3570.000 - 3600.000	Wideband channel 4b 3585 ± 15 MHz

The 6 cm Band: 5650 - 5850 MHz

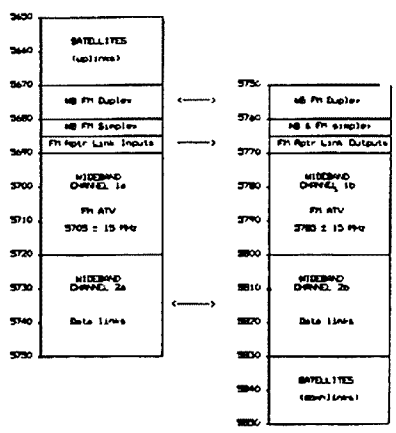
This band is allocated to the following services:

Service	Band	Status
Radiolocation	5650 - 5850	Primary
Amateur	5650 - 5850	Secondary
Space Research (deep space)	5650 - 5725	Secondary

Two 20 MHz segments are allotted for amateur satellites: 5650 - 5670 MHz for uplinks and 5830 - 5850 MHz for downlinks. Amateur stations are required to accept any harmful interference that may be experienced from the operation of industrial, scientific or medical (ISM) equipment.

The following band plan is proposed for adoption in February 1991. It incorporates a narrow band segment at 5760 MHz, and makes provision for four wideband segments, each 30 MHz wide with 80 MHz separation.

5650.000 - 5670.000	AMATEUR SATELLITES (uplinks)
5670.000 - 5760.000	WIDEBAND MODES (note 1)
5670.000 - 5680.000	FM duplex 80 MHz offset
5680.000 - 5685.000	FM simplex
5685.000 - 5690.000	FM REPEATER LINK IN- PUTS 80 MHz offset
5690.000 - 5760.000	WIDEBAND MODES
5690.000 - 5720.000	Channel 1a: FM ATV 5705 ±15 MHz
5720.000 - 5750.000	Channel 2a: Data links 5735 ±15 MHz
5750.000 - 5760.000	FM duplex 80 MHz offset
5759.900 - 5761.000	NARROW BAND MODES
5759.900 - 5760.100	EME only
5760.100 - 5760.400	Terrestrial
5760.100	Calling frequency: all mode primary/ DX
5760.200	Calling frequency: all mode secondary/ local
5760.400 - 5760.500	Beacons: primary segment
5760.500 - 5760.600	Beacons: secondary segment
5760.600 - 5761.000	General use, all narrow band modes
5761.000 - 5763.000	FM SIMPLEX - narrow band voice
5763.000 - 5765.000	FM SIMPLEX - narrow band digital
5765.000 - 5770.000	FM REPEATER LINK OUTPUTS 80 MHz offset
5770.000 - 5830.000	WIDEBAND MODES
5770.000 - 5800.000	Channel 1b: FM ATV 5785 ±15 MHz
5800.000 - 5830.000	Channel 2b: Data links 5815 ± 15 MHz
5830.000 - 5850.000	AMATEUR SATELLITES (downlinks)



Note 1: Possible future NB segment in the 5670 MHz region to conform to Region 1 proposal.

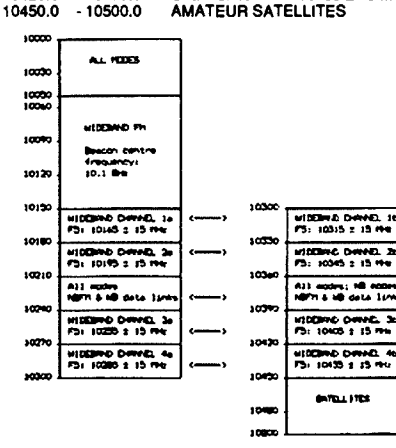
The 3 cm Band: 10 - 10.5 GHz

This band is allocated to the following services:

Service	Band	Status
Radiolocation	10.0 - 10.5 GHz	Primary *
Amateur	10.0 - 10.5 GHz	Secondary
Amateur Satellite	10.45 - 10.5 GHz	Secondary

The following band plan is proposed for adoption in February 1991. It makes provision for a narrow band modes segment, on the pattern of the lower bands, beginning at 10368 MHz, and segments for repeater and data links. There is also a series of channels, each 30 MHz wide, for wideband video, voice or data uses. These channels can be used for simplex operation or paired for duplex operation with IF frequencies at any multiple of 30 MHz up to 150 MHz. An IF in the 144-148 MHz band is also possible using a 150 MHz spaced channel pair. Very wide band systems (± 30 MHz) could operate on 10180, 10270, 10330 or 10420 MHz.

10000.0	- 10050.0	ALL MODES	
10050.0	- 10150.0	WIDEBAND FM	
10100.0		Centre frequency for wideband beacons	
10150.0	- 10210.0	WIDEBAND MODES	
10150.0	- 10180.0	Channel 1a	10165 ± 15 MHz
10180.0	- 10210.0	Channel 2a	10195 ± 15 MHz
10210.0	- 10225.0	ALL MODES	
10225.0	- 10230.0	NBFM REPEATER LINK IN- PUTS 150 MHz offset	
10230.0	- 10240.0	WIDEBAND DATA - duplex 150 MHz offset	
10240.0	- 10360.0	WIDEBAND MODES	
10240.0	- 10270.0	Channel 3a	10255 ± 15 MHz
10270.0	- 10300.0	Channel 4a	10285 ± 15 MHz
10300.0	- 10330.0	Channel 1b	10315 ± 15 MHz
10330.0	- 10360.0	Channel 2b	10345 ± 15 MHz
10360.0	- 10368.0	ALL MODES	
10368.0	- 10370.0	NARROW BAND MODES	
10368.0	± 100 kHz	EME only	
10368.1	- 10368.4	Terrestrial	
10368.1		Calling frequency: all mode primary/ DX	
10368.2		Calling frequency: all mode secondary/ local	
10368.5	± 100 kHz	Beacons	
10368.6	- 10370.0	General use, all narrow band modes	
10370.0	- 10372.0	NBFM SIMPLEX - voice	
10372.0	- 10375.0	NBFM SIMPLEX - digital	
10375.0	- 10380.0	NBFM REPEATER LINK OUTPUTS 150 MHz offset	
10380.0	- 10390.0	WIDEBAND DATA - duplex 150 MHz offset	
10390.0	- 10450.0	WIDEBAND MODES	
10390.0	- 10420.0	Channel 3b	10405 ± 15 MHz
10420.0	- 10450.0	Channel 4b	10435 ± 15 MHz
10450.0	- 10500.0	AMATEUR SATELLITES	



Australian Beacons

Please advise any additions or corrections to the Chairman, WIA Federal Technical Advisory Committee, PO Box 300, Caulfield South, Vic 3162.

Freq	Call	Service Area	Loc	ST	N
HF Bands					
3.699	VK2RCW	Sydney	QF56	O	(1)
28.260	VK5WI	Adelaide	PF95	O	
28.262	VK2RSY	Sydney	QF56	O	
28.264	VK6RWA	Perth	OF78	O	
28.265	VK4RIK	Cairns	QH23	O	
28.266	VK6RTW	Albany	OF84	O	
28.268	VK8VF	Darwin	PH57	O	
28.270	VK4RTL	Townsville	QH30	O	
6 Metre Band					
50.043	VK8RAS	Alice Springs	PG66	?	(3)
50.056	VK8VF	Darwin	PH57	O	
50.066	VK6RPR	Perth	OF78	O	
52.200	VK8VF	Darwin	PH57	O	
52.300	VK2RBH	Broken Hill	QF08	P	
52.320	VK6RTT	Wickham	OG89	O	
52.325	VK2RHV	Newcastle	OF57	O	
52.330	VK3RGL	Geelong	QF22	O	
52.345	VK4ABP	Longreach	QG26	O	
52.350	VK6RTU	Kalgoortie	PF09	?	
52.370	VK7RST	Hobart	QE37	O	
52.410	VK1RCC	Canberra	QF44	O	
52.420	VK2RSY	Sydney	QF56	O	
52.425	VK2RGB	Gunnedah	QF59	O	
52.435	VK3RMV	Hamilton	QF12	?	
52.440	VK4RTL	Townsville	QH30	O	
52.445	VK4RIK	Cairns	QH23	O	
52.450	VK5VF	Adelaide	PF95	O	
52.460	VK6RPH	Perth	OF78	O	
52.465	VK6RTW	Albany	OF84	O	
52.470	VK7RNT	Launceston	QE38	O	
52.485	VK8RAS	Alice Springs	PG66	O	(3)
2 Metre Band					
144.022	VK6RBS	Busselton	OF76	O	
144.400	VK4RTT	Toowoomba	QG62	O	
144.410	VK1RCC	Canberra	QF44	O	
144.420	VK2RSY	Sydney	QF56	O	
144.430	VK3RTG	Melbourne	QF22	O	
144.435	VK3RMV	Hamilton	QF12	?	
144.445	VK4RIK	Cairns	QH23	O	
144.445	VK4RTL	Townsville	QH30	O	
144.450	VK5VF	Adelaide	PF95	P	(4)
144.465	VK6RTW	Albany	OF84	O	
144.470	VK7RMC	Launceston	QE38	O	
144.480	VK8VF	Darwin	PH57	O	
144.485	VK8RAS	Alice Springs	PG66	O	
144.530	VK3RGG	Geelong	OF22	?	
144.535	VK3RGI	Gippsland		L	
144.550	VK5RSE	Mt Gambier	QF02	O	
144.600	VK6RTT	Wickham	OG89	?	
144.800	VK5VF	Adelaide	PF95	O	(4)
144.950	VK2RCW	Sydney	QF56	O	(2)
144.950	VK3RCW	Melbourne	QF22	O	(2)
145.000	VK6RPH	Perth	OF78	O	
70 cm and Higher Bands					
432.066	VK6RBS	Busselton	OF76	?	
432.160	VK6RPR	Perth	OF78	O	
432.410	VK1RBC	Canberra	QF44	O	
432.410	VK6RTT	Wickham	OG89	?	
432.420	VK2RSY	Sydney	QF56	O	
432.430	VK3RTG	Melbourne	QF22	L	
432.435	VK3RMV	Hamilton	QF12	?	
432.440	VK4RSD	Brisbane	QG62	O	
432.445	VK4RIK	Cairns	QH23	O	
432.445	VK4RTL	Townsville	QH30	O	
432.450	VK3RAI	Melbourne	QF22	O	
432.465	VK6RTW	Albany	OF84	?	
432.530	VK3RGL	Geelong	QF22	T	
432.535	VK3RMB	Ballarat	QF12	O	
432.545	VK4RAR	Rockhampton		QG56	O
432.565	VK6RTU	Kalgoorlie	PF09	?	
1296.198	VK6RBS	Busselton	OF76	O	
1296.410	VK1RBC	Canberra	QF44	O	
1296.420	VK2RSY	Sydney	QF56	O	
1296.440	VK4RSD	Brisbane	QG62	O	
1296.445	VK4RIK	Cairns	QH23	O	
1296.480	VK6RPR	Perth	OF78	O	
2304.420	VK2RSY	Sydney	QF56	P	
2304.445	VK4RIK	Cairns	QH23	O	
2306.440	VK4RSD	Brisbane	QG62	O	
10300.0	VK6RUF	Perth	OF78	?	
10368.0	VK3RGZ	Melbourne	QF22	T	
10445.0	VK4RIK	Cairns	QH23	O	

Notes: (1) CW practice beacons.
(2) CW practice beacons - FM mode.
(3) To move from 52.485 to 50.043.
(4) To move from 144.800 to 144.450 in late 1990.

ARRL DXCC Countries List

NOTE: *INDICATES CURRENT LIST OF COUNTRIES FOR WHICH QSLs MAY BE FORWARDED BY THE APRIL MEMBERSHIP OUTGOING QSL SERVICE
NOTE: †INDICATES COUNTRIES WITH WHICH US AMATEURS MAY LEGALLY HANDLE THIRD-PARTY MESSAGE TRAFFICE
HOW TO USE THE ARRL OUTGOING QSL SERVICE
1) Presort your DX QSLs alphabetically by callsign prefix (AP, C6, CE, DL, F, G, JA, LU, PY, 5N, 9Y and so on).
2) Enclose the address label from your current copy of *QST*. The label shows that you are a current ARRL member.
3) Enclose payment of $2 per pound of cards — approximately 150 cards weigh one pound. A package of ten (10) cards or less costs only $1. Please pay by cheque (or money order) and write your callsign on the cheque. Send "green stamps" (cash) at your own risk.
4) Include only the cards, address label and cheque in the package. Wrap the package securely and address it to the ARRL Outgoing QSL Service, 225 Main St, Newington, CT 06111.
5) Further details are available from the Outgoing QSL Bureau at ARRL HQ.

Prefix	Country
A2*	Botswana
A3*	Tonga
A4*	Oman
A5	Bhutan
A6	United Arab Emirates
A7	Qatar
A9*	Bahrain
AP-AS*	Pakistan
BV	Taiwan
BY, BT*	China
C2*	Nauru
C3*	Andorra
C5†	The Gambiaa
C6*	BahamasC8-9
C8-9	Mozambique
CA-CE†	Chile
CE9/KC4+*	Antarctica
CE0†*	Easter I
CE0†*	San Felix
CE0†*	Juan Fernandez
CM, CO†*	Cuba
CN*	Morocco
CP†*	Bolivia
CT*	Portugal
CT3*	Madeira Is
CU*	Azores
CV-CX†*	Uruguay
CY9*	St Paul I
CY0*	Sable I
D2-3*	Angola
D4*	Cape Verde
D6[2,6]	Comoros
DA-DL[2]*	Fed Rep of Germany
DU-DZ*	Philippines
EA-EH*	Spain
EA6-EH6*	Balearic Is
EA8-EH8*	Canary Is
EA9-EH9*	Ceuta and Melilla
EI-3J*	Ireland
EL†*	Liberia
EP-EQ*	Iran
ET	Ethiopia
F*	France
FT8W*	Crozet
FT8X*	Kerguelen Is
FT8Z*	Amsterdam & St Paul Is
FG*	Guadeloupe
FJ, FS†*	Saint Martin
FH[2,6]*	Mayotte
FK*	New Caledonia
FM*	Martinique
FO*	Clipperton I
FO*	Fr Polynesia
FP*	St Pierre & Miquelon
FR/G4*	Glorioso Is
FR/J,E4*	Juan de Nova, Europa
FR*	Reunion
FR/T*	Tromelin
FW*	Wallis & Futuna Is
FY*	Fr Guiana
G*#	England
GD*	Isle of Man
GI*	Northern Ireland
GJ*	Jersey
GM*	Scotland
GU*	Guernsey & Dep
GW*	Wales
H4*	Solomon Islands
HA, HG*	Hungary
HB*	Switzerland
HB0*	Liechtenstein
HC-HD†*	Ecuador
HC8-HD8†*	Galapagos Is
HH†*	Haiti
HI†*	Dominican Republic
HJ-HK†*	Colombia
HKK0†*	Malpelo I
HK0†*	San Andreas & Providencia
HL*	Korea
HO-HP†*	Panama
HQ-HR†*	Honduras
HS*	Thailand
HV*	Vatican
HZ	Saudi Arabia
I*	Italy
IS0, IM0*	Sardinia
J2*	Djibouti
JD†*	Grenada
J5	Guinea-Bissau
J6†*	St Lucia
J7†*	Dominica
J8†*	St Vincent & Dep
JA-JS*	Japan
JD1[5]	Minami Torishima
JD1[5]	Ogasawara
JT-JV*	Mongolia
JW*	Svalbard
JX*	Jan Mayen
JY†*	Jordan
K, W, N, AA-AK	United States of America
KC6[2,9](W	Caroline Is)Belau
KG4†*	Guantanamo Bay
KH1†	Baker, Howland Is
KH2†*	Guam
KH3†	Johnston I
KH4†*	Midway Is
KH5†	Palmyra, Jarvis Is
KH5K†	Kingman Reef
KH6†*	Hawaiian Is
KH7†	Kure
KH8†*	American Samoa
KH9†	Wake Is
KH0†*	Mariana Is
KL7†*	Alaska
KP1†	Navassa I
KP2†*	Virgin Is
KP4†*	Puerto Rico
KP5[2,7]†	Desecheo Is
LA-LN*	Norway
LO-LW†*	Argentina
LX*	Luxembourg
LZ*	Bulgaria
OA-OC†*	Peru
OD*	Lebanon
OE*	Austria
OF-OI*	Finland
OH0*	Aland Is
OJ0*	Market Reef
OK-OM*	Czechoslovakia
ON-OT*	Belgium
OX*	Greenland
OY*	Faroe Is
OZ*	Denmark
P2[7]*	Papua New Guinea
P4[*3]*	Aruba
PA-PI*	Netherlands
PJ2, 4, 9*	Bonaire, Curacao (Neth,Antilles)
PJ5-8*	St Maarten,Saba, St Eustatius
PP-PY†*	Brazil
PP0-PY0†*	Fernando de Noronha
PP0-PY0†*	St Peter & St Paul Rocks
PP0-PY0†*	Trindade & Martin Vaz Is
PZ*	Suriname
S2*	Bangladesh
S7*	Seychelles
S9	Sao Tome & Principe
SO[1,32]*	Western Sahara
SA-SM*	Sweden
SN-SR*	Poland

ST*	Sudan
ST0*	Southern Sudan
SU*	Egypt
SV-SZ*	Greece
SV5*	Dodecanese
SV9*	Crete
SV/A*	Mount Athos
T2[16]*	Tuvalu
T30	Kiribati (Gilbert & Ocn Is)
T31	C Kiribati (Brit Phoenix Is)
T32	Eastern Kiribati (Line Is)
T33	Banaba I
T5	Somalial
T7*	San Marino
TA-TC*	Turkey
TF*	Iceland
TG, TD†*	Guatemala
TI, TE†*	Costa Rica
TI9†*	Cocos I
TJ	Cameroon
TK*	Corsica
TL[9]	Central African Rep
TN[9]	Congo
TR[10]*	Gabon
TT[11]	Chad
TU[12]*	Ivory Coast
TY[13]	Benin
TZ[14]	Mali
UA1,3,4,6*	European Russian RSFSR
UA1*	Franz Josef Land
UA2*	Kaliningrad
UA9, 0*	Asiatic RSFSR
UB, UT, UY*	Ukraine
UC*	Byelorussia
UD*	Azerbaijan
UF*	Georgia
UG*	Armenia
UH*	Turkmenistan
UI*	Uzbekistan
UJ*	Tadzhikistan
UL*	Kazakhstan
UM*	Kirghizia
UO*	Moldavia
UP*	Lithuania
UQ*	Latvia
UR*	Estonia
VW†*	Antigua & Barbuda
V3*	Belize
V4[15]*	St Christopher & Nevis
V5	(Namibia) SW Africa
V6[29]	(E Caroline Is) Micronesia
V7*	Marshall Islands
V8*	Brunei
VE, VO, VY†*	Canada
VK†*	Australia
VK†*	Lord Howe I
VK9†*	Willis I
VK9†*	Christmas I
VK9†*	Cocos-Keeling Is
VK9†*	Mellish Reef
VK9†*	Norfolk I
VK0†*	Heard I
VK0†*	Macquarie I
VP2E[15]	Anguilla
VP2M[15]*	Montserrat
VP2V[15]*	Br Virgin Is
VP5*	Turks & Caicos Is
VP8*	Falkland Is
VP8, LU*	South Georgia Is
VP8, LU*8, LU*	South Orkney Is
VP	South Sandwich Is
VP8,CE9,HF0,LU,4K1*	South Shetland Is
VP9*	Bermuda
VQ9*	Chagos
VR6†	Pitcairn I
VS6*	Hong Kong
VU*	India
VU*	Andaman & Nicobar Is
VU*	Laccadive Is
XA-XI†*	Mexico
XA4-XI4†*	Revilla Gigedo
XT[17]	Burkina Faso
XU	Kampuchea
XW	Laos
XX9	Macao
XY-XZ	Myanmar
Y2-9[35]*	German Dem Rep
YA	Afghanistan
YB-YH[21]*	Indonesia
YI*	Iraq
YJ*	Vanuatu
YK*	Syria
YN†*	Nicaragua
YI-YYR*	Romania
YS†*	El Salvador
YT-YU, YZ*	Yugoslavia
YV-YY†*	Venezuela
YV0†*	Aves I
Z2*	Zimbabwe
ZA	Albania
ZB2*	Gibraltar
ZC4[30]*	UK Sov Base Areas on Cyprus
ZD7	St Helena
ZD8*	Ascension I
ZD9	Tristan da Cunha & gough I
ZF*	Cayman Is
ZK1*	South Cook Is
ZK1*	North Cook Is
ZK2	Niue
ZK3	Tokelau Is
ZL-ZM*	New Zealand
ZL7*	Chatham Is
ZL8*	Kermadec Is
ZL9*	Auckland I & Campbell I
ZP†*	Paraguay
ZR-SU*	South Africa
ZR2-ZU8*	Prince Edward & Marion Is
ZS9[33]*	Walvis Bay
1A0[1]	Sov Mil Order of Malta
1S[1]	Spratly Is
3A*	Monaco
3B6, 7*	Agalega & St Brandon
3B8*	Mauritius
3B9*	Rodriguez I
3C	Equatorial Guinea
3C0*	Pagalu I
3D2*	Fiji
3D2*	Conway Reef
3D2*	Rotuma I
3DA†*	Swaziland
3V	Tunisia
3W, XV	Vietnam
3X	Guinea
3Y*	Bouvet
3Y*	Peter I
4J1*	Malyj Vysotskij I
4P-4S*	Sri Lanka
4U†*	ITU Geneva
4U*	HQ, United Nations
4W	Yemen
4X, 4Z†*	Israel
5A	Libya
5B*	Cyprus
5H-5I	Tanzania
5N-5O*	Nigeria
5R-5S	Madagascar
5T[18]*	Mauritania
5U[19]	Niger
5V*	Togo
5W*	Western Samoa
5X	Uganda
5Y-5Z*	Kenya
6V-6W[20]*	Senegal
6Y†*	Jamaica
7O	People's Dem Rep of Yemen
7P*	Lesotho
7Q	Malawi
7T-7Y*	Algeria
8P*	Barbados
8Q*	Maldive Is
8R†*	Guyana
9G[22]1	Ghana
9H*	Malta
9I-9J*	Zambia
9K*	Kuwait
9L†*	Sierra Leone
9M2, 4[28]*	Malaysia
9M6, 8[23]*	Eastern Malaysia
9N	Nepal
9Q-0T*	Zaire
9U[24]	Burundi
9V[28]*	Singapore
9X[24]*	Rwanda
9Y-9Z†*	Trinidad & Tobago

Abu Ail, Jabal at Tair

Notes:

[1]Unofficial prefix.

[2](DA-DL) Only contacts made 17 September 1973, and after, count for this country

[3](Y-29) Only contacts made 17 September 1973, and after, count for this country.

[4](FR) Only contacts made 25 June 1960, and after, count tor this country.

[5](JD, KA1) Formerly Marcus Island.

[6](JD, KA1) Formerly Bonin and Volcano Islands.

[7](P2) Only contacts made 16 September 1975, and after, count for this country.

[8](TL) Only contacts made 13 August, 1960, and after, count for this country.

[9](TN) Only contacts made 15 August 1960, and after, count for this country.

[10](TR) Only contacts made 17 August 1960, and after, count for this country.

[11](TT) Only contacts made 11 August 1960, and after, count for this country.

[12](TY) Only contacts made 7 August 1960, and after, count for this country.

[13](TY) Only contacts made 1 August 1960, 1960 and after, count for this country.

[14](TZ) Only contacts made 20 June 1960, and after, count for this country.

[15](VP2) For DXCC credit for contacts made 31 May 1958, and before, see page 97, June 1958 *QST*.

[16](T2, VR8) Only contacts made 1 January1967, and after, count for this country.

[17](XT) Only contacts made 5 August 1960, and after, count for this country.

[18](5T) Only contacts made 20 June 1960, and after, count for this country.

[19](5U) Only contacts made 3 August1960, and after, count for this country.

[20](6W) Only contacts made 20 June 1960, and after, count for this country.

[21](8F, YB) Only contacts made 1 May 1963, and after, count for this country.

[22 19](F) Only contacts made 5 March 1957, and after, count for this country.

[23](9M2, 4, 6, 8) Only contacts made 16 September 1963, and after, count for this country.

[24](9U, 9X) Only contacts made 1 July 1962, and after, count for this country.

[25](9V) Contacts made from 16 September 1963 to 8 August 1965 count for West Malaysia.

[26](D6, FH8) Only contacts made 5 July 1975, and after, count for this country.

[27](KP5, KP4) Only contacts made 1 March 1979, and after, count for this country.

[28](V6, KC6) Includes Yap Is, 1 January 1981, and after.

[29](KC6) Includes Yap Is 31 December 1980, and before.

[30](ZC4) Only contacts made 16 August 1960, and after, count for this country.

[31](P4) Only contacts made 1 January 1986, and after, count for this country.

[32](S0) Contacts with Rio de Oro (Spanish Sahara), EA9, also count for this country.

[33](ZS9) Only contacts made 1 September 1977, and after, count for this country.

+Also AT0, DP0, FT8Y, LU, OR4, VK0, VP8, Y8, ZL5, ZS1, ZX0, E8, 4K1, 8J1, etc. QSL via country under whose auspices the particular station is operating. The availability of a third-party traffic agreement and a QSL Bureau applies to the country under whose auspices the particular station is operating.

DELETED COUNTRIES

Deleted Countries Total: 51

Credit for any of these countries can be give if the date of contact with the country in question agrees with the date(s) shown in the corresponding footnote.

Prefix	Country
AC3[1,2]	Sikkim
AC4[1,3]	Tibet
C9[4]	Manchuria
CN2[5]	Tangier
CR8[6]	Damao, Diu
CR8[6]	Goa
CR8, CR10[7]	Portuguese Timor
DA-DM[8]	Germany
EA9[9]	Ifni
ET2[10]	Eritrea
FF[11]	Fr West Africa
FH, FB8[12]	Comoros
FI8[13]	Fr Indo-China
FN8[14]	French India
FQ8[15]	Fr Equatorial Africa
HK0[16]	Bajo Nuevo
HK0, K0E, KS4[18]	Serrana Bank & Roncador Cay
I1[17]	Trieste
I5[18]	Italian Somaliland
JD1/7J1[19]	Okino Tori-Shima
JZ0[20]	Netherlands N Guinea
KR6,8,J46,KA6[21]	Okinawa (Ryukyu Islands)
KS4[22]	Swan Islands
KZ5[25]	Canal Zone
P2,VK9[24]	Papua Territory
P2,VK9[24]	Terr New Guinea
PK1-3[25]	Java
PK4[25]	Sumatra
PK5[25]	Netherlands Borneo
PK6[25]	Celebe & Molucca Is
UN1[29]	Karelo-Finnish Rep
VO[27]	Newfoundland, Labrador
VQ1,5H1[25]	Zanzibar
VQ6[25]	British Somaliland
VQ9[30]	Aldabra
VQ9[30]	Desroches
VQ9[30]	Farquhar
VS2, 9M2[31]	Malaya
VS4[31]	Sarawak
VS9H[32]	Kuria Muria I
ZC5[31]	British North Borneo
ZC6,4X1[33]	Palestine
ZD4[34]	Gold Coast, Togoland
1M[1,35]	Minerva Reef
7O-VS9K[36]	Kamaran Is
8Z4[37]	Saudi Arabia/Iraq Neutral Zone
8Z5, 9K3[38]	Kuwait/Saudi Arabia Neutral Zone
9S4[39]	Saar
9U5[40]	Ruanda-Urundi
[41]	Blenheim Reef
[42]	Geyser Reef

Notes

[1]Unofficial prefix.

[2](AC3) Only contacts made 30 April 1975, and after, count for this country. Contact made 1 May 1975, and after, count as India.

[3](AC4) Only contacts made 30 May 1974, and after, count for this country. Contacts made 31 May 1974, and after, count as China (BY).

[4](C9) Only contacts made 15 September 1963, and after, count for this country. Contacts made 16 September 1963, and after, count as China (BY)

[5](CN2) Only contacts made 30 June 1960, and after, count for this country. Contacts made 1 July 1960, and after, count as Morocco (CN).

[6](CR8) Only contacts made 31 December 1961, and before, count for this country.

[7](CR8,CR10) Only contacts made 14 September 1976, and before, count for this country.

[8](DA-DM) Only contacts made 16 September 1973, and before, count for this country. Contacts made 17 September 1973, and after, count as either FRG (DA-DL) or GDR (Y2-Y9).

[9](EA9) Only contacts made 13 May 1969, and before, count for this country.

[10](ET2) Only contacts made 14 November 1962, and before, count for this country. Contacts made 15 November 1962, and after, count as Ethiopia (ET).

[11](FF) Only contacts made 6 August 1960, and before, count for this country.

[12](FH, FB8) Only contacts made 5 July 1975, and before, count for this country. Contacts made 6 July 1975, and after, count as Comoros (D6) or Mayotte (FH).

[13](FI8) Only contacts made 20 December 1950, and before, count for this country.

[14](FN8) Only contacts made 31 October 1954, and before, count for this country.

[15](FQ8) Only contacts made 16 August 1960, and before, count for this country.

[16](HK0, KP3, KS4) Only contacts made 16 September 1981, and before, count for this country. Contacts made 17 September 1981, and after, count as San Andres (HK0).

[17](I1) Only contacts made 31 March 1957, and before, count for this country. Contacts made 1 april 1957, and after, count as Italy (I).

[18](I5) Only contacts made 30 June 1960, and before, count for this country.

[19](JD1/7J1) Only contacts made 30 May 1976, and before, count for this country. Contacts made 1 December 1980, and after, count as Ogasawara (JD1).

[20](JZ0) Only contacts made 30 April 1963, and before, count for this country.

[21](KR6,8, JR6, KA6) Only contacts made 14 May 1972, and before, count for this country. Contacts made 15 May 1972, and after, count as Japan (JA).

[22](KS4) Only contacts made 31 August 1972, and before, count for this country. Contacts made 1 September 1972, and after, count as Honduras (HR).

[23](KZ5) Only contacts made 30 September 1979, and before, count for this country.

[24](P2, VK9) Only contacts made 15 September 1975, and before, count for this country. Contacts made 16 September 1975, and after, count as Papua New Guinea (P2).

[25](PK1-6) Only contacts made 30 April 1963, and before, count for this country. Contacts made 1 May 1963, and after, count as Indonesia (YB).

[29](UN1) Only contacts made 30 June 1960, and before, count for this country. Contacts made 1 July 1960, and after, count as European RSFSR (UA).

[27](VO) Only contacts made 31 March 1949, and before, count for this country. Contacts made 1 April 1949, and after, count as Canada (VE)

[28](VQ1, 5H1) Only contacts made 31 May 1974, and before, count for this country. Contact made 1 June 1974, and after, count as Tanzania (5H).

[29](VQ6) Only contacts made 40 June 1960, and before, count for this country.

[30](VQ9) Only contacts made 28 June 1976, and before, count for this country. Contacts made 29 June 1976, and after, count as Seych-

elles (S7).
[31](VS2, VS4, ZC5, 9M2) Only contacts made 15 September 1963, and before, count for this country. Contacts made 16 September 1963, and after, count as West Malaysia (9M2) or East Malaysia (9M6,8).
[32](VS9H) Only contacts made 29 November 1967, and before, count for this country.
[33](ZC6, 4X1) Only contacts made 30 June 1968, and before, count for this country.
[34](ZD4) Only contacts made 5 March 1957, and before, count for this country.
[35](1M) Only contacts made 15 July 1972, and before, count for this countiy. Contacts made 16 July 1972, and after, count as Tonga (A3).
[36](7O/VS9K) Only contacts made 10 March 1982, and before, count for this country.
[37](8Z4) Only contacts made 25 December 1982, and before, count for this country.
[38](8Z5, 9K3) Only contacts made 14 December 1969, and before, count for this country.
[39](9S4) Only contacts made 31 March 1957, and before, count for this country.
[40](9U5) Only contacts made 1 July 1960, and before, count for this country. Contacts made 1 July 1962, and after, count as Burundi (9U) or Rwanda (9X).
[41](Blenheim Reef) Only contacts made 4 May 1967 to 30 June 1975, count for this country. Contacts made 1 July 1975, and after, count as Chagos (VQ9).
[42](Geyser Reef) Only contacts made 4 May 1967 to 28 February 1978, count for this country.

PREFIX CROSS REFERENCES
A8 = EL
AC (before 1972) = A5
AH = KH
AL7 = KL7
AM-AO = EA
AT-AW = VU
AX = VK
AY-AZ = LU
CF=CK = VE
CL = CO
CQ=CS = CT
CR3 (before 1974) = J5
CR4 (before 1976) = D4
CR5 (before 1976) = S9
CR6 (before 1976) = D2
CR7 (before 1976) = C9
CR9 (before 1985) = XX9
CT2 (before 1986) = CU
CX0 - CE9/VP8
CY-CZ = VE
CY0 (before 1985) = CY9
DM-DT (before 1980) = Y2-9
EA0 (before 1969) = 3C
ES = UR
EK, EM-EO, ER-ES, EU-EZ = U
FA-FF (before 1983) = F
FA (before 1963) = 7X
FB8 (before 1961) = 5R
FB8 (before 1985) = FT
FC (before 1985) = TK
FD8 (before 1961) = 5V
FE8 (before 1961) = TJ
FL (before 1978) = J2
FU8 (before 1982) = YJ
GB = G
GC (before 1977) = FJ/GU
H2 = 5B
H3 = HP
H5 (BOPHUTATSWANA) = ZS
H7 + YN
HE + HB
HM (before 1982) = HL
HT = YN
HU = YS
HW-HY = F
J4 = SV
KA1 = JDKA2AA=KA8ZZ = JA
KC6 (before 1990) = V6
KB6 (before 1979) = KH1
KC4 (NAVASSA) = KP1
KG6 (before 1979) = KH2
KG61 (before 1970) = JD1
KG6R, S, T (before 1979) = KH0
KJ6 (before 1979) = KH3
KM6 (before 1979) = KH4
KP4 (Desecheo) = KP5
KP6 (before 1979) = KH5
KS6 (before 1979) = KH8
KV4 (before 1979) = KP2
KW6 (before 1979) = KH9
KX6 (before 1990) = V7
L2-9 = LU
LY = UP
M1 (before 1984) = T7
MP4B (before 1972) = A9
MP4M (before 1972) = A4
MP4Q (before 1972) = A7
MP4T, D (before 1972) = A6
NH = KH
NL7 = KL7
NP = KP
OQ (before 1961) = 9Q
P4 (before 1986) = PJ
PX (before 1970) = C3
RA, RN = UA
RB-RR = UB-UR
RS = U
RT = UB
RU-RZ = U
S4 (Ciskei) = ZS
S8 (Transkei) = ZS
T4 = CO
T4 (Venda) = ZS
TH, TM, TO-TQ, TV-TX = F
UN, UV, UW, UZ = UA
V9 (Venda) = ZS
VA-VG = VE
VH-VN = VK
VK9 (Nauru) = C2
VP1 (before 1982) = V2
VPWA (before 1982) = V2
VP2D (before 1979) = J7
VP2G (before 1975) = J3
VP2K (before 1984) = V4 or VP2E
VP2L (before 1980) = J6
VP2S (before 1980) = J8
VP3 (before 1967) = 84
VP4 (before 1963) = 9Y
VP5 (Jamaica) = 6Y
VP6 (before 1967) = 8P
VP7 (before 1974) = C6
VQ2 (before 1965) = 9J
VQ3 (before 1962) = 5H
VQ4 (before 1964) = 5Z
VQ5 (before 1963) = 5X
VQ6 (before 1969) = 3B
VQ8 (Chagos) = VQ9
VQ9 (Seychelles) = S7
VR1 (before 1980) = T3
VR2 (before 1971) = 3D2
VR3 (before 1980) = T32
VR4 (before 1979) = H4
VR5 (before 1971) = A3
VR8 (before 1979) = T2
VS1 (before 1966) = 9V
VS5 (before 1985) = V8
VS7 (before 1949) = 4S
VS9A, P, S (before 1968) = 70
VS9M = 8Q
VS9O (before 1961) = A4
VX=VY = CY0/VE
WH = KH
WL7 = KL7
WP = KP
XJ-XO = VE
XP = OX
XQ-XR = CE
XV = 3W
XX7 (before 1976) = C9
YL = UO
ZB1 (before 1965) = 9H
ZD1 (before 1962) = 9L
ZD2 (before 1961) = 5N
ZD3 (before 1966) = C5
ZD4 (before 1958) = 9G
ZD5 (before 1969) = 3DA
ZD6 (before 1965) = 7Q
ZE (before 1981) = Z2-9
ZK9 (1983) = ZK2
ZM6 (before 1963) = 5W
ZM7 (before 1984) = ZK3
ZS7 (before 1969) = 3D6
ZS8 (before 1967) = 7P
ZS9 (before 1967) = A2
ZC-ZZ = PY
3B-3C (before 1968) = VE
3D6 (before 1988) = 3DA
3G = CE
3Z = SP
4A-4C = XE
4D-4I = DU
4J-4L = U
4M = YV
4N-4O = YU
5T = OA
4U1VIC = OE
4V = HH
5J-5K = HK
5L-5M = EL
6C = YK
6D-6J = XE
6O = T5
6T-6U = ST
7A-7I = YB
7G (before 1967) = 3X
7J-7N = JA, JD
7S = SM
7Z = HZ
8A=8I = YB
8J-8N = JA
8O = A2
8S = SM
9A (before 1984) = T7
9B-9D = EP
9E-9F = ET
CONTINENT
AF = AFRICA
AN = ANTARCTICA
AS = ASIA
EU = EUROPE
NA = NORTH AMERICA
OC = OCEANIA
SA = SOUTH AMERICA

ZONE NOTES
(A) 33, 42, 43, 44
(B) 67, 69-74
(C) 12, 13, 29, 30, 32, 38, 39
(D) 12, 13, 15
(E) 19, 20, 29, 30
(F) 20-26, 30-35, 75
(G) 16, 17, 18, 19, 23
(H) 2, 3, 4, 9, 75
(I) 55, 58, 59

Allocation of International Callsigns

Callsign Series	Allocated to
AAA-ALZ	United States of America
AMA-AOZ	Spain
APA-ASZ	Pakistan
ATA-AWZ	India
AXA-AXZ	Australia
AYA-AZZ	Argentina
A2A-A2Z	Botswana
A3A-A3Z	Tonga
A4A-A4Z	Oman
A5A-A5Z	Bhutan
A6A-A6Z	United Arab Emirates
A7A-A7Z	Qatar
A8A-A8Z	Liberia
A9A-A9Z	Bahrain
BAA-BZZ	China
CAA-CEZ	Chile
CFA-CKZ	Canada
CLA-CMZ	Cuba
CNA-CNZ	Morocco
COA-COZ	Cuba
CPA-CPZ	Bolivia
CQA-CUZ	Portugal
CVA-CXZ	Uruguay
CYA-CZZ	Canada
C2A-C2Z	Nauru
C3A-C3Z	Andorra
C4A-C4Z	Cyprus
C5A-C5Z	Gambia
C6A-C6Z	Bahamas
C7A-C7Z*	World Meteorological Organisation
C8A-C9Z	Mozambique
DAA-DRZ	Federal Republic of Germany
DSA-DTZ	Republic of Korea
DUA-DZZ	Philippines
D2A-D3X	Angola
D4A-D4Z	Cape Verde
D5A-D5Z	Liberia
D6A-D6Z	Comoros
D7A-D9Z	Republic of Korea
EAA-EHZ	Spain
EIA-EJZ	Ireland
EKA-EKZ	Union of Soviet Socialist Republics
ELA-ELZ	Liberia
EMA-EOZ	Union of Soviet Socialist Republics
EPA-EQZ	Iran
ERA-ESZ	Union of Soviet Socialist Republics
ETA-ETZ	Ethiopia
EUA-EWZ	Byelorussian Soviet Socialist Republic
EXA-EZZ	Union of Soviet Socialist Republics
FAA-FZZ	France
GAA-GZZ	United Kingdom of Great Britain and Northern Ireland
HAA-HAZ	Hungary
HBA-HBZ	Switzerland
HCA-HDZ	Ecuador
HEA-HEZ	Switzerland
HFA-HFZ	Poland
HGA-HGZ	Hungary
HHA-HHZ	Haiti
HIA-HIZ	Dominican Republic
HJA-HKZ	Colombia
HLA-HLZ	Republic of Korea
HMA-HMZ	Democratic People's Republic of Korea
HNA-HNZ	Iraq
HOA-HPZ	Panama
HQA-HRZ	Honduras
HSA-HSZ	Thailand
HTA-HTZ	Nicaragua
HUA-HUZ	El Salvador
HVA-HVZ	Vatican City
HWA-HYZ	France
HZA-HZZ	Saudi Arabia
H2A-H2Z	Cyprus
H3A-H3Z	Panama
H4A-H4Z	Solomon Islands
H6A-H7Z	Nicaragua
H8A-H9Z	Panama
IAA-IZZ	Italy
JAA-JSZ	Japan
JTA-JVZ	Mongolian People's Republic
JWA-JXZ	Norway
JYA-JYZ	Jordan
JZA-JZZ	Indonesia
J2A-J2Z	Djibouti
J3A-J3Z	Grenada
J4A-J4Z	Greece
J5A-J5Z	Guinea-Bissau
J6A-J6Z	Saint Lucia
J7A-J7Z	Dominica
J8A-J8Z	St Vincent and the Grenadines
KAA-KZ	United States of America
LAA-LNZ	Norway
LOA-LWZ	Argentina
LXA-LXZ	Luxembourg
LYA-LYZ	Union of Soviet Socialist Republics
LZA-LZZ	Bulgaria
L2A-L9Z	Argentina
MAA-MZZ	United Kingdom of Great Britain and Northern Ireland
NAA-NZZ	United States of America
OAA-OCZ	Peru
ODA-ODZ	Lebanon
OEA-OEZ	Austria
OFA-OJZ	Finland
OKA-OMZ	Czechoslovakia
ONA-OTZ	Belgium
OUA-OZZ	Denmark
PAA-PIZ	Netherlands
PJA-PJZ	Netherlands Antilles
PKA-POZ	Indonesia
PPA-PYZ	Brazil
PZA-PZZ	Suriname
P2A-P2Z	Papua New guinea
P3A-P3Z	Cyprus
P4A-P4Z	Aruba
P5A-P9Z	Democratic People's Republic of Korea
OAA-QZZ	(Service abbreviations)
RAA-RZZ	Union of Soviet Socialist Republics
SAA-SMZ	Sweden
SNA-SRZ	Poland
SSA-SSM	Egypt
SSN-STZ	Sudan
SUA-SUZ	Egypt
SVA-SZZ	Greece
S2A-S3Z	Bangladesh
S6A-S6Z	Singapore
S7A-S7Z	Seychelles
S9A-S9Z	Sao Tome and Principe
TAA-TCZ	Turkey
TDA-TDZ	Guatemala
TEA-TEZ	Costa Rica
TFA-TFZ	Iceland
TGA-TGZ	Guatemala
THA-THZ	France
TIA-TIZ	Costa Rica*
TJA-TJZ	Cameroon
TKA-TKZ	France
TLA-TLZ	Central African Republic
TMA-TMZ	France
TNA-TNZ	Congo
TOA-TQZ	France
TRA-TRZ	Gabon
TSA-TSZ	Tunisia
TTA-TTZ	Chad
TUA-TUZ	Ivory Coast
TVA-TXZ	France
TYA-TYZ	Benin
TZA-TZZ	Mali
T2A-T2Z	Tuvalu
T3A-53Z	Kiribati
T4A-T4Z	Cuba
T5A-T5Z	Somalia
T6A-T6Z	Afghanistan
T7A-T7Z	San Marino
UAA-UQZ	Union of Soviet Socialist Republics
URA-UTZ	Ukrainian Soviet Socialist Republic
UUA-UZZ	Union of Soviet Socialist Republics
VAA-VGZ	Canada
VHA-VNZ	Australia
VOA-VOZ	Canada
VPA-VSZ	United Kingdom of Great Britain and Northern Ireland
VTA-VWZ	India

VXA-VYZ	Canada
VZA-VZZ	Australia
V2A-V2Z	Antigua and Barbuda
V3A-V3Z	Belize
V4A-V4Z	St Christopher and Nevis
V6A-V6Z	Micronesia
V7A-V7Z	Marshall Islands
V8A-V6Z	Brunei
WAA-WZZ	United States of America
XAA-XIZ	Mexico
XJA-XOZ	Canada
XPA-PXZ	Denmark
XQA-XRZ	Chile
XSA-XSZ	China
XTA-XTZ	Burkina Faso
XUA-XUZ	Kampuchea
XVA-XVZ	Vietnam
XWA-XWZ	Laos
XXA-XXZ	Portugal
XYA-XZZ	Burma
YAA-YAZ	Afghanistan
YBA-YHZ	Indonesia
YIA-YIZ	Iraq
YJA-YJZ	New Hebrides
YKA-YKZ	Syria
YLA-YLZ	Union of Soviet Socialist Republics
YMA-YMZ	Turkey
YNA-YNZ	Nicaragua
YOA-YRZ	Romania
YSA-YSZ	El Salvador
YTA-YUZ	Yugoslavia
YVA-YYZ	Venezuela
YZA-YZZ	Yugoslavia
Y2A-Y9Z	German Democratic Republic
ZAA-ZAZ	Albania
ZBA-ZJZ	United Kingdom of Great Britain and Northern Ireland
ZKA-ZMZ	New Zealand
ZNA-ZOZ	United Kingdom of Great Britain and Northern Ireland
ZPA-ZPZ	Paraguay
ZQA-ZQZ	United Kingdom of Great Britain and Northern Ireland
ZRA-ZUZ	South Africa
ZVA-ZZZ	Brazil
Z2A-Z2Z	Zimbabwe
2AA-2ZZ	United Kingdom of Great Britain and Northern Ireland
3AA-3AZ	Monaco
3BA-3AZ	Mauritius
3CA-3CZ	Equatorial Guinea
3DA-3DM	Swaziland
3DN-3DZ	Fiji
3EA-3FZ	Panama
3GA-3GZ	Chile
3HA-3UZ	China
3VA-3VZ	Tunisia
3WA-3WZ	Vietnam
3XA-3XZ	Guinea
3YA-3YZ	Norway
3ZA-3ZZ	Poland
4AA-4CA	Mexico
4DA-4IZ	Philippines
4JA-4LZ	Union of Soviet Socialist Republics
4MA-4MZ	Venezuela
4NA-4OZ	Yugoslavia
4PA-4SZ	Sri Lanka
4TA-4TZ	Peru
4UA-4UZ*	United Nations Organisation
4VA-4VZ	Haiti
4WA-4WZ	Yemen Arab Republic
4XA-4XZ	Israel
4YA-4YZ*	International Civil Aviation Organisation
4ZA-4ZZ	Israel
5AA-5AZ	Libya
5BA-5BZ	Cyprus
5CA-5GZ	Morocco
5HA-5IZ	Tanzania
5JA-5KZ	Colombia
5LA-5MZ	Liberia
5NA-5OZ	Nigeria
5PA-5OZ	Denmark
5RA-5SZ	Madagascar
5TA-5TZ	Mauritania
5UA-5UZ	Niger
5VA-5VZ	Togo
5WA-5WZ	Western Samoa
5XA-5XZ	Uganda
5YA-5ZZ	Kenya
6AA-6BZ	Egypt
6CA-6CZ	Syria
6DA-6JZ	Mexico
6KA-6NZ	Republic of Korea
6OA-6OZ	Somalia
6PA-6SZ	Pakistan
6TA-6UZ	Sudan
6VA-6WZ	Senegal
6XA-6XZ	Madagascar
6YA-6YZ	Jamaica
6ZA-6ZZ	Liberia
7AA-7IZ	Indonesia
7JA-7NZ	Japan
7OA-7OZ	Yemen
7PA-7PZ	Lesotho
7QA-7QZ	Malawi
7RA-7RZ	Algeria
7SA-7SZ	Sweden
7TA-7YZ	Algeria
7ZA-7ZZ	Saudia Arabia
8AA-8IZ	Indonesia
8JA-8NZ	Japan
8OA-8OZ	Botswana
8PA-8PZ	Barbados
8QA-8QZ	Maldives
8RA-8RZ	Guyana
8SA-8SZ	Sweden
8TA-8YZ	India
8ZA-8ZZ	Saudi Arabia
9BA-9DZ	Iran
9EA-9FZ	Ethiopia
9GA-9GZ	Ghana
9HA-9HZ	Malta
9IA-9JZ	Zambia
9KA-9KZ	Kuwait
9LA-9LZ	Sierra Leone
9MA-9MZ	Malaysia
9NA-9NZ	Nepal
9OA-9TZ	Zaire
9UA-9UZ	Burundi
9VA-9VZ	Singapore
9WA-9WZ	Malaysia
9XA-9XZ	Rwanda
9YA-9ZZ	Trinidad and Tobago

Note

The series of callsigns with an asterisk indicate the international organisation to which they are allocated.

Videotape Library

WIA VIDEOTAPE LIBRARY c/- JOHN INGHAM VK5KG
37 SECOND AVENUE SEFTON PARK SA 5083

Now every radio club can provide its 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'll find this a boon, particularly if yours is a country club which often has difficulty obtaining a variety of expert lecturers for its regular meetings. (Individual Amateurs and Librarians should take note of the duplication fees at the end of this).

For radio clubs affiliated with the WIA it's inexpensive and easy.

Here's how it works . . .

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 in a video cassette box "postpak", and enclose address and stamps for return postage, 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 marked 'c' below, 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".

Enclose address and stamps for postage to you.

The present "available formats" are as follows :

VHS — size 200 x 110 x 30mm, mass 350gr.

* Standard play 4hr max, or long play 8hr max, 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 x 30mm, mass 300gr

Standard play 3 hr 15min max only

Standard sound only (no Dolby)

Video 8 — size 103 x 68 x 20mm, mass 80gr

* Standard play 1-1/2hr max, or long play 3hr max as requested
* Hi-Fi" FM sound is standard (no Dolby).

Obviously, the smaller and lighter the cassette, the less the 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 to 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 a time.

Video duplication is a real-time, one-at-a-time operation for which the cost 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. Indeed, if EVERY member of the WIA requested just ONE program it would take about four years at 40 hours weeks 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 individual amateurs. 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.

Note re tape cassette quality: The WIA Videotape Co-ordinator retains the right to refuse to copy onto inferior quality video tape. In the past, such tape has caused many hours of wasted time through clogged heads and, in future, only reputable brands of video tape will be accepted. In particular, although not always in itself a guarantee of quality use only those VHS cassettes which carry the official VHS logo.

WIA Videotape Program Title Listing as of 1/1/91

See Note	TITLE (in chronological order within each subject grouping)	Lecturer	Prod	Approx Dur	Col/ B&W	Year Prod	Description and/or Other information
Note	within each subject grouping)			Dur	B&W	Prod	Other Information
	AMATEUR RADIO — HISTORIC INTEREST						
c	Wireless Telegraphy — circa 1910		?	10mins	B&W	1910	Archive material courtesy David Wardlaw VK3ADW
c	Amateur Radio (TV Pilot Program		WIA NSW	30mins	B&W	1968	Archive material courtesy TEN channel 10
—	Opening of Burley Griffen Bldg — SA HO		VK5KG	50mins	Colour	1977	Archive material
—	ATV in A ustralia 1978 — made for British ATV Club		VK5KG	30mins	Colour	1978	Archive material
—	ATV in United Kingdom 1978 — reply from BATC		G8CJS	30mins	Colour	1978	Archive material
—	History of ATV in South Australia		VK5KG	30mins	Colour	1960	Archive malarial, still building
—	Opening of Amateur Radio House — NSW HQ	VK2BDN & VK2ZOC		1'42"	Colour	1964	Archive material
—	VK2 75th Anniv Seminar Keynote Speeches		WIA NSW	2'15"	Colour	1963	Dr David Wardlaw & State Manager DOC
c	Heard Island DXpeditions		ch 2,7,9,10	20mins	Colour	1964	Archive material; NO LOAN OR COPY AVAILABLE
—	Heard Island DXpedition	VK2BCC	WIA NEW	60mins	Colour	1966	Raw unedited; from 1986 VK2 Seminar

See Note	TITLE (in chronological order within each subject grouping)	Lecturer	Prod	Approx Dur	Col/ B&W	Year Prod	Description and/or Other Information
	AMATEUR RADIO — PROMOTIONAL						
d	The Ham's Wide World		ARRL	27mins	Colour	1969	Superseded by "The World of Amateur Radio"
—	This is Amateur Radio		ARRL	15mins	Colour	1970	Pitched at teenagers
—	Moving Up to Amateur Radio		ARRL	11mins	Colour	1975	Pitched at CBers
c	7JIRL DXpedition		JARL	60mins	Colour	1976	General Amateur Radio interest; LOAN ONLY
—	This Week has 7 Days looks into Amateur Radio		HSV7	25mins	Colour	1978	Pitched at teens; includes some ARRL footage
o	The World of Amateur Radio		ARRL	26mins	Colour	1978	Superseded by "The New World of Amateur Radio"
—	Amateur Radio – The National Resource of Every Nation	VK5KG		6mins	Colour	1979	Encapsulates AR; good for public exhibitions
—	The New World of Amateur Radio		ARRL	28mins	Colour	1988	Supersedes "The World of Amateur Radio"
	ANTENNAS						
c	G6CJ's Aerial Circus	G6CJ	WIA	90mins	B&W	1977	THE Definitive Antenna Lecture; LOAN ONLY
—	Wire Antennas	VK5RG	VK5KG	40mins	B&W	1978	Antennas for HF and Antenna Tuners
—	Loaded Wire Antennas	VK5NN	VK5KG	50mins	Colour	1980	Using inductive and capacity loaded antennas
#	Antennas and Directivity	VK2BBF	OTC	73mins	Colour	1985	Lecture given to a group of radio amateurs
—	Antenna Rotator Systems	VK5AIM	VK5KG	50mins	Colour	1986	Servicing the several different types
—	Broadband Antennas	VK5RG	VK5KG	62mins	Colour	1986	Includes terminated antennas
	ATV — ACTIVITY						
d	ATV in Australia 1980/81 — Made for British ATV Club		VK5KG	60mins	Colour	1980	Clips from ATV Groups in VKs 2,3,4,5,&8
o	ATV in United Kingdom 1978/81		G8CJS	30mins	Colour	1981	Remake of its previous effort
o#	CQ ATV DX International 1983		WB2LLB	50mins	Colour	1983	ATV in USA and Europe
o	ATV in Victoria, 1984		VK3AHJ	54mins	Colour	1984	Courtesy of "The Roadshow Gang"
—	Hello from America! — Made for British ATV Club		WB0QCD	100mins	Colour	1988	Clips from ATV Groups in the USA
n	VK5 ATV Call-in July 1990	various	VK5ZBD	90mins	Colour	1990	Recorded off air from VK5RTV
n	Gladesville ARC AUSSAT TX of 14/11/90	various	VK2ZZO	3 hrs	Colour	1991	Recorded off air from VK5RTV via AUSSAT
	ATV — GENERAL INTEREST						
—	Low-Definition Television	Chris Long	VK5KG	25mins	Colour	1982	Re-creation of TV as transmitted by Baird
—	Model Aero-Nautical Mobile ATV	VK5GO	VK5KG	6mins	Colour	1983	ATV camera & TX mounted in a model aeroplane
—	VK5RCN — Aust' first wind-powered ATV rptr	VK5KAU	VK5KG	61mins	Colour	1986	A tour in and around VK5RCN
—	Australian TV History — The Untold Story	Chris Long	VK5KC	56mins	Colour	1988	Lecture to radio amateurs Old Timers Club
—	Australian TV History — Part 2	Chris Long	VK5KG	49mins	Colour	1988	Technical slides not used in the above
—	The Development of the TV Test Card	George Hersee	G8PTH	43mins	Colour	1988	Made for BATC by the BBC Training Dept
	ATV — TECHNICAL						
a	The Signal to Noise Story	VK3ATY	VK3AHJ	45mins	Colour	1982	Superseded by "UHF Preamplifiers" (below)
—	UHF Preamplifiers	VK3ATY	VK3AHJ	45mins	Colour	1983	Explanation and demo of low-noise preamps
—	Getting Started in Amateur Television	VK5KTV	VK5KG	55mins	Colour	1983	How to set up an ATV station
—	Testing ATV Transmitters	VK5KG	VK5KG	50mins	Colour	1983	How to correctly measure ATV systems
o*	High Definition TV Tutorial	Don Fink	WB2LLB	60mins	B&W	1983	A look at what is to come in Broadcast TV
o*	ATV Hamfest, York, Pennsylvania, Sept'83	Various	WB2LLB	6hrs	Colour	1983	Various ATV technical lectures from USA
	COMPUTERS						
—	Demo of VK5RTV's Micro-Computer Controller #1	VK5KG	VK5KG	10mins	Colour	1979	First u-computer controlled repeater in VK
o	Understanding Micro-Processors	VK5PE	VK5KG	60mins	Colour	1980	A somewhat dated technical description
o	An ATV Hamshack Micro-Computer	VK3AHJ	VK3AHJ	10mins	Colour	1981	Describes now unavailable microcomputer kit
—	Getting Started in Amateur Microcomputers	VK5IF	VK5KG	33mins	Colour	1983	Demo of hard & software for amateur radio
	DATA TRANSMISSION						
—	Getting Started in Amateur RTTY	VK5JN	VK5KG	85mins	Colour	1983	RTTY using teleprinters and microcomputers
—	Amateur Packet Radio	VK5AGR	VK5KG	60mins	Colour	1984	Theory and demonstration
—	Packet Radio — 10 Months On	VK2KYJ & VK2AAB	WIA NSW	65mins	Colour	1985	Raw, unedited; from 75 anniv VK2 Seminar
#	X25 Protocols and Packet Switching	VK2ZXB	OTC	47mins	Colour	1986	Lecture given to a group of radio amateurs
	MICROWAVE TECHNIQUES						
—	Introducing Microwaves	Des Cliff VK5ZO	PJ Video	74mins	Colour	1988	"Nuts & Bolts" expert technical lecture
n	(see also Amateur Satellites and Packet Radio)						
	PROPAGATION						
—	Getting Started in Understanding the Ionosphere	VK5NX	VK5ZBD	50mins	Colour	1983	How the ionosphere aids HF communication
—	VHF Signal Enhancement by Aircraft	VK2ZAB	WIA NSW	70mins	Colour	1986	Raw, unedited; from 1986 VK2 Seminar
	SATELLITES						
o	Getting Started in Amateur Satellites	VK5HI & VK5AGR	VK5KG	60mins	Colour	1983	Superseded (see below)
o	An Introduction to Amateur Satellites (Pt 1)	VK5AGR	VK5KG	60mins	Colour	1984	An overview of amateur satellite working
o	Micro-Computer Aids to Satellite Tracking (Pt 2)	VK5AGR	VK5KG	30mins	Colour	1984	Programs for tracking & decoding telemtry
—	Using Phase III Amateur Satellites	VK5HI	VK5KG	90mins	Colour	1984	History, construction & use of high-orbit sals
—	The Amsat Oscar Phase 3 Story Dr Karl Meinzer	DJ4ZC	VK5KG	60mins	Colour	1985	"The Father of Oscar" includes film of launch
—	Antennas for Satellites	Dr Trevor Bird	WIA NSW	75mins	Colour	1986	Raw, unedited; from 1986 VK2 Seminar
n	What Satellites Have to Offer	Gra Rattcliff VK5AGR	GARC	190mins	Colour	1990	Recorded at Hay NSW Satellite Seminar
n	Am Sats and Packet Radio	Gra Rattcliff VK5AGR	GARC	130mins	Colour	1990	Recorded at Hay NSW Satellite Seminar
n	AMSAT Ground Control	Gra Rattcliff VK5AGR	GARC	152mins	Colour	1990	Recorded at Hay NSW Satellite Seminar
	SPACE — GENERAL INTEREST						
—	Apollo 13 Disaster	VK5JM	VK5KG	90mins	Colour	1990	Australian tracking procedure saved Apollo 13
o	SSTV Pictures from Space — Voyager		VK5KG	15mins	Colour	1983	SSTV pix converted from Satura fly past
—	Aussat — Australia's Domestic Comms Satellite	VK5JN	VK5KG	62mins	Colour	1984	Technical description of services offered
—	Amateur Radio's Newest Frontier		ARRL	26mins	Colour	1985	Amateur radio in space; general PR
—	Working W5LFL in orbit from VK1ORR	Richard Elliot		23mins	Colour	1986	Raw, unedited actuality footage
	MISCELLANEOUS						
—	An Auxiliary Battery Charger	VK5NX	VK5KG	30mins	Colour	1981	Charging a second mobile battery
—	Lecture — Winning Foxhunts	VK5TV	VK5KG	45mins	Colour	1981	How to do it from one who has?
—	Getting Started in Amateur Construction	VK5AIM	VK5KG	50mins	Colour	1983	Mechanical hints for novice constructors
—	Comms Consequences of Nuclear War	Dr John Coulter	VK5ZBD	60mins	Colour	1983	Why your gear may not survive even if you dol
—	The Far Eastern Broadcasting Company		VK5KG	60mins	Colour	1983	How a short-wave broadcaster operates
—	The Aust "Over the Horizon Radar"	Dr Phil Witham	VK5KG	60mins	Colour	1984	How the "Australian Woodpecker" works
—	What to Expect when the RI Calls	Geof Carter - DOC	VK5KG	34mins	Colour	1984	Geof is a Dept of Comms Field Officer
—	Doppler Direction Finding for Foxhunters	VK2BYY	WIA NSW	43 mins	Colour	1985	Raw, unedited; from 75 anniv VK2 Seminar
w	Fitting BNC Connectors		OTC	7mins	Colour	1985	Correct assembly of crimp-type BNC plugs
w	Handling Static Sensitive PCBs	Paul Tardent	OTC	6mins	Colour	1986	Improving reliability of printed circuits
—	Extra Licence Grades	VK2ZTB	WIA NSW	70mins	Colour	1986	Raw, unedited; from 1986 VK2 Seminar
—	Thick Film Modules	VK5DI	VK5KG	45mins	Colour	1988	Desc of modules avail from vk5 wia
—	Quartz Crystals	Clem Tilbrook VK5GL	VK5GL	106mins	Colour	1988	"Nuts & Bolts" expert technical lecture
n	How to Survive in a Dog Pile	John Saunders VK2DEJ	GARC	148mins	Colour	1989	Recorded by Gladesville ARC for NSW WIA
n	HF DX Seminar	Iris & Les Colvin	GARC	74mins	Colour	1990	Recorded by Gladesville ARC for NSW WIA
n	Making Friends on DX	Syd Molen VK2SG	GARC	28mins	Colour	1990	Recorded by Gladesville ARC for NSW WIA

NOTE . . "c' = Copyright; no copy service . . "#" = Optically converted to PAL from NTSC by VB2LLB; noticeable flicker. "w" = available ONLY to radio clubs affiliated with the WIA as per agreement with OTC. "o" = program now out of date. "n" = new edition.
Standard formats: "Beta", "Video-8" St & I Play; "VHS" St & L Play, "Dolby" and "Hi-Fi" sound — please specify when ordering.

Australian VHF-UHF Records

Updated 21/12/90

Key: EME National EME records
DIG Digital modes records
ATV National ATV records
MOB National mobile records

National records shown in bold type

Div	From	To	Date	Distance
6-Metre Band		**80-54MHz**		
VK2	VK2ASC	VE1ASJ	06/04/81	16654.4
VK3	VK3OT	F6HWM	19/10/89	16887.8
VK4	VK4AYX	DL3ZM/YV5	18/03/81	15582.0
VK5	VK5KK	XE1GE	09/04/79	14078.0
VK6	VK6BE	JA8BP	30/10/58	8833.0
VK7	VK7IK	W4EQM	27/04/90	15343.0
VK8	**VK8RH**	**5R1AH**	**02/04/89**	**18857.9**
DIG	VK4KHZ	JH1WHS	27/11/88	7234
2-Metre Band		**144-148MHz**		
VK1	VK1VP	VK4ZSH	14/12/83	936.4
VK2	VK2ZRU	VK6AOM	13/12/86	2697.9
VK3	VK3YLR/3	VK6KZ/6	23/01/80	2784.2
VK4	**VK4ZSH/4**	**JA7OXL**	**24/04/83**	**6616.9**
VK5	VK5ZEE	ZL1HH	15/01/86	3458.8
VK6	VK6KZ/6	VK3YLR/3	23/01/80	2784.2
VK7	VK7ZAH	VK4ZAZ	01/01/87	1910.0
VK8	VK4ZSH/8	JA7OXL	24/10/82	6460.9
EME	VK3ATN	K2MWA/2	28/11/66	16781.0
DIG	VK3ZJC	VK3ZQB	28/11/90	268.6
MOB	VK3KAJ/M	VK6BE	25/01/86	2224.5
70cm Band		**420-450MHz**		
VK2	VK2ZAB	ZL1AKW	13/01/88	2299.8
VK3	VK3ZBJ	VK6KZ/6	23/01/80	**2715.9**
VK5	VK4ZSH/4	ZL2TPY	13/01/88	2401.9
VK5	VK8HY	VK7JG	21/05/85	995.0
VK6	VK8KZ/8	VK3ZBJ	23/01/80	**2715.9**
VK7	VK7JG	VK5NY	21/05/85	995.0
EME	VK6ZT	K2UYH	29/01/83	18726.4
DIG	VK3ZJC	VK3ZQB	28/11/90	268.6

Div	From	To	Date	Distance
ATV	VK3ZPA/T	VK7EM/T	13/12/72	413.0
MOB	VK3KAJ/M	VK6BE	25/01/86	2224.5
50cm Band		**576-585MHz**		
VK2	VK4ZRF/2	VK4ZSH/4	11/12/81	255.4
VK3	VK3ZBJ	VK3KAJ/5	25/02/89	382.9
VK4	VK4ZRF/4	VK4ZSH/4	07/12/81	377.6
VK5	VK3KAJ/5	VK3ZBJ	25/02/89	382.9
VK6	VK6KZ/6	VK6HK	16/01/83	196.4
MOB	VK3KAJ/M	VK3ZBJ	26/02/89	122.5
23cm Band		**1240-1300MHz**		
VK1	VK4ZSH/1	VK1VP/2	12/08/90	104.7
VK2	VK2BDN	ZL1AVZ	09/12/82	2132.7
VK3	VK3ZBJ	VK6WG	18/03/88	2449.3
VK4	AX4NO/4	AX4ZT/2	12/04/70	402.0S
VK5	VK5MC	VK6KZ/8	23/01/80	2289.4
VK6	VK6WQ	VK3ZBJ	18/03/88	2449.3
VK7	VK7ZAH	VK3AKC	17/02/71	439.0
EME	VK6ZT	K2UYH	29/01/83	18726.4
MOB	VK3KKW/M	VK3ZJC/M	16/09/89	137.6
13cm Band		**2300-2450MHz**		
VK2	VK2ZAC/2	VK2BDN/2	19/05/73	159.9
VK3	VK3ZHP	VK7HL	12/01/85	427.3
VK5	VK5QR	VK6WG	17/02/78	1885.5
VK6	VK6WO	VK5QR	17/02/78	1885.5
VK7	VK7HL	VK3ZHP	12/01/85	427.3
9cm Band		**3300-3600MHz**		
VK2	VK2AHC/2	VK3SB/2	16/01/77	114.1
VK3	VK3KAJ/3	VK3ZBJ	25/01/86	244.3
VK5	VK5OR	VK5WQ	26/01/88	1885.5
VK8	VK8WG	VK5OR	25/01/86	1685.5

Div	From	To	Date	Distance
6cm Band		**5650-5850MHz**		
VK1	VK4ZSH/1	VK1VP/2	13/08/90	66.8
VK2	VK4ZSH/2	VK2ZBW/4	29/04/90	144.3
VK3	VK4ZSH/3	VK3ZBJ	14/04/90	89.8
VK4	VK4ZSH/4	VK4ZBW/4	22/04/90	173.4
VK5	VK5NT	VK5ZO/5	12/11/88	178.4
3cm Band		**10-10.5GHz**		
VK2	VK2AHC/2	VK2SB/2) VK2ZND/2)	12/04/75	114.1
VK3	VK3KAJ/3	VK3ZBJ/3	08/02/86	252.1
VK4	VK4ZNC/4	VK4ZSH/4	09/11/81	170.6
VK5	VK5NT/5	VK5ZO/5	10/06/90	214.6

VK2AHC: now VK5ZO
VK2ZAL: now VK2ZPB
VK3ZPA: now VK3AU
VK3YLR: now VK3KAQ
VK3AKC: R Wilkinson (deceased)

To apply for a record
The following information is required: Date, time, frequency, mode, signals reports and some details of equipment used; signed letters from applicants OR both QSL cards (originals or photocopies certified by another amateur); and the latitude and longtitude of both stations.
All cards and other material will be returned unless the applicant indicates that the material may be kept for WIA records.
Applicants receive acknowledgement by letter and in "Amateur Radio" and the Call Book. Certificates will also be sent to all new record holders.
Send applications to the Chairman, WIA Federal Technical Advisory Committee, PO Box 300, Caulfield South, Vic 3162.

Voice Repeaters

The columns at the right show ERP in watts, height above sea level in metres, timeout time in minutes, and operating status.

Repeater licensees or sponsors are identified by a letter code in the LICENSEE column - see the Licensee list. Any special notes, including linking information where available, are given in the NOTES column. Please send any additions or corrections to the Chairman, FTAC, PO Box 300, Caulfield South, Vic. 3162.

Key to Status (ST) codes:
A = licence application pending
O = operating
L = licensed but not on air
T = testing
P = planning/development stage

BAND	STATE	OUTPUT FREQ	INPUT FREQ	CALL SIGN	SITE	SERVICE AREA	ST	ERP	HASL	TIME OUT	LICENSEE	NOTES
10 METRE BAND	NEW SOUTH WALES	29.620	29.520	VK2RAH	Wollongong		O				NIL	
	VICTORIA	29.640	29.540	VK3RHF	Mt Dandenong	Melbourne	O		600	2.5	VTF	15
	QUEENSLAND	29.660	29.560	VK4R??	Brisbane		P				QRC	
	SOUTH AUSTRALIA	29.620	29.520	VK5RLZ	Elizabeth	Adelaide	L	50	82		SEL	
	WESTERN AUSTRALIA	29.680	29.580	VK6RHF	Perth		P				WRG	
6 METRE BAND	NEW SOUTH WALES	53.575	52.575	VK2RJB	Sanctuary Point	Jervis Bay	P				NJB	
		53.575	52.575	VK2RTM	Tamworth	Tamworth	P				NTM	
		53.625	52.625	VK2RSN	Mt Sugarloaf	Newcastle	O		400		NAU	
		53.675	52.675	VK2RMB	Terrey Hills	Sydney	P				NMW	
		53.850	52.850	VK2RWI	Dural	Sydney	O	10	420	3.5	NWI	
	VICTORIA	53.550	52.550	VK3RMH	Wattle Glen	Melbourne	O				VNE	
		53.575	52.575	VK3RDD	Dandenong	Dandenong	O				VGG	
		53.675	52.675	VK3RTN	Lake Mountain	Melbourne	O	25	1500	2.5	VSG	1
		53.900	52.900	VK3RMS	Mt Dandenong	Melbourne	O	60	600	2.5	VWI	
		53.975	52.975	VK3RGM	Mt Buller	Mansfield	O	25	1800	2.5	VSG	5
	QUEENSLAND	53.725	52.725	VK4RGA	Amy's Peak	Gladstone	O	25	920		QGL	
		53.725	53.125	VK4RIK	Mt Haren	Cairns	P		480		QTR	
		53.775	52.775	VK4R??	Mackay		P				QMK	

BAND	STATE	OUTPUT FREQ	INPUT FREQ	CALL SIGN	SITE	SERVICE AREA	ST	ERP	HASL	TIME OUT	LICENSEE	NOTES
	WESTERN AUSTRALIA	53.800	52.800	VK6RTH	Tic Hill	Perth	O	10	230		WRG	
	TASMANIA	53.825	52.825	VK7RMD	MtDuncan	NW Tasmania	T	30	600	5.0	TNA	
2 METRE BAND	ACT	146.900	146.300	VK1RAC	Black Hill	Canberra	O	60	870	4.0	AWI	
		146.950	146.350	VK1RGI	Mt Ginini	SE NSW	O	50	1770	3.0	AWI	
	NEW SOUTH WALES	146.625	146.025	VK2RBB	Byron Bay	Lismore	O	10	150	3.0	NSU	
		146.625	146.025	VK2RLD	Liverpool	Liverpool	O	10	330	4.5	NLI	
		146.650	146.050	VK2RCH	Mt Coramba	Coffs Harbour	O		300	3.0	NCH	
		146.650	146.050	VK2RDX	Mt Bindo	Penshurst	O	50	1362	3.5	NSG	
		146.650	146.050	VK2RMI	Terry Hi Hi	Inverell	O	10	660	4.0	NNW	
		146.675	146.075	VK2RCV	Sth Grafton	Lismore	P	30	110	3.0	NSU	
		146.675	146.075	VK2RFT	Forster	Forster	P	10	65	3.0	NGL	
		146.700	146.100	VK2RAO	Mt Canobolas	Orange	O	50	1417	3.0	NOA	
		146.700	146.100	VK2RMU	Littls Forest	Ulladulla	O	35	152	2.5	NMS	
		146.700	146.100	VK2RPM	Middle Brother	Port Macquarie	O	50	552	3.5	NOX	
		146.725	146.125	VK2RAG	Somersby	Gosford	O	40	316	3.0	NCC	14
		146.750	146.150	VK2RFS	Mt Mumbulla	Merimbula	O	10	870	3.5	NFS	
		146.750	146.150	VK2RTM	Mt Crawney	Tamworth	O	20	1430	3.0	NTM	
		146.750	146.150	VK2RWG	Mt Flackney	Wagga	O	25	490	3.0	NWG	
		146.775	146.175	VK2RTZ	Sugarloaf Ra	Port Macquarie	O	10	400	3.0	NWE	
		146.800	146.200	VK2RCC	Needle Mtn	Coonabarabran	O	80	1100	3.5	NOR	
		146.800	146.200	VK2RIC	Goonellabah	Lismore	O	15	85	3.0	NSU	
		146.800	146.200	VK2RLE	Heathcote	Sydney	O	100	240	3.5	NSG	
		146.800	146.200	VK2RTD	Mt Kendall	Tumut	O	36	930	4.0	NTU	
		146.825	146.225	VK2RET	Bundook Mtn	Taree	O	25	435	3.0	NTR	
		146.825	146.225	VK2RHR	Mt Gibraltar	Southern Highlands	P	10	862	3.0	NSO	
		146.850	146.250	VK2RAB	Mt Kaputar	Gunnedah	O	10	1225	4.0	NTM	
		146.850	146.250	VK2RAW	Mt Murray	Wollongong	O	100	769	4.0	NIL	
		146.850	146.250	VK2RGF	Mt Bingar	Griffith	O	15	450	2.5	NGR	
		146.875	146.275	VK2RMB	Terrey Hills	Sydney	O	50	150	3.0	NMW	
		146.900	146.300	VK2RAN	Mt Sugarloaf	Newcastle	O	70	300	5.0	NHB	
		146.900	146.300	VK2RRT	Boona	Mount Condobolin	O	10	441	5.0	NAL	
		146.925	146.325	VK2RGR	North	Ryde Gladesville	O	10	30	2.5	NGA	
		146.950	146.350	VK2RNE	Mt Rumbee	Glen Innes	O	10	1503	4.0	NNW	
		146.975	146.375	VK2RAN	Mt Sugarloaf	Newcastle	O	10	300	5.0	NLH	19
		147.000	146.400	VK2RWI	Parramatta	Sydney	O	120	240	3.5	NWI	
		147.025	147.625	VK2ROT	Paddington	Sydney	O	20	90	3.0	NOT	
		147.050	147.650	VK2RBM	Mt Druitt	Blue Mts/Nepean	O	20	900	3.5	NBM	
		147.075	147.675	VK2RCZ	Mt Druitt	West Sydney	A	20	150	3.0	NCA	
		147.075	147.675	VK2RPW	Nowendoc	Walcha	A	25	1450	2.0	NWR	
		147.100	147.700	VK2RWM	Grenfell	Grenfell	O	70	575	3.0	NCW	
		147.100	147.700	VK2RZL	Mt Arthur	Teralba	L	10	800	3.0	NWE	
		147.125	147.725	VK2RWS	Portable	Statewide	O				NWW	
		147.150	147.750	VK2RWS	St Leonards	Sydney	O	10	140	30s	NWW	14
		147.175	147.775	VK2RWS	St Leonards	Sydney	O				NWW	
		147.200	147.800	VK2RSO	Mt Cambewarra	Nowra	O	10	600	4.0	NSH	
		147.200	147.800	VK2RWH	Warners Bay Hunter-New	England	O				NWW	
		147.225	147.825	VK2RST	Lane Cove	Sydney	O	10	25	4.0	NGA	20
		147.250	147.850	VK2RNS	Hornsby Heights	Sydney	O	50	225	3.5	NHO	
		147.275	147.875	VK2RIL	Sublime	Point Wollongong	O	10	398	4.0	NIL	19
		147.275	147.875	VK2RMO	Tamworth	Tamworth	A				NTM	
		147.300	147.900	VK2RTS	Winmallee	Blue Mtns	O	25	370	5.0	NSA	
		147.375	147.975	VK2RGL	Cabbage	Tree Tuncurry	O	25	650	3.0	NGL	
		147.925	147.325	VK2RGN	Mt Gray	Goulburn	O	20	750	3.0	NGN	
	VICTORIA	146.650	146.050	VK3REG	Donald's Knob	East Gippsland	O	40	560	2.5	VWE	2
		146.650	146.050	VK3RGV	Mt Wombat	Shepparton	O	80	800	3.5	VWI	
		146.700	146.100	VK3RML	Mt Dandenong	Melbourne	O	100	600	2.5	VWI	
		146.700	146.100	VK3RNC	Mt Mitta	Mitta Corryong	O		40	2.5	VWI	
		146.700	146.100	VK3RON	Ouyen	Ouyen	O		40	2.5	VWI	
		146.750	146.150	VK3RBA	Mt Buninyong	Ballarat	O	15	750	3.0	VWI	
		146.775	146.175	VK3RUG	Mt Eldon	Alexandra	O	50	650	2.5	VSG	5
		146.800	146.200	VK3RLV	Mt Tassie	Latrobe Valley	O	80	730	2.5	VWE	
		146.800	146.200	VK3RMA	Mildura	Mildura	O	50	50	2.5	VWX	
		146.850	146.250	VK3RMN	Kinglake	Melbourne	P				VWI	
		146.850	146.250	VK3RSB	Chesney Vale	Benalla	T		80	2.5	VWI	
		146.900	146.300	VK3RBS	Smeaton's Hill	Ballarat Nth	O		30	2.5	VWI	
		146.900	146.300	VK3REB	Nungurner	Balmsdale	O		30	2.5	VWI	2
		146.900	146.300	VK3RSH	Swan Hill	Swan Hill	O	80	60	2.5	VSH	
		146.950	146.350	VK3RWZ	Mt William	Grampians	O	50	1170	2.5	VWZ	
		146.975	146.375	VK3RSR	Portable	Statewide	O		adj		VSA	
		147.000	146.400	VK3RGL	Mt Anakie	Geelong	O	160	400	2.5	VWI	
		147.000	146.400	VK3RNE	Mt Big Ben	Wodonga	O	100	1158	2.5	VWY	
		147.025	147.625	VK3RGS	Mt Fatigue	Toora	O	60		2.5	VWI	
		147.025	147.625	VK3RMK	Mt Kerang	Charlton	P				VWI	
		147.050	147.650	VK3RCG	Camberwell	Eastern suburbs	P				VCG	
		147.050	147.650	VK3RGO	Mt Livingstone	Omeo	O	40		2.5	VWI	2
		147.050	147.650	VK3RVL	Robinvale	Robinvale	O	20		2.5	VWI	
		147.050	147.650	VK3RWL	Mt Warrambool	Warrambool	O	40		.5	VWI	
		147.075	147.675	VK3RCR	Montrose	Melbourne	O					
		147.100	147.700	VK3RPB	Mt Porepunkah	Bright	O	5		2.5	VWI	
		147.100	147.700	VK3RSG	Bass Hill	South Gippsland	O	40		3.0	VWI	
		147.100	147.700	VK3RWA	Ben Nevis	Ararat	P	30		2.5	VWI	
		147.125	147.725	VK3RGC	Montpelier	Geelong	O	40		2.5	VWI	
		147.150	147.750	VK3RCV	Mt Alexander	Bendigo	O	40	730	3.0	VWM	
		147.150	147.750	VK3REM	Marimingo Hill	Mallacoota	P				VWI	
		147.175	147.775	VK3REC	Olinda	Melbourne	O	40	600	2.5	VEC	
		147.225	147.825	VK3RWG	Mt Baw Baw	West Gippsland	O	20		2.5	VWE	
		147.250	147.850	VK3RMM	Mt Macedon	Melbourne	O	100	1011	2.5	VWW	
		147.275	147.875	VK3ROW	Mt Cowley	Otway Ranges	O				VWI	
		147.300	147.900	VK3RWP	Portable	Statewide	O	20			VWW	
	QUEENSLAND	146.625	146.025	VK4RGT	Mt Maurice	Gladstone	O	10	225		OGL	
		146.650	146.050	VK4ROM	Grafton Range	Roma	O	30	550		ORO	
		146.675	146.075	VK4RET	Bunya Mtns	Darling Downs	O		1140		OOA	

BAND	STATE	OUTPUT FREQ	INPUT FREQ	CALL SIGN	SITE	SERVICE AREA	ST	ERP	HASL	TIME OUT	LICENSEE	NOTES
		146.675	146.075	VK4RTA	Longlands	Gap Atherton	O	75	1170		QCA	
		146.700	146.100	VK4RAR	Mt Archer	Rockhampton	O	50	608	4.0	QWI	
		146.700	146.100	VK4RAT	Mt Stuart	Townsville	O	100	584	2.5	QTO	
		146.700	146.100	VK4RGC	Springbrook	Gold Coast	O	50	1040		QGC	
		146.700	146.100	VK4RMI	Four Mile Hill	Mt Isa	O	20	500	3.5	QMI	
		146.725	146.125	VK4RSB	Mt Gordon	Bowen	O	50	20		QBW	
		146.750	146.150	VK4RDD	Mt Lofty	Toowoomba	O	30	715	4.5	QDD	
		146.775	146.175	VK4RDY	Mt Dryander	Mackay/Bowen	O		820		QMK	
		146.800	146.200	VK4RBU	Mt Goonaneman	Bundaberg	O	20	620	4.0	QBU	
		146.800	146.200	VK4RTI	Thursday Is	Thursday Is	?					
		146.800	146.200	VK4RWP	Welpa Cape	York	?					
		146.825	146.225	VK4RDT	Gabbinbah	Toowoomba	P	20	723		QDD	
		146.850	146.250	VK4RSC	Buderim	Sunshine Coast	O	40	450		QSC	
		146.875	146.275	VK4RCH	Red Hill	Chinchilla	O	150	340		QCC	
		146.900	146.300	VK4RAI	Mt Stradbroke	Ipswich	O	70	120	4.5	QIP	
		146.900	146.300	VK4RGA	Amy'sPaak	Gladstone	O	100	1010	4.0	QGL	
		146.925	146.325	VK4RRC	Mount Maa	Redcliffe	O	25	520		QRC	
		146.950	146.350	VK4RBD	Blackdown Tld	Blackwater	O	25			QCH	
		146.950	146.350	VK4RCA	Bellonden Ker	Cairns	O	100	1650	4.0	QCA	
		146.975	146.375	VK4RRR	Blue Mtn	Sarina	O	50	600	3.0	QCH	
		147.000	146.400	VK4RBN	Mt Glorious	Brisbane	O	60	630	2.0	QBV	
		147.000	146.400	VK4RMK	Black Mtn	Mackay	O	25	60	5.0	QMK	
		147.100	147.700	VK4HGY	Mt Boulder	Gympie	O	20	496	4.0	QGY	
		147.150	147.750	VK4RAG	Spring Hill	Brisbane	O	80	90	3.5	QWW	
		147.150	147.750	VK4RWI	portable	statewide	O	50			QWW	
		147.300	147.900	VK4RQT	Mt Glorious	Brisbane	O	50	630	3.5	QSA	
		147.650	147.050	VK4RBT	Mt Cotton	Brisbane	O	50	233	4.5	QAR	19
		147.675	147.075	VK4RBT	Mt Cotton	Brisbane	O	50	233	4.5	OAR	19
		147.825	147.225	VK4RDT	Gabbinbah	Toowoomba	P	20	723		ODD	
		147.825	147.225	VK4REG	Manly West	Brisbane	O	50			QRX	
		147.850	147.250	VK4RCB	Mt Devlin	Collinsville	O					
		147.950	147.350	VK4RII	Mt Inkerman	Burdekin	O	30	218		QTO	
		147.975	147.375	VK4RWB	Mt Murchison	Biloela	O	25				
	SOUTH AUSTRALIA	146.650	146.050	VK5RNC	Naracoorte	Naracoorte	O	25	80	2.5	SWI	
		146.700	146.100	VK5RMN	Tha Bluff Port	Pirie	O	55	730	5.0	SWI	3
		146.750	146.150	VK5RAC	Williams Hill	Port Lincoln	O					
		146.800	146.200	VK5REP	Coolanie	Cowell-Eyre Pen	O	60	500	4.0	SWI	3
		146.825	146.225	VK5RSV	Angaston	Barossa Vallay	O	100	400	3.5	SBA	4
		146.850	146.250	VK5RHO	Houghton	Adelaide	O	50	410	3.5	SWI	
		146.900	146.300	VK5RMG	The Bluff	Mt Gambier	O	25	100	5.0	SWI	
		147.000	146.400	VK5RAD	Crafars	Adelaide	O	50	610	3.5	SWI	
		147.925	147.325	VK5RLD	Berri	Rivertand	O	25	86	5.0	SWI	
	WESTERNAUSTRALIA	146.625	146.025	VK6R??	Stirling		P				WRG	
		146.625	146.025	VK6RAT	Forbs Hill	Rottnest Island	P				WRG	
		146.650	146.050	VK6RBY	Bunbury	Bunbury	O	25	20	5.0	WSW	
		146.675	146.075	VK6RCA	Whim Creek	Whim Creek	O				WNW	
		146.675	146.075	VK6RNR	Hudgejah	Northampton	O	25	280	4.0	WGE	
		146.700	146.100	VK6RAP	Roleystone	Perth	O	40	360	4.0	WRG	
		146.725	146.125	VK6RAL	Albany	Albany	O				WSG	
		146.750	146.150	VK6RES	Esperance	Eaperance	P				WES	
		146.750	146.150	VK6RKI	Koolan Island	Kodlan Island	O	40	300	5.0	WNW	
		146.750	146.150	VK6RLM	Leamurdia	Perth	O	20	340	4.0	WRG	
		146.600	146.200	VK6RTH	Tic Hill	Perth	O	60	230	4.0	WRG	
		146.600	146.200	VK6RWP	Karratha	Karratha	O				WNW	
		146.625	146.225	VK6RAA	Mt Barker	Albany	O	40	430	3.0	WSG	
		146.650	146.250	VK6REX	Exmouth	Exmouth	O	25	385	3.0	WNW	
		146.850	146.250	VK6RKB	Kambalda	Kambalda	O	30			WGO	
		146.675	146.275	VK6RSR	O'Connor	Perth-Fremantle	P				WSR	
		146.900	146.300	VK6RMW	Mt William	Bunbury	O	20	520	4.0	WRG	
		146.950	146.350	VK6RPO	Fremantle	Fremantia	O	45	65	3.0	WRG	
		146.950	146.350	VK6RSG	Shay Gap	Shay Gap	O				WNW	
		146.975	146.375	VK6REE	Portable	(sac) Statewide	O	20		4.0	WRG	
		147.000	146.400	VK6RAK	Kalgoorlie	Kalgoortie	O	40	400	5.0	WGO	
		147.000	146.400	VK6RAW	Fairfield	Katanning	O	25		5.0	WKA	
		147.000	146.400	VK6REE	Portable (pri)	Statewide	O	20		4.0	WRG	
		147.000	146.400	VK6RGN	Geraldton		O	16	400	5.0	WGE	
		147.000	146.400	VK6RNW	Pt Hedland	Port Hedland	O				WNW	
		147.100	147.700	VK6RWC	Millendon	Perth	O				WWA	11
		147.125	147.725	VK6RHB	Gin Gin	Gin Gin	P				WSA	
		147.150	147.750	VK6RMJ	Manjimup		P				WSW	
		147.175	147.675	VK6RIC	Portable emerg.	Statewide	O				WWW	
		147.200	147.800	VK6RCT	Cataby	Cataby	O	10	200	4.0	WRG	12
		147.225	147.625	VK6RHW	Hoddywell	Toodyay	O	30	450	3.0	WRG	12
		147.250	147.850	VK6RMS	Saddleback	Boddington	O	20	630	4.0	WRG	
		147.275	147.875	VK6RWM	Wyalkatchem	Wyalkatchem	O	20	400	4.0	WRG	12
		147.300	147.900	VK6REN	Eneabba		P				WRG	
		147.350	147.950	VK6RBN	Bussalton	Busselton	O	10	130	4.0	WRG	
	TASMANIA	146.625	146.025	VK7RAD	Mt Duncan	NW Tas	O	3	600		TWU	19
		146.700	146.100	VK7RHT	Mt Wellington	Hobart	O	70	1310	3.0	TWS	
		146.750	146.150	VK7RNW	Lonah NW	Tasmania	O	30	160	5.0	TWU	
		146.900	146.300	VK7REC	Snow Hill	East Coast	O	10	970		TEC	
		147.000	146.400	VK7RAA	Mt Barrow	Launceston	O	60	1400		TWN	
		147.075	147.675	VK7RWC	Mt Raid	West Coast	O	10	1200	3.0	TWC	
		147.250	147.850	VK7RAF	Mt Faulkner	Hobart	O	25				
	NORTHERN TERRITORY	146.650	146.050	VK8RMS	Nhulunbuy	Gove	O	25	150		SGR	
		146.700	146.100	VK8RDA	Karama	Darwin	O	15	200	8.5	SDA	
		146.950	146.350	VK8RCA	Alice Springs	Alice Springs	O	25	300	3.0	SWI	
		147.000	146.400	VK8RTE	Palmerston	Darwin	O	15	350	8.5	SDA	
70 CM BAND	ACT	438.375	433.375	VK1RIR	Isaacs Ridge	Canberra	O	60	790	3.5	AWI	
		438.525	433.525	VK1RGI	Mt Ginini SE	NSW	O	60	1770	3.5	AWI	
	NEW SOUTH WALES	438.025	433.025	VK2RTK	High Range	Southern Highlands	O	40	827	2.0	NSO	
		438.075	433.075	VK2RAG	Somersby	Gosford-Wyong	O	120	323	3.0	NCC	

BAND	STATE	OUTPUT FREQ	INPUT FREQ	CALL SIGN	SITE	SERVICE AREA	ST	ERP	HASL	TIME OUT	LICENSEE	NOTES
		438.125	433.125	VK2RMU	Little Forest	Milton	L	18	330	3.0	NMS	
		438.175	433.175	VK2RMB	Tarrey Hills	Sydney	O	5	150	3.0	NMW	
		438.175	433.175	VK2RNT	Doughboy	Mtn Armidale	O			3.0	NAD	
		438.225	433.225	VK2RPW	Nowendoc	Walcha	A	25	1450	2.0	NWR	
		438.225	433.225	VK2RUW	Port Kambla	Wollongong	O	40	100	4.0	NIL	
		438.275	433.275	VK2RWS	Chatswood	Sydney	O	2	140	30s	NWW	
		438.325	433.325	VK2REE	Mt Marie	Taree	O	4	930	3.0	NTR	
		438.325	433.325	VK2RGN	Mt Gray	Goulburn	L	10	750	3.5	NGN	
		438.325	433.325	VK2RWM	Grenfell	Grenfell	P	25	575	3.0	NCW	
		438.375	433.375	VK2RUT	Kurrajong	Springwood	O	15	500	3.0	NBM	
		438.425	433.425	VK2RUH	Hurstville	Sydney	O	25	100	4.0	NSG	
		438.475	433.475	VK2RRS	Chatswood	Gladesville	O	10	50	4.0	NGA	
		438.525	433.525	VK2RPM	Middle Brother	Pt Macquarie	L	10	552	3.0	NOX	
		438.525	433.525	VK2RWI	Dural	Sydney	O	48	240	3.5	NWI	
		438.625	433.625	VK2RUM	New Lambton	Newcastle	O	5	50	3.0	NAG	
		438.675	433.675	VK2RAN	Mt Sugarloaf	Newcastle	O	80	300	5.0	NHB	
		438.675	433.675	VK2RSC	Mt Nardi	Lismore	O	10	300	3.0	NSU	
		438.675	433.675	VK2RTW	Wilans Hill	Wagga	?	10			NWG	
		438.725	433.725	VK2RIL	Sublime Point	Wollongong	O	10	398	4.0	NIL	
		439.275	434.275	VK2RSD	Mt Cambewarra	Nowra	P		600		NSH	
		439.375	434.375	VK2RTM	Tamworth	Tamworth	P				NTM	
		439.425	434.425	VK2RCZ	Mt Druitt	West Sydney	L	20	150	3.0	NCA	
		439.575	434.575	VK2RJB	Sanctuary Point	Jervis Bay	A				NJB	
	VICTORIA	438.025	433.025	VK3R??	Melbourne	City	P				VWI	
		438.075	433.075	VK3RMU	Mt St Leonard	Melbourne	O	200	1028	2.5	VWI	
		438.175	433.175	VK3RUG	Mt Buller	Alexandra	O	80	650	2.5	VSG	1
		438.225	433.225	VK3ROU	Mt Dandenong	Melbourne	O	100	600	2.6	VWI	
		438.275	433.275	VK3RWE	Portable	Statewide	O				VWW	
		438.375	433.375	VK3RGU	Carrajung	Gippsland	O	60		4.0	VWE	
		438.425	433.425	VK3RCU	Mt Mokagul	Bendigo	O				VWI	
		438.475	433.475	VK3RBU	Mt Hollowback	Ballarat	T	40		2.5	VWI	
		438.525	433.525	VK3RAD	Mitcham	Melbourne	O	80	100	2.5	VSG	1
		438.525	433.525	VK3RNU	Mt Stanley	Wangaratta	O	60	1051	2.5	VWI	
		438.525	433.525	VK3RRU	Merbein	Mildura	O	20		2.5	VWI	
		438.625	433.625	VK3RWI	Portable	Statewide	O	5			VWW	
		438.675	433.675	VK3RWU	Mt William	Grampians	O	100	1170	3.0	VWI	
		438.750	433.750	VK3RHF	Mt Dandenong	Melbourne	O		600	2.5	VTF	15
		439.275	434.275	VK3RMM	Mt Macedon	Melbourne	O	100	1011	3.0	VWW	
		439.375	434.375	VK3RSE	Glen Waverley	Melbourne	O				VSU	
		439.425	434.425	VK3RDU	Mt Wombat	NE Victoria	O		800		VWI	
		439.575	434.575	VK3RGL	Mt Anakie	Geelong	O		60	2.5	VWI	
		439.675	434.675	VK3RZU	Mt Buller	Mansfield	T		1800		VWI	
		439.725	434.725	VK3RPU	Arthur's Seat	Melbourne	O	40		2.5	VWI	
		439.875	434.875	VK3RSU	Mt Major	Shepparton	L				VWI	
	QUEENSLAND	438.025	433.025	VK4RTQ	Mt Tambourine	Brisbane	O	50	500		OSA	
		438.075	433.075	VK4RSC	Buderim	Sunshine Coast	O	20	450		QSC	
		438.225	433.225	VK4RAT	Mt Stuart	Townsville	O	10	584		QTO	
		438.225	433.225	VK4RDG	Mt Archer	Rockhampton	O	25	606		QWC	
		438.225	433.225	VK4RGC	Springbrook	Gold Coast	O	50	500	3.5	QGC	
		438.375	433.375	VK4RWM	Ipswich	Ipswich	O		560		QIP	
		438.425	433.425	VK4RMU	Mt Dryander	Mackay/Bowen	O		820		QMK	
		438.475	433.475	VK4RXX	Maleny SE	Old	O				QRX	
		438.500	433.500	VK4RHR	Drummond	Range Clermont	O	50	520		QCH	
		438.525	433.525	VK4RBC	Mt Coot-tha	Brisbane	O	20	560	2.0	QBV	
		438.625	433.625	VK4RAG	Spring Hill	Brisbane	O	20	90		QWW	
		436.625	433.625	VK4RWI	Portable	statewide	O	50			QWW	
		436.675	433.675	VK4RBU	Mt Goonaneman	Bundaberg	O	10	620		QBU	
		436.700	433.700	VK4RET	Bunya Mtns	Darling Downs	O	75	1000	5.0	QDA	
		438.825	433.625	VK4RGY	MtBoulder	Gympie	O	20	496		QGY	
		438.875	433.675	VK4RMC	Mt Corolla	Gympie	O					
		438.950	433.950	VK4RBA	Redbank	PlainsRedbank	O	10	160		QBA	
		439.275	434.275	VK4RDU	Picnic Point	Toowoomba	O		710		ODD	
		439.350	433.350	VK4RIK	Mt Haren	Cairns	O	5	460		QTR	
		439.900	433.900	VK4REX	Darlington	Ra Beenleigh	O	20				
		439.950	433.950	VK4RIY	Mt Kynoch	Toowoomba	O					
	SOUTHAUSTRALIA	438.325	433.325	VK5ROH	Mt Gambier	Mt Gambier	O	15	135	3.5	SWI	
		438.425	433.425	VK5RBV	Angaston	Barossa Valley	O	100	400	3.5	SBA	4
		438.525	433.525	VK5RVP	Crafers	Adelaide	O	30	590	3.0	SWI	
	WESTERNAUSTRALIA	438.225	433.225	VK6RTH	TicHill	Perth	O		230		WRG	
		438.525	433.525	VK6RUF	Roleystone	Perth	O	20	360		WRG	12
		438.675	433.675	VK6RBN	Bussalton	Busselton	P	130			WRG	
	TASMANIA	438.500	433.500	VK7RIN	Barren Tier	Central Tas	O	25	1200		TAR	
		438.550	433.550	VK7RAB	Mt Arthur NE	Tasmania	O	6	1190		TW	
		438.600	433.600	VK7RTC	Mt Nelson	Hobart	O	6			TAR	
		438.650	433.650	VK7RAC	Ridgeley NW	Tasmania	O	3	250	5.0	TWU	
	NORTHERN TERRITORY	438.275	433.275	VK8RDU	Darwin	Darwin	O	8	200	3.0	SDA	
23CM BAND	NEW SOUTH WALES	1281.100	1293.100	VK2RJB	Sanctuary Point	Jervis Bay	A				NJB	
		1281.750	1293.750	VK2RWI	Dural	Sydney	O	10	240	3.0	NWI	
	VICTORIA	1281.???	VK3RMU	Mt St	Leonard	Melbourne	P		1028		VWI	
	QUEENSLAND	1281.650	1293.650	VK4REX	Darlington	Ra Beenleigh	O	10				
	SOUTH	AUSTRALIA	128?.???	VK5RWH	Adelaide		O	25	200	3.0	SST	18

Packet Radio Repeaters and BBS Systems

The columns at the right show ERP in watts, height above sea level in metres, timeout time in minutes, and operating status. Licensees or sponsors are identified by a letter code in the LICENSEE column - see the Licensee list. Please send any additions or corrections to the Chairman, FTAC, PO Box 300, Caulfield South, VIC 3162.

Key to STATUS codes:
A = licence application pending
L = licensed but not on air
P = planning/development stage
O = operating
T = testing

Note: In New South Wales, many systems are to move from 147 MHz to 144 MHz. he proposed 44 MHz frequencies are shown, marked P in the STATUS column.

STATE	FREQUENCY	CALL SIGN	SITE	SERVICE AREA	STATUS	ERP	HASL	TIME OUT	LICENSEE	NOTES
ACT	144.800	VK1RGI	Mt Ginini	SE NSW	O	60	1770		AWI	8
NEW SOUTH WALES	144.700	VK2RAB	Mt Kaputar	Tamworth-Narrabri	P				NTM	
	144.700	VK2RAG	Somersby	Gosford-Wyong	P	50	313	3.0	NCC	16
	144.700	VK2RAY	Albury	Albury	P				NTC	
	144.725	VK2RDX	Mt Bindo	Blue Mtns West	O	20	1362	3.5	NSG	
	144.750	VK2RAB	Mt Kaputar	Tamworth-Narrabri	P				NTM	17
	144.750	VK2RGN	Goulburn		P					
	144.750	VK2RTM	Mt Crawney	Tamworth	O				NTM	
	144.775	VK2RAW	Mt Murray	Wollongong	P	50	769	1.0	NIL	16
	144.775	VK2RPW	Nowendoc	Walcha	A				NWR	
	144.775	VK2RWG	Wagga		P					
	144.800	VK2RMB	Teney Hills	Sydney	O	25	150	10s	NMW	
	144.825	VK2R??	Bathurst		P					
	144.825	VK2RFS	Bega		P					
	144.825	VK2RGF	Mt Bingar	Griffith	P		450		NGR	
	144.825	VK2RPN	Teralba	Newcastle	P	10	400		NWE	16
	144.850	VK2RLO	Mt Lookout		P				NSU	
	144.850	VK2RPT	Mt Tumorrama	Tumut	P	20	1231	5.0	NTU	
	144.850	VK2RWI	Dural	Sydney	O	10	240	30s	NWI	
	144.875	VK2RAO	Mt Canobolas	Orange	P	20	1417	30s	NOA	
	144.875	VK2RPL	Mt Nardi	Lismore	P	25	85	3.0	NSU	
	144.875	VK2RPM	Middle Brother	Port Macquarie	O		552		NOX	
	144.875	VK2RSD	Mt Cambewarra	Nowra	P		600		NSH	
	144.900	VK2RCC	Needle Mtn	Beaucubbin	O				NOR	
	144.900	VK2RCH	Mt Coramba	Coffs Harbour	P				NCH	
	144.900	VK2RMU	Little Forest	Milton	P				NMS	
	144.900	VK2RPH	Hornsby	Sydney	O	10	200		NHO	
	144.925	VK2RET	Taree	Taree	P				NTR	
	144.925	VK2RPS	High Range	Mittagong	P	50	827		NSO	
	145.050	VK2RPL	Mt Nardi	Lismore	O	25	85	3.0	NSU	
	147.575	VK2RAB	Mt Kaputar	Tamworth-Narrabri	O				NTM	
	147.575	VK2RAO	Mt Canobolas	Orange	O	20	1417	30s	NOA	
	147.575	VK2RAW	Mt Murray	Wollongong	O	50	769	1.0	NIL	16
	147.575	VK2RCH	Mt Coramba	Coffs Harbour	O				NCH	
	147.575	VK2RDX	Mt Bindo	Blue Mtns West	O	20	1362	3.5	NSG	
	147.575	VK2RET	Taree	Taree	P				NTR	
	147.575	VK2RGF	Mt Bingar	Griffith	O		450		NGR	
	147.575	VK2RLO	Mt Lookout		O				NSU	
	147.575	VK2RMU	Little Forest	Milton	O				NMS	
	147.575	VK2RPL	Mt Nardi	Lismore	O	25	85	3.0	NSU	
	147.575	VK2RPN	Teralba	Newcastle	O	10	400		NWE	16
	147.575	VK2RPS	High Range	Bowral	O	50	827		NSO	
	147.575	VK2RPT	Mt Tumorrama	Tumut	O	20	1231	5.0	NTU	
	147.575	VK2RPW	Mt Grundy	Walcha	O				NWR	
	147.575	VK2RSD	Mt Cambewarra	Nowra	O		600		NSH	
	147.575	VK2RTM	Mt Crawney	Tamworth	O				NTM	
	147.600	VK2RAG	Somersby	Gosford-Wyong	O	50	313	3.0	NCC	16
	438.875	VK2RPL	Mt Nardi	Lismore	?	25	85	3.0	NSU	
	439.075	VK2RAG	Somersby	Gosford	O				NCC	
VICTORIA	144.800	VK3RPK	Red Hill	Melbourne	L	25	240		VWI	
	144.900	VK3RPP	Lysterfield	Melbourne	O	25	100		VWI	
	147.525	VK3RBB	Mt Tassie	Gippsland	T	20	730		VWI	
	147.575	VK3RCU	Mt Moliagul	Bendigo	O				VWI	
	147.575	VK3RGU	Carrajung	East Gippsland	T				VWE	
	147.575	VK3RGV	Mt Wombat	Shepparton	O	25	800		VWI	
	147.575	VK3RMU	Mt St Leonard	Melbourne	O	25	1028		VWI	
	147.575	VK3RNU	Mt Stanley	Wodonga	O	25	1051		VWI	
	147.575	VK3RPA	St Albans	Melbourne	O	10	83		VWI	
	147.575	VK3RPC	Mt Warrenheip	Ballarat	O	20	741		VWI	
	147.575	VK3RPG	Mt William	Grampians	O		1170		VWI	
	147.575	VK3RPM	Specimen Hill	Bendigo	O	25	240		VWI	
	147.575	VK3RPN	Mt McKay	NE Vic	O		1840		VWI	
	147.575	VK3RPS	Mt Holden	Melbourne	O	25	320		VWI	
	147.575	VK3RRU	Merbein	Mildura	T	25			VWI	
	147.600	VK3RPA	St Albans	Melbourne	O	45	83		VWI	
	147.600	VK3RPC	Mt Warrenheip	Ballarat	O	20	741		VWI	
	147.600	VK3RPS	Mt Holden	Melbourne	O	25	320		VWI	
	430.075	VK3RPP	Lysterfield	Melbourne	L	25	100		VWI	
	439.050	VK3RPA	St Albans	Melbourne	L		83		VWI	
	439.050	VK3RPS	Mt Holden	Melbourne	L	25	320		VWI	

STATE	FREQUENCY	CALL SIGN	SITE	SERVICE AREA	STATUS	ERP	HASL	TIME OUT	LICENSEE	NOTES
QUEENSLAND	144.850	VK4RZB	Constitution H	Brisbane	O	20	230		QDG	
	144.900	VK4RAR	Mt Archer	Rockhampton	O		600		QWC	
	144.900	VK4RBD	Blackdown T'ld	Blackwater	O				QCH	
	144.900	VK4RBS	Mt Goonaneman	Bundaberg	O		650		QBU	
	144.900	VK4RGA	Amy's Peak	Gladstone	O	25	1010		QGL	
	144.900	VK4RIK	Mt Haren	Cairns	O	10	480		QTR	
	144.900	VK4RZC	Wilkes Knob	Sunshine Coast	O	20	470		QDG	
	144.900	VK4RZE	Mt Mowbullan	Darling Downs	O	25			QDG	
	145.050	VK4RBT	Mt Cotton	Brisbane	O	50	233		QAR	
	147.600	VK4RSA	Maleny	Maleny	?					
	147.600	VK4RZA	Springbrook	Gold Coast	O	20	940		QDG	
	147.600	VK4RZB	Constitution H	Brisbane	O	20	230		QDG	
	147.600	VK4RZC	Wilkes Knob	Sunshine Coast	O	20	470		QDG	
	147.600	VK4RZD	Mt Perseverance	Toowoomba	O	20	700		QDG	
	147.600	VK4RZE	Mt Mowbullan	Darling Downs	O	25			QDG	
SOUTH AUSTRALIA	144.900	VK5RSV	O'Halloran Hill	Adelaide	O				SWI	
	147.575	VK5LZ	lizabeth	Adelaide	O				SEL	
	147.575	VK5RBP	Roseworthy	Barossa Valley	O				SWI	
	147.575	VK5RMN	The Bluff	Port Pirie	O		730		SWI	9
	147.575	VK5RPM	Mt Graham	Millicent	O	100	225		SER	
	147.575	VK5ZLW	Crafers	Adelaide	O					10
	147.600	VK5RPG	Collinswood	Adelaide	O					
WESTERN AUSTRALIA	144.850	VK6BBS	Roleystone	Perth	O		360		WTT	
	144.850	VK6R??	Busselton		P				WDC/WRG	
	144.850	VK6RAA	Mt Barker	Albany	O		430		WSG	
	144.850	VK6RAP	Roleystone	Perth	O		360		WDC/WRG	
	144.850	VK6RAW	Fairfield	Katanning	O				WKA	
	144.850	VK6RDT	Tic Hill	Perth	P		230		WDC/WRG	
	144.850	VK6RMS	Saddleback	Boddington	O		630		WDC/WRG	
TASMANIA	147.575	VK7RED	Snow Hill	East Coast	?		970		TEC	
	147.575	VK7RIT	Mt Nelson	Hobart	O				TWI	
	147.575	VK7RTY	Mt Barrow	Northern Tasmania	O		1400		TWI	
NORTHERN TERRITORY	147.600	VK8BBS	Alice Springs	Alice Springs	O				SAL	

Index of Repeater and Beacon Licensees

STATE	REF	LICENSEE
VK1 ACT		
	AWI	WIA ACT Division
VK2 NEW SOUTH WALES		
	NAD	Armidale DARC
	NAG	Newcastle ATV Group
	NAL	Albert ARC
	NAN	ANARTS
	NAU	Newcastle ATV/UHF Club
	NBM	Blue Montains ARC
	NCA	Chifley ARC
	NCC	Central Coast ARC
	NCH	Coffs Harbour DARC
	NCW	Central West ARC
	NFS	Far Sth Coast ARC
	NGA	Gladesville ARC
	NGL	Great Lakes RC
	NGN	Goulburn ARC
	NGR	Griffith ARC
	NGU	Gunnedah ARC
	NHB	Hunter Branch RG
	NHO	Hornsby DARC
	NIL	Illawarra ARS
	NJB	Jervis Bay Rprt Grp
	NLH	Lower Hunter ARC
	NLI	Liverpool ARC
	NMS	Mid Sth Coast ARC
	NMW	Manly-Warringah DRC
	NNW	Northwest ARG
	NOA	Orange ARC
	NOR	Orana Region ARC
	NOT	OTC ARG
	NOX	Oxley Region ARC
	NSA	Sydney ATV Group
	NSG	St George ARS
	NSH	Shoalhaven ARC
	NSO	Sth Highlands ARC
	NSU	Summerland ARC
	NTC	Twin Cities REC
	NTM	Tamworth ARC
	NTR	Taree ARC
	NTU	Tumut DARC
	NWE	Westlakes ARC
	NWG	Wagga ARC
	NWH	WIA Hunter Branch
	NWI	WIA NSW Div
	NWR	Walcha Radio Grp
	NWW	VK2 WICEN
VK3 VICTORIA		
	VBA	Ballarat AR Group
	VCG	Camberwell Grammar School
	VEC	EMDRC
	VGG	Gippsland Gate RC
	VNE	North East ARG
	VSA	Vic Scout Assoc
	VSG	Six Metre E. Group
	VSH	Swan Hill DARC
	VSU	SE UHF Repeater Grp
	VTF	10m FM Group
	VWE	WIA Eastern Zone
	VWI	WIA Vic Div
	VWM	WIA Midland Zone
	VWW	VK3 WICEN
	VWX	WIA NW Zone
	VWY	WIA NE Zone
	VWZ	WIA Western Zone
VK4 QUEENSLAND		
	QAR	QARDATA
	QBA	Brisbane ARC
	QBU	Bundabarg ARC
	QBV	Brisbane VHF Group
	QBW	Bowen RAG
	QCA	Cairns ARC
	QCC	Chinchilla RC
	QCH	Central Highlands ARC
	QDA	Dalby DARC
	QDD	Darling Downs RC
	QDG	Old Digital Group
	QGC	Gold Coast ARS
	QGL	Gladstone ARC
	QGY	Gympie ARC
	QIP	Ipswich RC
	QMI	Mt Isa DARG
	QMK	Mackay ARC
	QRC	Redcliffe RC
	QRO	Roma DARS
	QRX	Radio Exp. Group
	QSA	SEQ ATV Group
	QSC	Sunshine Coast ARC
	QTO	Townsville ARC
	QTR	Old Tropical VHF Ass.
	QWC	WIA Cent Old Branch
	QWI	WIA Old Div
	QWW	VK4 WICEN
VK5 SOUTH AUSTRALIA		
	SBA	Barossa ARC
	SCN	Cent North ATV Grp
	SEL	Elizabeth ARC
	SER	SE Radio Group
	SSC	South Coast ARC
	SST	Southern ATV Group
	STV	SA ATV Group
	SWI	WIA SA Div
VK6 WESTERN AUSTRALIA		
	WDC	WAADCA
	WES	Esperance ARS
	WGE	Geraldton ARC
	WGO	Goldfields ARC
	WKA	Katanning ARC
	WNW	Northwest ARS
	WPT	Perth TV Group
	WRG	WA Repeater Group
	WSA	WA Signals ARG
	WSG	Southern Elec Grp
	WSR	Southern River Grp
	WSW	Southwest ARG
	WTT	Think Tank
	WVH	WA VHF Group
	WWA	Western ARS
	WWI	WIA WA Div
	WWK	Wickham ARC
	WWW	VK6 WICEN
VK7 TASMANIA		
	TEC	East Coast ARC
	TMC	Aust Maritime Coll.
	TNA	NW ATV Group
	TWI	WIA Tas Div
	TWN	WIA Northern Branch
	TWS	WIA Southern Branch
	TWU	WIA NW Branch
	TWW	VK7 WICEN
VK8 NORTHERN TERRITORY	SAL	Alice Springs ARC
	SDA	Darwin ARC
	SGR	Gove Repeater Grp

ATV Repeaters

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L = licensed but not on air
T = testing
P = planning/development stage

OUTPUT FREQUENCY	INPUT FREQUENCY	CALL SIGN	SITE	SERVICE AREA	STATUS	ERP	HASL	TIME OUT	LICENSEE	NOTES
		VK2RWI	Parramatta	Sydney	P				NWI	
426.250	444.250	VK2RTW	Willans Hill	Wagga	O	10	300	30	NWG	
579.250	426.250	VK2RPM	Middle Brother	Port Macquarie	L				NOX	
579.250	444.250	VK2RTG	Kariong	Gosford	O	90	220		NCC	
579.250	426.250	VK2RTN	Sugarloaf Ra	Newcastle	O				NLH	
579.250	426.250	VK2RTS	Springwood	Springwood	O	300	370	3.0	NSA	
579.250	444.250	VK2RTV	Lane Cove	Sydney	O	100	60		NGA	
	1250.000	VK2RAG	Somersby	Gosford	O				NCC	
579.250	426.250	VK3REX	Swan Hill	?						
579.250	426.250	VK3RMZ	Mt Alexander	Bendigo	O				VWM	
579.250	444.250	VK3RNE	Mt Big Ben	Wodonga	O				VWY	
579.250	444.250	VK3RTV	Mt Dandenong	Melbourne	O		600		VWI	
579.250	426.250	VK4RTV	Spring Hill	Brisbane	O	100	140		QSA	
444.250	426.250	VK5RCN	Barunga Range	Central North	O	10	400	30	SCN	6
579.250	426.250	VK5RTV	O'Halloran Hill	Adelaide	O	200	200	30	STV	7
1246.250	444.250	VK5RWH	Willunga Hill	Southern Vales	O	40	200	30	SSC	
579.250	444.250	VK6RAP	Perth		T				WRG/WPT	
426.250	444.250	VK7RTV	Mt Duncan	NW Tasmania	O	5	600	30	TNA	
579.250	444.250	VK7RAE	Kelcy Tiers	NE Tasmania	O	5	220	30	TNA	

RTTY Repeaters

The columns at the right show ERP in watts, height above sea level in metres, timeout time in minutes, and operating status. Licensees or sponsors are identified by a letter code in the LICENSEE column - see the Licensee list. Please send any additions or corrections to the Chairman, FTAC, PO Box 300, Caulfield South, VIC 3162.

Key to STATUS codes:
A = licence application pending
O = operating
L = licensed but not on air
= testing
P = planning/development stage

OUTPUT FREQUENCY	INPUT FREQUENCY	CALL SIGN	SITE	SERVICE AREA	STATUS	ERP	HASL	TIME OUT	LICENSEE	NOTES
146.675	146.075	VK2RTY	Blacktown	Sydney	O	40	72	10	NAN	
146.975	146.375	VK2RAN	Mt Sugarloaf	Newcastle	O	10	300	5.0	NHB	19
147.275	147.875	VK2RIL	Sublime Point	Wollongong	O	25	398	4.0	NIL	19
439.325	434.325	VK2RTY	Blacktown	Sydney	P	40	72	10	NAN	
147.325	147.925	VK3RBB	Mt Tassie	Gippsland	O	40	600	10	VWI	
147.350	147.950	VK3RTY	Olinda	Melbourne	O				VWI	
147.650	147.050	VK4RBT	Mt Cotton	Brisbane	O	50	233		OAR	19
147.675	147.075	VK4RBT	Mt Cotton	Brisbane	O	50	233	4.5	OAR	19
146.675	146.075	VK5RSV	O'Halloran Hill	Adelaide	O	25	200	10	SSC	
147.050	147.650	VK6RTG	Roleystone	Perth	O	15	360	10	WRG	
146.625	146.025	VK7RAD	Mt Duncan	NW Tasmania	O	30	600	5.0	TWU	19

Index of Repeater and Beacon Listing Reference Notes as at 21 January 1991

Ref No — Note

1 VK3RTN (53.675), VK3RAD (438.525), VK3RUG (438.175) are linked.
2 VK3REG (146.650), VK3REB (146.900), VK3RGO (147.050) are to be linked.
3 VK5RMN (146.700) AND VK5REP (146.800) are to be inked.
4 VK5RBV 146.825 and 438.525 are linked: access tone 123Hz.
5 VK3RGM (53.975) and VK3RUG (146.775) are linked — 123Hz access.
6 Can be linked to VK5RTV on command: control link 147.3. Link video input 579.25, extra audio input 147.3.
7 Can be linked to VK5RCN on command: control link 147.3. Link video input 444.25, extra audio input 147.4. SSTV input 147.350.
8 4800 baud.
9 Directional beam, aimed south.
10 Callsign to become VK5RAD.
11 77Hz tone access.
12 There are plans to link VK6RCT, VK6RHW and VK6RWM to VK6RUF.
13 After 15 seconds of inactivity, a carrier of at least two-seconds duration is required to regain access.
14 VK2RAG (146.725) and VK2RWS (147.150) are linked.
15 VK3RHF 10-metre repeater link on 438.750 also operates as a repeater in its own right. Tone access 141.3Hz.
16 To remain on 147MHz until Channel 5A closes.
17 Temporary allocation.
18 Frequencies under review.
19 RTTY — voice repeaters.
20 SSTV — voice repeater.
31 CW practice beacons.
32 CW practice beacons — FM mode.
33 To move from 52.485 to 50.043.
34 To move from 144.800 to 144.450 in late 1990.

Acronyms and Abbreviations Used in Amateur Radio

Most of the following letter combinations have been used in amateur radio during the past year or two. In most cases their meanings have been given at the time. Nevertheless, we feel that a comprehensive list is long overdue. We make no claims about its completeness, and would welcome any additions that readers might like to contribute. The list includes all amateur societies affiliated with IARU.

AAPRA	Australian Amateur Packet Radio Association
AARC	Aruba Amateur Radio Club
AARPC	Australian Amateur Radio Postcote (Award)
AART	Addressable Asynchronous Receiver Transmitter
AARTG	Australian Amateur Radio Teleprinter Group
ABARS	Antigua and Barbuda Amateur Radio Society
ABC	Australian Broadcasting Corporation
ABS	Acrylonitrile Butadiene Styrene (a tough plastic)
AC	Alternating Current
ADC	Analog to Digital Converter Aide de Camp
ACW	Anti-Clockwise
AF	Audio Frequency
AFC	Automatic Frequency Control
AFI	Audio Frequency Interference
AFRTS	Armed Forces Radio and Television Service
AFSK	Audio Frequency Shift Keying
AFVL	Amateur Funk Verein Liechtenstein
AGC	Automatic Gain Control
AGM	Annual General Meeting
AGRA	Association Gabonaise des Radio Amateurs
AHARS	Adelaide Hills Amateur Radio Society
ALARA	Australian Ladies' Amateur Radio Association
ALC	Automatic Level (or Load) Control
AM	Amplitude Modulation
AMSAT	Amateur Satellite (Organisation)
AMTOR	Amateur Microprocessor Teleprinter Over Radio
ANARE	Australian National Antarctic Research Establishment
ANARTS	Australian National Amateur Radio Teleprinter Society
ANERCOM	American National Emergency Response Committee
ANZA	Australian, New Zealand, African (net)
AOC	Air Officer Commanding
AOCP	Amateur Operator's Certificate of Procificency
AOS	Acquisition of Satellite (or Signal)
APC	Automatic Phase Control
APG	Australian Preparatory Group
APT	Automatic Picture Transmission
ARA	Amateurs Radio Algeriens
ARAB	Amateur Radio Association of Bahrain
ARAD	Association des Radio Amateurs de Djibouti
ARAI	Association des Radio Amateurs Ivoiriens (Ivory Coast)
ARAS	Association des Radio Amateurs du Senegal
ARCOT	Amateur Radio of Tonga
ARDF	Amateur Radio Direction Finding
ARDXC	Australian Radio DX Club
AREM	Amateur Radio Experiment on Mir
ARGP	Argument of Perigee
ARI	Associazione Radioamatori Italiani
ARM	Association des Radio Amateurs de Monaco
ARRAM	Association Royale des Radio Amateurs du Maroc
ARRL	American Radio Relay League
ARRSM	Associazione Radioamatori della Repubblica di San Marino
ARSB	Amateur Radio Society of Barbados
ARSI	Amateur Radio Society of India
ASCII	American Standard Code for Information Interchange
ASEAN	Association of South East Asian Nations
ATN	Amateur Traffic Net
ATU	Antenna Tuning Unit
ATV	Amateur Television
AVC	Automatic Volume Control
AWA	Amalgamated Wireless Australasia
BARC	Belize Amateur Radio Club
BARG	Ballarat Amateur Radio Group
BARL	Bangladesh Amateur Radio League
BARS	Bahamas (also Botswana) Amateur Radio Society
BARTG	British Amateur Radio Teleprinter Group
BARTS	Burma Amateur Radio Transmitting Society
BASIC	Beginners' All-purpose Symbolic Instruction Code
BATC	British Amateur Television Club
BBC	British Broadcasting Corporation
BBS	Bulletin Board System (or Service)
BCD	Binary Coded Decimal
BCI	Broadcast Interference
BDARA	(Negara) Brunei Darussalam Amateur Radio Association
BFO	Beat Frequency Oscillator
BFRA	Bulgarian Federation of Radio Amateurs
BGB	Burley Griffin Building (VK5 Div)
B-MAC	Multiplexed Analog Components (version B) (used for sattelite TV)
BNC	Bayonet N Connector
BOCP	Broadcast Operator's Certificate of Proficiency
BPSK	Binary Phase Shift Keying
BRAMSAT	Brazilian Amateur Radio Satellite (Organisation)
BSS	Broadcast Satellite Service
BVIRL	British Virgin Islands Radio League
BYLARA	British Young Ladies' Amateur Radio Association
CAA	Civil Aviation Authority
CAD	Computer Aided Design
CAM	Computer Aided Manufacture
CARF	Canadian Amateur Radio Federation
CARS	Cyprus Amateur Radio Society (also Cayman ditto)
CAST	Center for Aero-Space Technology (Ogden, Utah)
CAT	Computer Aided Transceiver
CATV	Community Antenna Television
CBRS	Citizens' Band Radio Service
CCD	Charge-Coupled Device
CCIR	Comité Consultatif Internationale des Radiocommunications
CCITT	Comité Consultatif Internationale des Telegraphie et Telephonie
CD	Civil Defence Compact Disc
CDI	Capacitor Discharge Ignition
CEPT	Comité Européenne des Postes et Telecommunications
CGA	Colour Graphic Adapter
CHARC	Central Highlands Amateur Radio Club
CISPR	Comité Internationale Speciale des Perturbations de Radio
CLARA	Canadian Ladies' Amateur Radio Association
CMOS	Complementary Metal Oxide Silicon
COR	Carrier Operated Relay
CORA	Club Oceanien de Radio et d'Astronomie (Fr Polynesia)
COSPAS	(Russian acronym for Space Search System, Vessels in Distress)
CPI	Consumer Price Index
CP/M	Control Program/Microcomputer
CPU	Central Processing Unit
CRAG	Club de Radioaficionados de Guatemala
CRAS	Club de Radioaficionados de El Salvador
CRCC	Central Radio Club of Czechoslovakia
CREN	Club de Radioexperimentadores de Nicaragua
CRO	Cathode Ray Oscilloscope
CRRL	Canadian Radio Relay League
CRSA	Chinese Radio Sports Association
CRT	Cathode Ray Tube
CSIRO	Commonwealth Scientific & Industrial Research Organisation
CSK	Countersunk
CTCSS	Continuous Tone Code Squelch System
CTDXA	Connecticut DX Association
CW	Continuous Wave Clockwise
DAC	Digital to Analog Converter
DARC	Deutscher Amateur Radio Club (also Dominica)
DBS	Direct Broadcasting by Satellite
DC	Direct Current Direct Coupled
DCE	Digital Communications Experiment
DDRC	Darling Downs Radio Club
DDRR	Directional Discontinuity Ring Radiator
DDS	Direct Digital Synthesis
DF	Direction Finding
DIL	Dual In-Line
DIN	Deutsche Industrie Norm (German standard)
DIP	Dual In-Line Package
DMA	Direct Memory Access
DMM	Digital Multi-Meter
DOS	Disk Operating System
DoTC	Department of Transport and Communications
DOVE	Digital Orbiting Voice Encoder
DPDT	Double Pole Double Throw
DPM	Digital Panel Meter
DPST	Double Pole Single Throw
DRAM	Dynamic Random Access Memory
DSB	Double Side-Band
DSP	Digital Signal Processing
DTL	Diode-Transistor Logic
DTMF	Dual-Tone Multi-Frequency
DVM	Digital Volt-Meter
DX	Distance
DXCC	DX Century Club
DYLC	Deutsche Young Ladies' Club
EARS	Egyptian Amateur Radio Society
ECL	Emitter-Coupled Logic
EDAC	Error Detection and Correction
EDP	Electronic Data Processing
EDR	Eksperimenterende Danske Radioamatorer (Denmark)
EEC	European Economic Community
EGA	Enhanced Graphics Adapter
EHT	Extremely High Tension
EIA	Electronic Industries Association
EIRP	Effective (or Equivalent) Isotropic Radiated Power
ELF	Extremely Low Frequency (300 to 3000 Hz)
ELT	Emergency Locater Transmitter
EMC	Electro-Magnetic Compatibility
EMDRC	Eastern & Mountain Districts Radio Club
EMI	Electro-Magnetic Interference
EMP	Electro-Magnetic Pulse
ENG	Electronic News Gathering
EPROM	Electrically Erasable Programmable Read Only Memory
EQX	Equator Crossing
EPIRB	Emergency Position Indicating Radio Beacon
ERP	Effective Radiated Power
ESA	European Space Agency
ESD	Electro-Static Discharge

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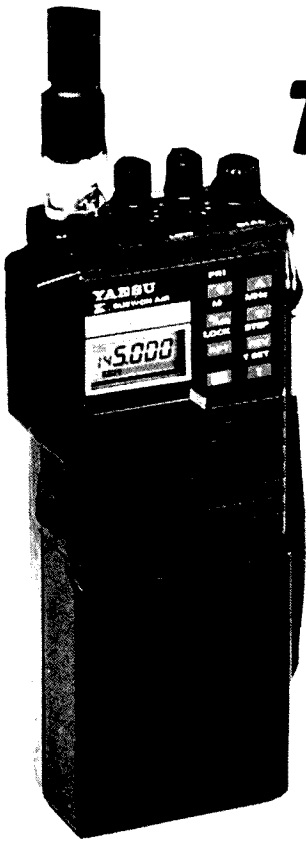

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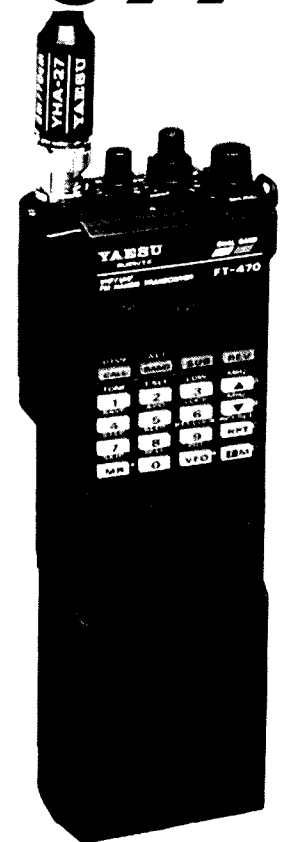

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Why buy 2 hand-helds when you can have everything in one?

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See A.R.A review Vol 12, Issue 5, or A.R. review Aug '89 issue.

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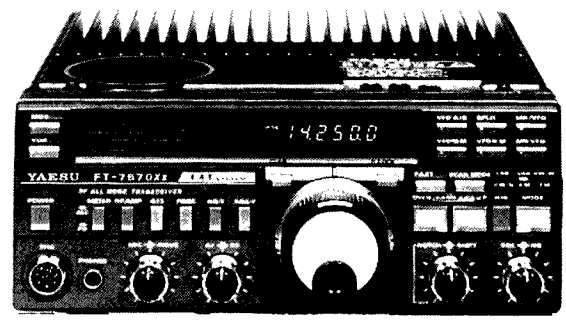

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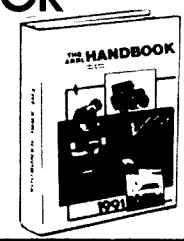

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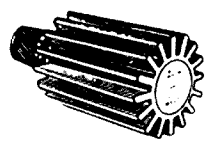

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B1098/J2

ESR	Effective Series Resistance
ESSA	Environmental Science Services Administration
FACTS	Federation of Australian Commercial TV Stations
FAMPARC	Frankston And Mornington Peninsula Amateur Radio Club
FARA	Fiji Association of Radio Amateurs
FARWP	Future of Amateur Radio Working Party
FAX	Facsimile
FCC	Federal Communications Commission (USA)
FCM	Federal Contest Manager
FET	Field Effect Transistor
FFT	Fast Fourier Transform
FIWC	Federal Intruder Watch Co-ordinator
FM	Frequency Modulation
FOC	First(class) Operators' ClubFlag Officer Commanding
FOV	Field of View
FRA	Foroyskir Radio-Amatorar (Faeroe Is)
FRC	Federacion de Radioaficionados de Cuba
FRR	Federatia Romana de Radioamatorism (Rumania)
FSD	Full Scale Deflection
FSK	Frequency Shift Keying
FTAC	Federal Technical Advisory Committee
GARA	Guyana Amateur Radio Association
GARC	(Geelong, Gladesville, Grenada) Amateur Radio Club
GARS	(Ghana, Gibraltar) Amateur Radio Society
GCR	General Certification Rule
GDO	Grid (or Gate) Dip Oscillator
GEOS	Geological (research) Satellite
GGREC	Gippsland Gate Radio & Electronics Club
GHz	Gigahertz
GOC	General Officer Commanding
GOES	Geostationary Operational Environmental Satellite
HARG	Hills (WA) or Healesville (Vic) Amateur Radio Group
HARTS	Hongkong Amateur Radio Transmitting Society
HDLC	High Level Data Link Control
HDTV	High Definition Television
HF	High Frequency (3 to 30 MHz)
HFBC	High Frequency Broadcasting Conference
HMSO	Her Majesty's Stationery Office
HT	High Tension Handy Talky Hand Transceiver
HTA	Heavier Than Air
IARC	Israel Amateur Radio Club
IARN	International Amateur Radio Network
IARU	International Amateur Radio Union
IARUMS	IARU Monitoring Service
IBM	International Business Machines
IC	Integrated Circuit
ID	Identification
IDC	International Data Connector
IEA	Institution of Engineers of Australia
IEC	International Electrotechnical Commission
IEE	Institution of Electrical Engineers
IEEE	Institution of Electrical & Electronic Engineers
IF	Intermediate Frequency
IHU	Integrated Housekeeping Unit
IOC	Index of Co-operation
IPHA	Information Program for Handicapped Amateurs
IPS	Ionospheric Prediction Service
IR	Infra Red
IRA	Islenzkir Radioamatorar (Iceland)
IRC	International Reply Coupon International Resistance Co
IREE	Institution of Radio & Electronic Engineers
IRTS	Irish Radio Transmitters' Society
ISB	Independent Side-Band
ISD	International Subscriber Dialling
ISDN	Integrated Services Digital Network
ISO	International Standards Organisation
ITHE	International Travel Host Exchange
ITT	International Telegraph & Telephone
ITU	International Telecommunications Union
IW	Intruder Watch
IWP	Interim Working Party
JAMSAT	Japan Amateur Satellite (organisation)
JARA	Jamaica Amateur Radio Association
JARL	Japan Amateur Radio League
JFET	Junction Field Effect Transistor
JIWP	Joint Interim Working Party
JLRS	Japan Ladies' Radio Society
JMFD	Joyn Moyle (Memorial National) Field Day
JOTA	Jamboree On The Air
KARL	Korean Amateur Radio League
KARS	Kuwait Amateur Radio Society
kB	Kilobyte
kHz	Kilohertz
KISS	Keep It Simple, Stupid!
LABRE	Liga de Amadores Brasileiros de Radio Emissao
LAN	Local Area Network
LAOCP	Limited Amateur Operator's Certificate of Proficiency
LARA	Ligos dos Amatores de Radio de Angola
LARS	Lesotho Amateur Radio Society
LASER	Light Amplification by Stimulated Emission of Radiation
LCD	Liquid Crystal Display
LCRA	Liga Colombiana de Radioaficionados
LED	Light Emitting Diode
LF	Low Frequency (30 to 300 kHz)
LFARG	Land Forces Amateur Radio Group
LHF	Left-Hand Side
LIU	Line Isolation Unit
LMRE	Liga Mexicana de Radio Experimentadores
LNA	Low-Noise Amplifier
LO	Local Oscillator
LOS	Loss of Satellite (or Signal)
LPRA	Liga Panamena de Radioaficionados
LRAA	Liberian Radio Amateurs' Association
LREM	Liga dos Radio Emissores de Mocambique
LSB	Lower Sideband
LSI	Large Scale Integration
LTA	Lighter Than Air
LW/AW	Light Weight Air Warning
mA (mV)	Milliampere (millivolt) etc
MAC	Multiplexed Analog Components (Satellite TV System)
MARL	Malta Amateur Radio League
MARS	Mauritius (or Monserrat) Amateur Radio Society Military Affiliated Radio Service
MARTS	Malaysian Amateur Radio Transmitters' Society
MASER	Microwave Amplification by Stimulated Emission of Radiation
MB	Megabyte
MCW	Modulated Continuous Wave
MDS	Minimum Detectable Signal Multipoint Distribution System
MF	Medium Frequency (300 kHz to 3 Mhz)
MHz	Megahertz
MMIC	Miniature Microwave Integrated Circuit
MODEM	Modulator-Demodulator
MODS	Modifications
MOS	Metal Oxide Silicon
MOSFET	Metal Oxide Silicon Field Effect Transistor
MOX	Manually Operated Changeover
MPRGI	Melbourne Packet Radio Group Inc
MRASZ	Magyar Radioamator Szovetseg (Hungary)
MS-DOS	Microsoft © Disk Operating System
MTBF	Mean Time Between Failures
MUF	Maximum Usable Frequency
NAND	Not And
NAOCP	Novice Amateur Operator's Certificate of Proficiency
NARS	Nigerian Amateur Radio Society
NASA	National Aeronautics & Space Administration
NASDA	National Space Development Agency (Japan)
NBFM	Narrow Band Frequency Modulation
NBS	National Bureau of Standards
NCDXF	Northern California DX Foundation
NCRG	Northern Corridor Radio Group (Perth)
NDB	Non-Directional Beacon
NEC	Nippon Electric Company
NERG	North East Radio Group (Melbourne)
NICAD	Nickel Cadmium (cell or battery)
NOAA	National Oceanic & Atmospheric Administration
NOC	Network Operations Centre
NORAD	North (American) Air Defence
NPO	Negative Positive Zero
NRRL	Norsk Radio Relae Liga (Norway)
NRZ	Non Return to Zero
NRZI	Non Return to Zero Inverted
NTSC	National Television Systems Committee
NZART	New Zealand Association of Radio Transmitters
NZRFS	New Zealand Radio Frequency Service
OM	Old Man
ORARI	Organisasi Radio Amatir Republik Indonesia
OSCAR	Orbital Satellite Carrying Amateur Radio
OTC	Overseas Telecommunications Commission Old Timers' Club
OTHR	Over The Horizon Radar
OVSV	Oesterreichischer Versuch-Sender-Verband (Austria)
PA	Power Amplifier Public Address
PABX	Private Automatic Branch Exchange
PACSAT	Packet (radio) Satellite
PAL	Phase Alternating Line (TV colour system)
PARA	Philippines Amateur Radio Association
PARS	Pakistan Amateur Radio Society
P(R)BBS	Packet (Radio) Bulletin Board Service (System)
PC	Printed Circuit Personal Computer
PCA	Point of Closese Approach
PCB	Printed Circuit Board Polychlorinated Biphenyl (toxic liquid insulator)
PEP	Peak Envelope Power
PET	Polyethylene Terephthalate (used for plastic bottles)
PIN	Positive-Intrinsic-Negative
PIR	Passive Infra Red
PLL	Phase-Locked Loop
PMB	Project Management & Budgeting
PNGARS	Papua New Guinea Amateur Radio Society
PSIG	Pounds (per) Square Inch (Gauge)
PSK	Phase Shift Keying
PTFE	Poly Tetra-Fluoro-Ethylene (Teflon is one trade-name)
PTT	Push to Talk Posts, Telegraph & Telephone
PVA	Poly-Vinyl Acetate (eg plastic paint)
PVC	Poly-Vinyl Chloride
PZK	Polski Zwiazek Krotkofalowoow (Poland)
QARDATA	Queensland Amateur Radio Digital And Teletype Association
QCWA	Quarter Century Wireless Association
QTHR	Location Correct in Call Book
RAAG	Radio Amateur Association of Greece
RAAN	Right Ascension of Ascending Node
RACES	Radio Amateur Civil Emergency Service
RADAR	Radio Detection And Ranging
RAL	Association des Radio Amateurs Libanais (Lebanon)
RAM	Random Access Memory
RAOTC	Radio Amateur Old Timers' Club
RAST	Radio Amateur Society of Thailand

RAX	Rural Autometric Exchange
RAYNET	Radio Amateur Emergency
RC	Radio Controlled Resistance Capacitance
RCA	Radio Club Argentino Radio Corporation of America
RCB	Radio Club Boliviano
RCC	Radio Club de Chile Rag Chewers' Club
RCCR	Radio Club de Costa Rica
RCD	Radio Club Dominicano
RCH	Radio Club of Haiti (also Honduras)
RCP	Radio Club Paraguayo (also Peruano)
RCU	Radio Club Uruguayo
RCV	Radio Club Venezolano
RD	Radio Detector Remembrance Day
RDSS	Radio Determination Satellite Service
RED	Reseau das Emetteurs Francais
REP	Rede dos Emissores Portugueses
RF	Radio Frequency
RFDS	Royal Flying Doctor Service
RFI	Radio Frequency Interference
RGB(I)	Red-Green-Blue (Intensity?)
RHS	Right-Hand Side
RI	Radio Inspector
RISC	Reduced Instruction Set Computer
RIT	Receiver Incremental Tuning
RJRAS	Royal Jordanian Radio Amateur Society
RL	Reseau Luxembourgeois (des Amateurs des Ondes Courtes)
RMS	Root Mean Square
RNARS	Royal Naval Amateur Radio Society
ROARS	Royal Omani Amateur Radio Society
ROM	Read Only Memory
RPM	Revolutions Per minute
RPN	Reverse Polish Notation
RSARS	Royal Signals Amateur Radio Society
RSB	Radio Society of Bermuda
RSF	Radio Sports Federation (of USSR)
RSGB	Radio Society of Great Britain
RSK	Radio Society of Kenya
RSL	Returned Servicemen's League
RSM	Resident System Monitor Regimental Sergeant Major
RSS	Radio Society of Swaziland
RSSL	Radio Society of Sri Lanka
RST	Readability, Strength, Tone
RSTG	Radio Society of The Gambia
RSZ	Radio Society of Zambia
RTTY	Radio Teletype
RUDAK	Regeneratische Uberantworter vor Digital Amateuradio Kommunicationsmittel?
RX	Receiver
SAA	Standards Association of Australia (now Standards Australia)
SADCG	Sydney Area Digital Communications Group
SAPS	Stand Alone Prediction Service
SARES	Soviet Amateur Radio Emergency Service
SAREX	ShuttleAmateur Radio Experiment
SARL	South African Radio League
SARTS	Singapore Amateur Radio Transmitting Society
SASE	Self-Addressed Stamped Envelope
SATVG	Sydney Amateur Television Group
SBSS	Sound Broadcasting Satellite Service
SCR	Silicon Controlled Rectifier
SEA	South East Asia
SECAM	Sequence a Memorie (French colour TV system)
SEG	Southern Electronics Group (Albany WA)
SELCALL	Selective Calling (system)
SEQATVG	South-East Queensland Amateur TV Group
SES	State Emergency Service
SHF	Super High Frequency (3 to 30 GHz)
SID	Sudden Ionospheric Disturbance Sound Interference Device
SINAD	Signal (ratio to) Noise and Distortion
SIRS	Seychelles (also Solomon) Islands Radio Society
SLARS	Sierra Leone Amateur Radio Society
SMA	Small Microwave Accessory?
SMD	Surface Mounting Device
SMIRK	Six-Metre International Radio Klub
SMIS	Spectrum Management Information System
SNA	System Network Architecture
SNAFU	Situation Normal, All Fouled Up!
SPARC	Southern Peninsula Amateur Radio Club
SPDT	Single Pole Double Throw
SPOT	Satellite Pour Observations Terrestrielles
SPST	Single Pole Single Throw
SRAL	Suomen Radioamatoorliitto (Finland)
SRJ	Saves Radio Amatera Jugoslavije
SSA	(Foreningen) Sveriges Sandareamatorer (Sweden)
SSB	Single Sideband
SSR	Secondary Surveillance Radar
SSTV	Slow Scan Television
STC	Standard Telephones & Cables
STD	Subscriber Trunk Dialling
SWL	Short Wave Listener
SWR	Standing Wave Ratio
SYELEDIS	Systeme Electronique pour Evaluation de Distance
SYSOP	System Operator
TAFE	Technical And Further Education
TAPR	Tucson Amateur Packet Radio
TARC	Townsville Amateur Radio Club
TCA	Time of Closest Approach
TCPIP	Transfer Control Peripheral Interchange Program
TEAC	Technical Equipment Advisory Committee
TEP	Trans Equatorial Propagation
TII	Turn Indicator Interference
TIR	Technical Institute of Radio (Syria)
TLC	Tender Loving Care
TLM	Telemetry
TNC	Terminal Node Controller Tiny N Connector
TPC	Third Party Traffic
TRAC	Telsiz Radyo Amatorleri Cemiyeti (Turkey
TRF	Tuned Radio Frequency
TTARS	Trinidad & Tobago Amateur Radio Society
TTL	Transistor Transistor Logic
TTY	Teletype
TU	Terminal Unit Thank You
TV	Television
TVI	Television Interference
TX	Transmitter
UART	Universal Asynchronous Receiver Transmitter
UBA	Unie van de Belgische Amateur-Zenders (Belgium)
UHF	Ultra High Frequency (300 MHz to 3 GHz)
ULA	Uncommitted Logic Array
UoSAT	University of Surrey Satellite
URA	Unio de Radioallcionats Andorrans
URE	Union de Radioaficionados Espafioles
USB	Upper Sideband
USKA	Union Schweizerischen Kurzwellen-Amateure
UTC	Universal Temps Co-ordiné (formerly GMT)
UV	Ultra-Violet
UZRA	Union Zairoise des Radio Amateurs
VARS	Vanuatu Amateur Radio Society
VBT	Variable Bandwidth Tuning
VCO	Voltage Controlled Oscilator
VCR	Video Cassette Recorder
VDE	Verein Deutsche Elektrotechniker (German standard society)
VDU	Visual Display Unit
VERON	Vereenlging voor Experimenteel Radio Onderzoek In Nederland
VFO	Variable Frequency Oscillator
VGA	Video Graphics Adapter
VHF	Very High Frequency (30 to 300 MHz)
VHS	Video Home System
VIC	Video Interference Controller
VLF	Very Low Frequency (3 to 30 kHz)
VLSI	Very Large Scale Integration
VOA	Voice Of America
VOX	Voice Operated Changeover
VRAS	Vereenlging van Radio Amateurs in Suriname
VSB	Vestigial Sideband
VSWR	Voltage Standing Wave Ratio
VTAC	Victorian Technical Advisory Committee
VTVM	Vacuum Tube Volt Meter
VU	Volume Unit
VXO	Variable Crystal Oscillator
WAADCA	Western Australian Amateur Digital Communication Association
WANSARC	Western And Northern Suburbs Amateur Radio Club
WARC	World Administrative Radio Conference
	Westlakes Amateur Radio Club
WARG	Wagga Amateur Radio Group
WARO	Women's Amateur Radio Organisation (NZ)
WAS	Worked All States
WAVKCA	Worked All VK Call Areas
WAZ	Worked all Zones
WEFAX	Weather Facsimile
WIA	Wireless Institute of Australia
WIAGSA	WIA Grid Square Award
WICEN	Wireless Institute Civil Emergency Network
WOD	Whole Orbit Data
WPM	Words Per Minute
WPX	World Prefix (Contest)
WSARC	Western Samoa Amateur Radio Club
WWSA	World-Wide South America (Contest)
XIT	Transmitter Incremental Tuning
XMTR	Transmitter
XYL	Ex Young Lady (le wife)
YL	Young Lady
YLRL	Young Ladies' Radio League
ZARS	Zimbabwe Amateur Radio Society
ZIF	Zero Insertion Force (applies to connectors)

Have you advised the DoTC of your new address?

AWARDS

PHILL HARDSTAFF VK3JFE – FEDERAL AWARDS MANAGER
PO BOX 300 SOUTHCAULFIELD VIC 3162

It's been a year now since we had a general listing of all the awards available from the WIA. As this is the Annual Data Issue I have decided to list all of the WIA awards currently available. Because of the number of letters I have had requesting no QSLs, and as a number of other reputable organisations have taken this path (eg NZART), I would like to make it so that you do not need QSL cards for any WIA award except DXCC. In case you think this is some super radical change to the rules — it is not. If you read the full rules for all awards as printed in the 1986 Callbook, you will find that QSL cards were never required for VK applicants for WAVKCA. All I am trying to do here is standardise the rules, and bring them in line with what people want. Personally, I can't see the need for stipulating that QSL cards be required, as if you want to cheat on an award application, well, that's your problem, and you will always know that the piece of paper hanging on the wall is a permanent reminder of that fact (that you are a cheat), and you will never really be as proud of it as someone who earned theirs properly — will you? Also, with the price of postage these days, QSLing can be very expensive, and not everyone likes to QSL anyway. I don't think we can really have no QSLs for DXCC. Please don't get this confused with not having to send QSL cards to me for DXCC. You need to have QSL cards for DXCC, but do not need to send them to the awards manager, a certified list is OK. In the meantime, QSLs will still be required until I consult with the Federal Executive on how to go about dropping this from the rules.

WIA Awards Program General Rules

Cost: Free to all WIA members, VK non-members pay $A5 and others $US5 or eight IRCs.

Verifications: Applicants need to hold QSL cards for QSOs claimed. However, do not send QSL cards with your application. A list of all contacts is needed which should list the following information: Date, time, callsign of station contacted, frequency, mode. Contacts should be listed in order of callsigns. At the bottom of this list should be a declaration signed by an official of a recognised society or by two licensed amateurs reading as follows, "I/we certify that (insert name and callsign of applicant) holds QSL cards corresponding to the above list and that I/we have personally inspected these cards." Signatories to the declaration should clearly indicate their names and callsigns.

Six Metres: Contacts on 50MHz during the period that we were not allowed to operate below 52MHz will not be allowed. This goes for DX stations claiming contacts with illegal VK stations as well. I feel very strongly about this, otherwise it will undermine the whole honesty system.

Applications

- Applicants should state whether they are WIA members and, if so, list their membership number. Where relevant, changes in callsigns and dates of such changes should be indicated.
- All contacts for any particular award should be made from the same call area.
- Crossband contacts are not eligible nor are those made through terrestrial repeaters, from aircraft or to or from seagoing vessels.
- Where a fee is payable this should be sent with the application.
- In case of dispute, the decision of the Federal Awards Manager and two officers of the Federal Executive on the interpretation of these rules shall be final and binding.

Awards Available

WIA DXCC Award

This award is available to all amateurs who submit evidence of having worked 100 countries, and can be endorsed for various bands and modes. Acceptable countries are those that are acceptable for ARRL DXCC (I will print an up-to-date country list soon), with the WIA reserving the right to make different decisions in regard to additions and deletions.

Having obtained the DXCC award, holders may register subsequent claims for higher totals, and these will be published from time to time in *Amateur Radio* magazine in the form of a ladder. No stickers to indicate these higher levels on certificates are available (I'm working on this one). Applications for higher totals should be made in multiples of 25 up to a total of 200 (ie 125, 150, 175, 200) and thereafter in multiples of 10 up to a total of 300. After 300 applications will be processed in one-country steps or as required.

Should a country be deleted from the DXCC list, credit for that country will be allowed if worked before the date of deletion. The DXCC ladder will show the members' tally of current countries and total of current plus deleted countries, eg 200/220 — meaning 200 current countries and an extra 20 that have been deleted at some time, but were worked before the date of deletion.

All claimed QSOs must be made from the same DXCC country.

General rules apply.

Worked All VK Call Areas

Known as WAVKCA, this colourful (now A4 sized) certificate is the WIA's most popular award. There are *separate* requirements for local and overseas amateurs.

VK applicants require 77 QSOs as follows:

- VK0 — three contacts from at least two different areas
- VK1 — three contacts on at least two different bands
- VK2,3,4,5,6 and 7 — 10 contacts from each call area on at least three different bands
- VK8 — three contacts on at least two different bands
- VK9 — four contacts from at least three different areas.

General rules apply except Australian applicants need not hold QSL cards.

No repeat contacts made after 14 February 1990 will count.

DX applicants (non-VK) require 22 QSOs as follows:

- VK0, 1 — one contact from each call area
- VK2,3,4,5,6 and 7 — three contacts from each call area
- VK8,9 — one contact from each call area.

Contacts must be after 1 January 1946.

General rules apply.

Heard All VK Call Areas

This is a "heard only" version of WAVKCA award, available to SWLs on the same basis as to amateurs; the same fees and procedures apply.

General rules apply.

Worked All VK Call Areas (VHF) Award

Requires 22 QSOs on VHF bands (50MHz and above) as follows:

- VK0, 1 — one contact each
- VK2, 3, 4, 5, 6 and 7 — three contacts from each
- VK8, 9 — one contact each

Contacts must have been made after 1 January 1958.

If the applicant moves to a new location and the new location exceeds a distance of 240km from the old, a new application will be necessary for the new QTH.

General rules apply.

Worked All States (VHF) Award

Requires eight QSOs on VHF bands (50MHz and above) as follows:

One contact each with each state and territory of Australia as listed below:

- VK1 — Australian Capital Territory
- VK2 — New South Wales
- VK3 — Victoria

— VK4 — Queensland
— VK5 — South Australia
— VK6 — Western Australia
— VK7 — Tasmania
— VK8 — Northern Territory

General rules apply.

Australian VHF Century Club Award

Requires 100 QSOs on VHF bands (50MHz and above) as follows:

— 100 contacts with 100 different stations at least 70 of which must be Australian.
— Separate awards will be issued for each different VHF/UHF band.
— Contacts must be on or after 1 June 1948.

If the applicant moves to a new location and the new location exceeds a distance of 240km from the old, a new application will be necessary for the new QTH.

General rules apply.

WIA Antarctic Award

Applicants need to make 10 confirmed contacts with amateur stations conducting valid operations from Antarctica. The 10 must include stations licensed by at least six different government authorities, and at least one must be a VK0.

Antarctica is defined as the land mass, including islands and permanent ice shelf below 60 degrees south latitude. (This excludes Heard and Macquarie Islands. These are sub-Antarctic).

Only contacts on or after 23 February 1988 are valid for this award.

General rules apply.

Note: I am still trying to piece together just how far Ken got with this one. From what I can tell, no certificates have been produced but one may have been designed. If anyone out there has any information on this award please let me know. To date there have been only three applications.

Worked All Continents

This award is sponsored by the International Amateur Radio Union, International Secretariat (at ARRL HQ) and is available only to amateurs who are members of their IARU-affiliated national society which, in Australia, is the WIA. So, to put it bluntly, if you are *not a WIA member* then you cannot apply for this award (for a VK callsign). There cannot and will not be any exceptions to this. If you do care to send an application direct, it will be returned and you will be told to apply to the WIA.

The basic award is free and is available for one contact with each of the six continents, ie North America, South America, Oceania, Asia, Europe and Africa. You can apply for any of the following certificates:

— Basic certificates (mixed modes)
— CW
— Phone
— SSTV
— RTTY
— FAX
— Satellite
— 5-Band

as well, the following endorsement stickers are available:

— 6-Band
— QRP (5 watts out or less)
— 1.8MHz
— 3.5MHz
— 50MHz
— 144MHz
— 430MHz

I do need to see QSL cards (not photocopies) so please include a self-addressed envelope the same size as that in which you send the cards to me, and also with the same amount of postage on it, and I will turn your cards around quickly. No other fees or IRCs are necessary, but if you could include an address label out of an *AR* magazine to prove membership this would be helpful.

Worked All States

You may have noticed that I referred to the Worked All States Award before as WAS VHF. This is because I intend to introduce a HF version of this award, as I think it would be popular and fairly simple to qualify for. Some of these simple awards can be quite rewarding, especially when they represent working all the states or similar of a country. One award I have which I quite like is the ZL Worked All Districts award, which is available on all bands, not just VHF. Even though it is only for working the four districts, it is a nice one to get. The HF version will be a different design as we have a large number of the VHF awards, and at the current rate these will last a long time.

News of some other awards

Royal Omani Amateur Radio Society

I received a letter from Salim Al-Kitani (A41JV) giving details of an award for working a maritime mobile station using the call-sign of A43SR/M operating on all bands from 3.5MHz to 28MHz on board the Omani yacht "FULK AL-SALAMAH". The yacht will be mobile from 13/10/1990 to 31/3/91, so you will still have a month or so to catch up with it. You need to work the above station on either two different bands or two different modes to qualify for the award. All QSL and award claims to ROARS, Box 981, Muscat, Sultanate of Oman. You should send a certified log extract and 10 IRCs or equivalent.

Maple Leaf Award

I received rules to the above award from its custodian Gary Hammond VE3GCO:

1. Work and confirm different prefixes (NOT JUST STATIONS) from Canada. There are six classes to the award.
— Class IV requires 10 Canadian prefixes
— Class III requires 15 Canadian prefixes
— Class II requires 25 Canadian prefixes
— Class I requires 30 Canadian prefixes
— Maple Leaf Award 50 Plaque requires 50 different prefixes
— Maple Leaf Award 100 Walnut Plaque requires 100 different prefixes
2. The cost of the attractive red and white flag certificate is $3 or seven IRCs. All contacts must be after 15 February 1965, the date which Canada received its official flag. Send log data only, or complete the lower prefix table with the call suffix. The MLA 50 plaque is a wood-grain plaque with a metallic copper crest, cast maple leaves and beautifully engraved plaque. The MLA 100 plaque walnut plaque is a larger one of similar design. The MLA 50 costs $US40 for DX applicants and the MLA 100 costs $US50 for DX applicants, which includes air-mail costs.
3. The sponsor is the Maple Leaf Radio Society VE3GCO, C/o Gary V Hammond, 5 McLaren Avenue, Listowel, Ontario, Canada, N4W 3K1.

Prefix Table

CF1	2	3	4	5	6	7	8	9	0	CF
CG1	2	3	4	5	6	7	8	9	0	CG
CH1	2	3	4	5	6	7	8	9	0	CH
CI1	2	3	4	5	6	7	8	9	0	CI
CJ1	2	3	4	5	6	7	8	9	0	CJ
CK1	2	3	4	5	6	7	8	9	0	CK
CY1	2	3	4	5	6	7	8	9	0	CY
CZ1	2	3	4	5	6	7	8	9	0	CZ
VA1	2	3	4	5	6	7	8	9	0	VA
VB1	2	3	4	5	6	7	8	9	0	VB
VC1	2	3	4	5	6	7	8	9	0	VC
VD1	2	3	4	5	6	7	8	9	0	VD
VE1	2	3	4	5	6	7	8	9	0	VE
VF1	2	3	4	5	6	7	8	9	0	VF
VG1	2	3	4	5	6	7	8	9	0	VG
VO1	2	3	4	5	6	7	8	9	0	VO
VX1	2	3	4	5	6	7	8	9	0	VX
VY1	2	3	4	5	6	7	8	9	0	VY
XJ1	2	3	4	5	6	7	8	9	0	XJ
XK1	2	3	4	5	6	7	8	9	0	XK
XL1	2	3	4	5	6	7	8	9	0	XL
XM1	2	3	4	5	6	7	8	9	0	XM
XN1	2	3	4	5	6	7	8	9	0	XN
XN2	2	3	4	5	6	7	8	9	0	XN
XO1	2	3	4	5	6	7	8	9	0	XO
Special prefixes Centennial prefixes from 1967										
3B1	2	3B								
3C1	2	3	4	5	6	7	8	0	3C	

4. From 15 February to 15 April 1990 VE3XN operated the special 25th anniversary call CF25A. If other double or triple numbers/numeral calls are allowed in the future each will count separately as per the rules of CQ WPX award. Good luck.

Grid Square Award

At this stage I just wish to say that I have not forgotten about the Grid Square Award, and that I am just putting the finishing touches to the rules, so this is your last chance to have a say. The draft rules appeared in the October 1990 issue of *AR*. I wish to acknowledge letters from VK3BRZ, VK3KKW, VK3ZJC, VK2EMU, ZL3TX/VK4AEZ and a phone call from VK3EBP. Thank you for your comments and suggestions, most of which will be incorporated in the new draft rules which will *definitely* be in next month's issue. As I am on holidays for a couple of weeks, I am trying to get on top of things, but I have already spent five days trying to catch up on awards etc, but still have a long way to go. I seem to be getting a lot more mail lately. This seems to be related to sending a current list of available awards with every award I send out.

That's about it for this month — happy hunting.

73 de Phill VK3JFE/FK1TS

CONTESTS

NEIL PENFOLD VK6NE
CONTESTS CO-ORDINATOR

Commonwealth Contest 1991 Rules

An appeal is made to the many very competent CW operators licensed in recent years to help bolster VK participation in the Commonwealth Contest this year.

In 1990, 30 logs were submitted, but 50-60 (as evidenced by the logs) had contest exchanges, some of the "non-entrants" having quite large contact totals which would have translated to substantial scores.

The contest is a unique combination of a domestic and a DX contest and it would be theoretically possible to score 3000 points (but hardly likely!) from VK contacts only.

Rules

(Reprinted from RadCom)

1. General: The Commonwealth Contest is intended to promote contacts between stations in the British Commonwealth and Mandated Territories.

2. Eligible entrants: British Isles — Class A licence holders, who must be members of RSGB. **Overseas** — Licensed radio amateurs within the British Commonwealth or British Mandated Territories. Single-operator entries only will be accepted, and entrants may not receive any assistance whatsoever during the contest, including the use of spotting nets or other assistance in finding new bonuses. Entries will not be accepted from headquarters stations, nor from stations using GB or other special-event callsigns or operating maritime or aeronautical mobile.

3. When: 1200GMT Saturday, 9 March 1991 to 1200GMT Sunday, 10 March 1991.

4. Sections: (a) multi-band
(b) single-band

Single-band entrants should claim points for contacts made on one band only, but are requested to submit details of QSOs made on other bands, for adjudication purposes. Multi-band entries will not be eligible for single-band awards.

5. Frequencies/mode: CW only in the 3.5, 7, 14, 21 & 28MHz bands. Entrants should operate in the lower 30kHz of each band, except when contacting novice stations operating above 21030 and 28030kHz. Crossband contacts will not count for points or bonuses.

6. Contest Exchange: RST and serial number, commencing with 001.

7. Scoring: Contacts may be made for points with any station using a British Commonwealth prefix (see accompanying list) except those within the entrant's own call area. Note that for this contest the entire UK counts as ONE call area, and therefore UK stations may not work each other for points. Each completed contact scores five points, with a bonus of 20 points for each of the first three contacts with each Commonwealth Call Area, on each band.

8. 'Headquarters' Stations: A number of Commonwealth Society HQ stations (although not eligible as entrants) are expected to be active during the contest and will send 'HQ' after their serial number to identify themselves. Every HQ station counts as an additional call area (and therefore attracts the 20-point bonus) and entrants may contact their own HQ station for points and bonuses.

9. Logs: Separate logs are required for each band. Entries should be typed or written in ink on one side only of standard (A4) size paper or pre-printed log sheets, and should contain 40 QSOs per page. Columns to be headed: Time GMT; callsign of station worked; RST and serial number sent; RST and serial number received; bonus points; points claimed. Computer-generated logs are welcomed provided they are formatted as above.

Duplicate contacts must be clearly marked and not claimed for points. Each unmarked duplicate contact found for which points have been claimed will result in the deduction of 55 points. Entries containing more than five such duplicates will be liable to disqualification.

Each entry must be accompanied by a cover sheet indicating the section entered and the scores claimed on each band (also, don't forget details of equipment, and your correspondence address!). Entrants making more than 80 QSOs are requested to include a check-list of the callsigns appearing in the log, sorted into alphabetical order and with either the serial number sent or the time of contact beside the callsign.

10. Declaration: Each entry must be accompanied by the following declaration, signed and dated: "I declare that this station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decision of the Council of the RSGB will be final in all cases of dispute."

11. Address for logs: RSGB HF Contests Committee, PO Box 73, Lichfield, Staffs, WS13 6UJ, England.

12. Closing date for logs: Logs should be posted to ARRIVE before 8 April 1991. Overseas entrants are advised to forward their logs by air mail, as late entries may be treated as checklogs.

13. Awards:

(a) Multi-band — The Senior Rose Bowl will be awarded to the overall leader, and the runner-up will be awarded the Junior Rose Bowl. The Col Thomas Rose Bowl will be awarded to the highest-placed UK station. Certificates of Merit will be awarded to the third-placed entrant overall, and to the leading station in each call area.

(b) Single-band — Certificates of Merit will be awarded to the leading overseas and UK entrants on each band.

Receiving Contest

A Receiving Contest is run in conjunction with the above.

For rules, SASE to VK3ZC QTHR.

Commonwealth Contest 1991 Call Areas

The following call areas are recognised for the purpose of scoring in the Commonwealth Contest 1991:

A2	Botswana
A3	Kingdom of Tonga
AP	Pakistan
C2	Nauru
C5	Gambia
C6	Bahamas
G,GB,GD,GI,	United Kingdom
GJ,GM,GU,GW	(all one area)
H4	Solomon Is
J3	Grenada
J6	St Lucia
J7	Dominica
J8	St Vincent
P2	Papua New Guinea
S7	Seychelles
T2	Tuvalu
T20	W Kiribati

T31	C Kiribati
T32	E Kiribati
V2	Antigua, Barbuda
V3	Belize
V8	Brunei
VE1	Maritime Provinces
VE1	Sable Is
VE1	St Paul Is
VE2	Quebec
VE3	Ontario
VE4	Manitoba
VE5	Saskatchewan
VE6	Alberta
VE7	British Columbia
VE8	North West Territories
VK1	Australian Capital Territory
VK2	New South Wales
VK3	Victoria
VK4	Queensland
VK5	South Australia
VK6	Western Australia
VK7	Tasmania
VK8	Northern Territory
VK9L	Lord Howe Is
VK9M	Mellish Reef
VK9N	Norfolk Is
VK9X	Christmas Is
VK9Y	Cocos (Keeling) Is
VK9Z	Willis Is
VK0	Heard Is
VK0	Macquarie Is
VK0	Antarctica
VO1	Newfoundland
VO2	Labrador
VP23E	Anguilla
VP2K	St Kitts, Nevis
VP2M	Montserrat
VP2V	British Virgin Is
VP5	Turks & Caicos
VP8	Falkland Is
VP8	S Georgia
VP8	S Sandwich Is
VP8	S Shelland Is
VP8	Antarctica
VP9	Bermuda
VQ9	Chagos
VR6	Pitcairn Is
VS6	Hong Kong
VY1	Yukon
VU	India
VU7	Laccadives
VU7	Andaman & Nicobar Is
YJ	Vanuatu
Z2	Zimbabwe
ZB2	Gibraltar
ZC4	Cyprus (Sovereign 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	New Zealand
ZL1	New Zealand
ZL2	New Zealand
ZL3	New Zealand
ZL4	New Zealand
ZL5	Antarctica
ZL7	Chatham Is
ZL8	Kermadec Is
ZL9	Auckland & Campbell Is
3B8	Mauritius
3B9	Rodriguez Is
3D2	Fiji
3DA	Swaziland
4S	Sri Lanka
5B4	Cyprus
5H	Tanzania
5N	Nigeria
5W	Western 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
9M6/9MB	E Malaysia
9V	Singapore
9Y	Trinidad & Tobago
GB5CC	RSGB HQ Station + various other Commonwealth HQ stations

Commonwealth Contest 1990 Results

Not all VKs would have considered the conditions for the 1990 Commonwealth Contest as ideal, but they were a great improvement on the previous year when QRN on the lower bands really made things difficult.

Though the number of local logs submitted dropped from 36 to 30, there was a quite reasonable number of VKs available for contact on the bands, estimated to be in the mid-50s.

It is one thing to participate and, at the end of the contest, to tot up the score — by the time the results come out you will have forgotten your score — so how much better is it to send in an entry and see in print where you came in relation to those whom you contacted?

We recall, some 15 years ago, a prominent VK6, an overall winner in his day, reportedly being asked why he no longer took part in BERU, as it was then. Apparently there was no challenge left as "anyone could win it from WA"!

No sour grapes, but the West does seem to be in a unique position in this contest compared with the east coast, as it gets openings especially on 15 and 10 which don't seem to appear elsewhere. Of course, you have to be pretty smart too, to grasp the opportunity!

Kevin Smith VK6LW came to the fore again to take out fourth place with a fine score of 6190, which seems to be the first ever over 6000 from a VK. Russ Coleston VK4XA, 4785, was eighth, and Dieter Kiesewetter VK2APK, 12th with 4410.

Al Slater G3FXB decided to try his hand at DXpeditioning, and as ZC4ESB was the overall winner by 165 from VE7CC. Conditions in the UK must have been good as four Gs made the top 10.

For the first time, Australia was represented by a HQ station, VK3WIA, eligible for contact and bonus points, but not for competition. The operating was shared, thanks to Tino Pavic VK3EGN and Roy Reed VK3ELB who between them netted 261 contacts.

ZL never seems able these days to produce more than five entries. The VEs improved to 21, while there was keen competition between 9J2, P29, 5Z4, C56, ZB2, Z23, V2, VO, VU and 6Y5.

A new development was an entry from VE3/W8VSK/M — the call is undoubtedly a Commonwealth one!

Scores — Top Ten

Posn	Call	Total	80	40	20	15	10
1	ZC4ESB	6755	240	755	2250	2065	1445
2	VE7CC	6590	428	1213	1982	1697	1270
3	6Y5HN	6225	425	1215	2220	1495	870
4	VK6LW	6190	325	1050	2045	1705	1065
5	G4BUO	5352	420	910	1470	1592	960
6	G3MXJ	5145	410	750	1671	1354	960
7	G3LET	5117	360	974	1543	1385	855
8	ZL3GQ	4809	579	950	1390	1310	580
9	VK4XA	4785	425	770	1730	1120	740
10	G3OZF	4500	325	690	1345	1350	790

Australian Scores

4	VK6LW	6190	325	1050	2045	1705	1065
10	VK4XA	4785	425	770	1730	1120	740
12	VK3APK	4410	350	865	1575	965	655
23	VK2AYD	3327	350	780	1305	625	267
27	VK3ZC	2905	525	830	810	515	225
29	VK5GZ	2870	405	300	1135	760	270
31	VK5BN	2790	300	575	860	630	425
41	VK2DID	2470	300	810	810	525	25
43	VK3DQ	2400	500	525	840	435	100
47	VK6RU	2350	-	100	930	695	625
48	VK4XW	2315	380	550	905	380	100
50	VK6HQ	2183	-	-	1243	865	75
57	VK8HA	2025	-	-	1025	810	190
61	VK6AJ	1880	-	-	1880	-	-
67	VK5AGX	1675	-	-	1675	-	-
70	VK3MJ	1655	-	200	875	505	75
71	VK2EL	1605	175	325	675	405	25
77	VK4TT	1480	-	-	1480	-	-
79	VK7RY	1405	300	235	645	150	75
81	VK3DNC	1365	-	250	680	335	100
86	VK4OD	1218	350	460	408	-	-
87	VK3XB	1195	-	-	-	1195	-
91	VK3JI	1078	-	-	1078	-	-
92	VK3KS	1060	-	-	285	775	-
93	VK2AIC	1030	-	125	530	245	130
94	VK5HO	975	225	175	475	75	25
98	VK3XF	880	200	275	405	-	-
102	VK3FC	823	-	823	-	-	-
103	VK5RG	820	-	75	520	225	-
107	VK3BDH	730	-	-	430	200	100

Single-band entries among the above were:

7MHz	VK3FC
14MHz	VK6AJ equal overseas leader, VK3JI, VK4TT, VK5AGX..
21MHz	VK3XB

Other Pacific area results:

8	ZL3GQ	4809	45	P29PL	2385
16	ZM1AIZ	4140	80	ZL1AZE	1400
26	ZM1HV	3021	112	ZL3BJ	550

RSGB Comments (reproduced from RadCom Nov '90)

Well, the case is proven, CW DXers are certainly not extinct! The 53rd Commonwealth

Contest was a great success with all those who took part and, once again, entries were up on last year (130 vs 128) in spite of severe QRM from a contest organised by a Japanese radio magazine and the usual crop of last-minute equipment failures. Your adjudicator was particularly pleased with the increased numbers of typed and carefully rewritten logs — thank you.

Having failed to meet his past ambition of an outright win from the UK, Al Slater G3FXB resorted to mounting a DXpedition this year. He put in an excellent winning log from ZC4ESB, using a TH3, long-wire and TS830. Al wins the Senior Rose Bowl for his efforts, and my thanks for his assistance with contest publicity (along with VK3ZC, ZL3GQ, ZL1AAS and other willing assistants worldwide). Lee Sawkins V37CC, using no less than seven beams, including a two-element Delta on 80m, had to settle for second place and the Junior Rose Bowl — a very creditable performance nevertheless, scoring around 900 points more than last year. Third place went to Nigel Hoyow 6Y5HN who could not quite match last year's score.

In the UK, Dave Lawley G4BUO took advantage of G3FXB's absence to win the Col Thomas Rose Bowl — though in fact his score would have exceeded Al's 1989 effort, so he was clearly in good form. Entries from Dennis Andrews G3MXJ, using a TH6 and slopers, and Peter Hobbs G3LET, using a ground plane and long wire, were closely matched for second and third UK places. Comparing the leader's stations demonstrates that operator skill and luck are of major importance — in other words, entrants without the resources to erect large aerial arrays need not be discouraged but should try even harder to maintain impetus throughout the 24 hours.

Single-band winners were: VO1NA (80m), ZL1AZE and G3DYY (40m), VK6AJ and G4BVH (20m), ZB2EO and G4BKI (15m) and VE3HX and G3PJT (10m). Certificates of merit go to each of them.

In the receiving section, "Brad" Bradbury BRS1066 was the lone entrant. His log was faultless and should serve as an example to other SWLs — indeed the HF Contests Committee would be more than happy to assist other listeners to enter (please write to the HFCC at RSGB HQ for more information). Brad wins the Receiving Rose Bowl.

A fair sprinkling of exotic DX was active, though of course never enough to satisfy everybody, and it was gratifying to see participation from Africa, the Pacific, Caribbean and India. Local conditions were generally difficult, and all credit to the operators for doing so well with often relatively modest stations. Nineteen-ninety was the first year that additional bonus points were available for working Commonwealth society HQ stations; a total of nearly 900 contacts were made with VK3WIA, ZL6A and GB5CC. We hope that further society stations will be active next year in the spirit of international friendship which is at the root of this contest, and once again we urge all Commonwealth amateurs to publicise the event on-air and in print wherever possible.

Comments received: "An enjoyable holiday" (G3FXB); "My logging program thrice lost about 10 QSOs" (ZL3G1); "A hard slog on Sunday morning" (G4BUO); "Capital fun" (VE2KN); "Best CW event of the year" (G3JJG); "Antennas damaged in ice storm three weeks before contest" (VE6OU/3); "Had 200mm of rain" (P29PL); "HF condx disappointing on Sunday morning, LF condx dismal" (GW4XXF et al); "Didn't intend to participate but got carried away" (VE1AYY); "Called CQ BERU to avoid JA QRM"; (GW3SB et al); "Thank goodness for liquid paper!" (VK6AJ).

G4IFB

ar

HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

The present propagation pattern in our part of the world is a worry for the VK/ZL DXing fraternity. Whilst the North American DX bulletins are praising the "very good and excellent propagation on most bands" we in VK and probably in ZL cannot say the same.

The best way to describe our propagation is "mediocre to very poor". Some DX nets did not operate at all during December, or survived on a very restricted basis, the participants being mainly the locals. Contrary to propagation predictions band openings on 14 MHz were very much later and shorter as expected. The solar flux numbers are constantly changing, but a slow downward pattern can be detected from time to time. Experts predict that the decay of Cycle 22 will start late 1992 and by 1997-97 it will be at its lowest point, after a spectacular start in September 1986.

Chatham Islands - ZL7

As predicted, (see Jan 91 AR) Eli HA9RE ZL0AAD/ZL7 and Miki ZL0ADN/ZL7 have appeared on the bands on December. They were heard on all bands from 28 MHz to 3.9 MHz. I had a QSO with Miki and I found out the following info about their operation. They will stay on Chatham until 13 January, then they will spend one week in ZL. Then they are off to Niue as ZK2XA and ZK2XB. Miki says they do not have an amplifier and their signal sometimes is lost in the pile-ups. As at 28 December they made approximately 2800 QSOs. A further problem is, that Miki ZL0ADN/ZL7 broke his right hand shortly before departure from Hungary. The hand is in plaster and it is very difficult to operate CW with it. They have a mini beam and several dipole antennas, which they share and use on alternate days. QSL goes to: DJ1ND, Klaus Dittmar, Huehlweg 45, D-8580, Bayreuth, Germany, with self-addressed reply envelope and 2 IRCs or one green stamp.

Afghanistan - YA

It was reported at the beginning of December that Romeo Stepanenko UB5JRR/3W3RR will go to Spratly Island for a second operation. However, this plan has been changed as Romeo received permission to operate from Afghanistan. This was scheduled to start before Christmas, but it was delayed on account of organizing enough funds, until early January 1991. The permission is for a three months operational period; however at this stage it is not known exactly how long he will stay. It is said that it will be only for three weeks.

Romeo will use the callsign YA0RR in Afghanistan. On the other hand, the well known French DXer, Jackie, F2CW received a six-months job transfer to Afghanistan, and will try to obtain a licence to operate.

Fiji - 3Ds

Eric 3D2EA, the well known DXer who for the past one year or more, was present almost daily on the ANZA net, has left Fiji with his family including a brand new daughter. Eric's contract has expired and he returned to Sydney on a temporary basis. He is expected to be heard shortly from Africa. Rumour has it, that it will be 5H3.

The Colvins

Lloyd, W6KG and Iris W6QL were active from Walvis Bay, as ZS9/W6KG and they hope to be operational shortly from Burundi, 9U, as the next stop of their travel through Africa. There are three resident operators in Walvis Bay. The Colvins C9QL activity from Mozambique has been approved by the ARRL DXCC Section. They made 5000 QSOs as C9QL. QSL goes to YASME (See Dec 90 AR.)

Madagascar - 5R8

Jim VK9NS reported early in December that IK2GNW Adriano will be active from this island state in the near future. The photocopy of Adriano's Madagascar licence was sighted by Jim, and the ARRL has approved the operations for the DXCC. The activity started around Christmas and ended on 4 January. Adriano 5R8GN was most cooperative with net activities, and quite a number of VKs were

able to work this rare country. QSL to Adriano's home address: Adriano Premoselli, Via Rossini 2, I-20080, Cisliano, Italy.

Saint Peter and Saint Paul Rocks - PY0S

The Brazilian Natal Dx Group, with a membership of 17, in a press release dated August 1990, announced a new DXpedition to these rocky outposts of Brazilian Territory in the Atlantic Ocean. The activity will take place in May 1991. They intend to activate PY0S with five operators for 10 days. This is the same DX group which activated Trindade Island for a very short time early in 1990. Let's hope their PY0S operation will be more successful than the one from PY0T.

San Felix - XQ0

John XQ0X is now active on this QTH. The beam antenna has been erected. This should help with contacts. John has limited knowledge of English and operates on lists with non-Spanish speaking amateurs. Mickey, CE3ESS is the list controller. John will stay on the island several months, so there is a good opportunity to work him. QSL to: (See Jan 1991 AR.)

Guinea-Bissau - J5

The QSL manager for Alfredo J5CVF advises that Alfredo (home call CT1CVC) will return to Guinea-Bissau on 5 January 1991, and will be active until the end of March. VK/ZL DXers are advised to check into the 14222 net on weekends. In February during one weekend, Alfredo will be active from the BIJAGOS ARCHIPELAGO, IOTA- AF-20. QSL for all operations will go to: CT1DIZ, Jose Alexandre C. Barbosa, Rua Serra Baixo 66, Algueirao, P-2725 Mem Martins, or Box 115, Algueirao, Portugal.

Interesting QSO's and QSL information

Note: callsign, name, frequency, mode, UTC, month of QSO. ADAR= QSL info in previous issues of A.R.

HV3SJ - 14019 - CW - 0630 - Dec - QSL to: I0DUD Guiseppe D'Aurelio, via Antonio Fogazaro 87, I-00137, Roma, Italy.

XZ2MR(?) - 21012 - CW - 0445 - Dec - in Rangoon (?) QSL to: F6FNU (?) ADAR,

ZS9/W6KG-LLOYD - 14005 - cw - 0600 - Dec - QSL to YASME: PO Box 2025, Castro Valley, Calif, 94546, USA.

T77C - 14021 - CW - 0640 - Dec - QSL to: Tony Ceccoli, Via Della Carrare, RSM, 47031 San Marino.

OA3AWE - TED - 21022 - CW - 0913 - Nov - QSL: via Bureau or direct.

WP4U - Carlos - 21295 - SSB - 0454 - Oct - QSL to: Carlos M. Colon, B-35, 2nd St, Jard - Caparra Bayamon, PR-00619, USA.

D68GA - Vance - 21223 - SSB - 0415 - Oct - QSL to: N6ZV: Don EJones, PO Box 3631, Glendale, CA - 91901 USA.

CT3DZ - Jose - 14192 - SSB - 0828 - Nov - QSL to: Jose Antonio Faria, Sitio Ariero, P-9000, Funchal, Madeira, Portugal.

KL7RA - Richard - 21237 - SSB - 0600 - Oct - QSL to: Richard A Strand, PO Box 60022, Fairbanks AK 99706, USA.

9N1HMB - 21237 - SSB - 1010 - Dec - QSL to: JA6CBG: via Bureau.

VP8CEO - Martin - 14222 - SSB - 0613 - DEC - qsl to: Martin, MPA PO Box 260, Port Stanley Falkland Islands, South Atlantic.

KD7P/NH7 - Bob - 14155 - ssb - 0642 - DEC - QSL for this contact goes to: KA2XX via the Bureau.

5W1IU - Fuji - 14226 - SSB - 1139 - Dec QSL to: JA1WHG via Bureau.

OD5MM - IRMA YL - 14243 - ssb - 0652 - DEC, QSL VIA: HB9CYH via Bureau.

YN5JAR - Jose - 14226 - SSB - 1215 - Dec - QSL to: Jose, PO 122, Jinotepe - Nicaragua.

YS1MO - Mario - 1422 - SSB - 0557 - Dec - QSL to: Mario Augusto Ortiz Aviles, Calle Cerro Verde, 3032 Miramonte, San Salvador, Central America.

RTTY News

Syd VK2SG before he departed on 3 weeks well earned holiday, supplied me with the following interesting RTTY snippets:

N4WFN/C6A - 14078 - 0112Z - QSL to: Jeanie Duff, Box 40842, Reno, 89504 Nev. USA>

VP2EE - 14081 - 0217Z - QSL to: KA3DBN.

HP1XZD - 14068 - 0400Z ARQ - QSL to: Panatronicx S.A., Box 2016, Balboa, Panama

TY1PS - 21074 - 001Z - ARQ.

ZP6XDW - 18102 - 0206Z - ARQ.

9Q5UN - 21085 - 2002Z - QSL to: OH3GZ.

VE8RCS - 14083 - 0332Z. This is the Polar Radio Amateur Club, operating from Ellesmere Island. QSL to: Callbook address.

ZS9Z/ZS1 - 14090 - 2254Z - QSL to: OH2BH.

XU1DK - 14088 - 1120Z - QSL to: Toru, Box 80, Koujmachi, Tokyo, 102-91, Japan.

3W3RR - Romeo - will be for three weeks in Afghanistan, and will operate RTTY for 10 of those days, and will QSL via Dima, UT5RP.

From here and there and everywhere

Yang BV2FB says that more than 600 future amateurs have passed the licensing examinations in BV. At present there are 50 active amateurs there. This number will increase considerably in the near future. BV2FB's QSL Manager is: AA6BB.

I thought, I am reasonably up to date on DX activities, but I was not prepared for a "DX Chain Letter" for "Hams only". This letter arrived on 28 December together with a Christmas card, from a known overseas DX amateur.

The letter urges me to send $1.00 to the first address shown on the list, then it tells me to send 20 copies of the letter to 20 new "ham" addresses and as a happy ending I will receive altogether $8000 in the fullness of time. I will let you in on a secret: I have the $1, but due to the high postal charges, I do not have the money for the postage of 20 letters.

Ken, VK5QW was kind enough to send me copies of the newsletter from the "Southeastern DX Club" located in Atlanta, Georgia, USA. It appears that VK amateurs are popping up in the most unexpected places. At the November meeting of this Club, the guest speaker was Dr Bob Roper VK5PU astrophysicist, who is teaching at the Georgia Technical University. He is well known among his peers and the subject of his talk was: Propagation.

John PA3CXC who operated in ST, said when visiting in Atlanta in November, that the cards of his ST operation will be out by the end of 1990. Incidentally when in ST for the second time, the UN plane on which John was travelling, was shot at and he was grounded for 6 days. John has now a US callsign: KN4NL AE.

Les VK4DA advises that 1Z9CW is a pirate. The alleged QSL manager, KA6V has returned his card and money with that advice.

Neil Penfold VK6NE WIA QSL Manager for VK9 and VK0 advises that operators making contact with a VK9 or VK0 station should write the home callsign of the station worked or his/her QSL Manager's callsign on the back of the card, if the cards are sent via the Bureau. DoTC records supplied for the latest VK callbook appear to have missed about 50% of those for whom the Bureau receives cards.

Neil says as an afterthought: "maybe we have a lot of pirates."

Neil supplied some QSL addresses: VK9YJ to VK3AWY (future March 1991 operation), VK9YQS/O and VK9YQS/LH goes to VK3OT.VK9LE goes also to VK3OT.VK9LI goes to VK2SG. XW4YL goes to JA3UB and VK9CD goes to ZL2CD.

Derek VK3DD says that in the first 12 months of his licence he has worked 158 countries and has 94 confirmed. Not a bad effort.

ET3PG - Bekele - Box 2540, Addis Abeba, Ethiopia, was often heard on Zedam's net (14250). Unfortunately this operation is not yet valid for the ARRL DXCC.

Speaking of the ARRL DXCC, it is known that there is a tremendous backlog in processing these applications. Some additional personnel were assigned to the task of clearing the backlog. As at 16 December, the backlog number was 4108. Processing has begun now on new applications received in Sept 1990, and endorsements received in June 1990.

Festus - 9M8FH has sent 2000 cards and the logs to N5FTR for processing. The wife of Festus, Lorita, has received her callsign: 9M8LL.

14250 kHz in VK is designated as a Fax calling frequency. This allocation is clashing with the net frequency of Zedan YJ3ZH, which has been in existence for approx 20 years. The

"Rare DX net" the other day heard some words "exchanged" between the net controller and a VK station, which maintained that he could not hear YJ3ZH, only a few local VK's. Zedan operates a linear, and he is constantly S9 in VK2.

It was a bit embarrassing to hear how an old timer from VK, who also quoted his pre 1929 callsign which started with OA, got tangled up and mixed up in the "Latin American DX Net". It must have been his first experience of a net operation. This net is very expertly handled by Nathan OA4DX at 1100UTC on 14143 kHz on Saturdays and Sundays.

Toby V47KTG after a lengthy stay on St Kitts, left the Island and is going home and will be QRT for a long time (his words).

There are rumours that Kiyoko the Japanese lady, who for the past twelve months criss-crossed the Pacific several times will be active from Central Kiribati, T31 Canton Islands with the probable callsign of T31KY. I do not envy her. There are tons of QSL cards waiting at her Japanese home address which accumulated over the year, and hopefully all will get a reply.

Ben Pinz W2GUP will be active from British Virgin Islands as VP2V, on CW only, until 6 March. He will favour the 40 to 80 metre bands. QSL to home call, direct only, to: Benjamin M Pinz, 44 Murray Hill Ter, Marlboro, NJ 07746 USA.

In honour of Canada's Winter Games, special prefixes will be used to Canadian amateurs during February. These are: VOI-2 will use VO5-6, VY9 will use VG9, and VY2 will be VG2. VG1 will correspond with VY1, and the common VE1 to VE8 calls will sign as CG1 - 8.

It has been reported that Malyj Vysotskij Island, 4J, will be active again in the Northern Spring (March/April).

Interesting QSLs received

Note W=weeks, M=months, YRS=years, FM=from, MGR=manager OP=operator.

Direct cards received: V44KAY(7WFM OP) J5CVF (3MO FM MGR), PZ1EL (1OW FM MGR) V63AY(6 MO FM OP) ZD9BV (2MO FM MGR) NP2CM (4W FM OP) 4U1UN(2W FM OP) D68A(4W FM OP), DK1CS/H44 (7MO FM MGR) BY4SZ(8MO FM OP), XU8DX(11W FM MG) KG6DX (2W FM OP) VP2EXX (6MO FM MGR) ZF1RC(3MO FM OP), CX7BY(2W FM OP) VP5JM (4MO FM MGR) HC1XM (10W FM OP) AH3C(10W FM MGR) FK8FA("W FM OP) 9V1YC (4W FM OP) WL7BYW (6W FM OP) YL2GW(4W FM OP) C21JM(1W FM OP) WP4U (5W FM OP). Received via the Bureau: no reports.

Thank you

This column would not have been possible without the contribution of the following helpers: VK3DD, VK4OH, VK4DA, VK5QW, VK5WO, VK7MH, VK9NS, CT1DIZ, PS7KM, and the DX Bulletins "QRZ DX" amd "The DX Bulletin".

Many thanks to all of you.

GOOD DX AND 73.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

Over the past month I have been receiving answers to my 'entry level' licence proposal, and at present I have 47 completed forms, many of which came with pages of comments and ideas. I was going to list the callsigns of those who have replied, but I noticed that none of the more prominent callsigns was present. Frankly, I expected more effort on behalf of the policy makers who hold various positions as members of councils, executive committees etc in the WIA. Even if you do not have a CW interest, it is important to think about the issue and make your voice heard. So how about it? Send your form now; it will cost you only a stamp and envelope.

It has been quite a while since we have discussed teaching the code, so this month I am presenting a detailed report on Gary Bold's own computer program, as written by himself!

I have already distributed over a dozen copies of the whole suite of Gary's Morse programs and will be happy to send them to anyone who is interested. Just send me your formatted disk (either 360k or 720k) and a stamped addressed return package.

Apart from the teaching program, there are the following:

FSEND.BAS sends the contents of an ASCII file as audio Morse on the system beeper,

GEJMO.BAS reads Morse from a key connected to the RS232 port,

RNDM.BAS sends random code groups (not for teaching),

TRI.BAS triambic keyer simulator,

RWD.BAS random word generator.

Instructions:

Morse Teaching Program "TEACH.BAS"
For IBM PC/XT/AT and Clones
Version 2.0; 13 November '87
Gary E J Bold ZL1AN
15 Kauri Rd
Birkenhead
Auckland 10
Phone: 43 7240

1. Introduction

TEACH is written in standard MICROSOFT BASIC. I run it under DOS 3.2 with GWBASIC on a 4.77MHz Cleveland. Just load it and read the instructions. See you later.

1a. Later on

Hah! So you tried it and came back? You were probably disappointed, because it seems so boring. Well, learning Morse IS boring. You probably couldn't figure out what it was trying to do. I'll give you a resume:

TEACH asks you to "type the letters as I send them". It times your response. If you don't respond (if you don't know the character) it waits a decent time and tells you what it was, and sends it again. It adjusts the time it waits by averaging the time you take to respond, so you don't have to be a good typist. In fact, your response time has NOTHING to do with its evaluation of your performance. It DOES keep track of your errors. When your error rate is low enough, and no one character is giving too much trouble, it introduces a new character. All characters are sent randomly, but the newer ones, or the ones you have been getting wrong, are sent with greater frequency.

TEACH encourages you to guess. If you guess RIGHT, it puts the letter on the screen as a little reward. If you guess WRONG, it sends the character again without echoing, and waits again. so it gives NO negative reinforcement.

At the end of the session, you get a couple of numbers to enable you to keep track of progress. The "mastery coefficient" says "how well you know each character in use". That is, if you are getting ALL characters correct EACH time they are sent, AND you have been doing this long enough to drop all the error probabilities as low as possible, this will be 100. Zero means you're getting everything wrong. The "overall figure of merit" is the same number, normalised by the number of characters in use when you stop. There are 40 characters. If you're guessing 80 per cent correctly and 20 are in use, this is 80 * (20/40) or 40. So the first number is something to do with "how fast you catch on and retain the characters", the second is "how far down the road you have gone".

2. Background

TEACH is my implementation of a computerised Morse code teaching philosophy originally published by Howard Cunningham in QST, May 1977. There are three main ideas:

(a) A computer is a non-threatening, impersonal thing. People don't get upset by making mistakes if only a computer is listening, whereas they get flustered and embarrassed making fools of themselves in front of people, especially "experts". So a computer should be a good tool for teaching simple mastery skills.

(b) New code symbols should be introduced one at a time, in "postponed discrimination order". This means long, uncommon symbols should be introduced first, to form the habit of listening to the whole symbol before deciding what it was. Also, if the uncommon symbols are introduced LAST (as is usually the case) you don't get nearly as much practice listening to and decoding them! With TEACH, by the time all the symbols have been introduced, you REALLY KNOW all those "terrible uncommon letters at the end of the alphabet".

(c) The teaching process should be ADAPTIVE. That is, feedback from the trainees should be used to modify the teaching process. There is no way a taped teaching system can do this. However, a computer can keep track of all sorts of things. Here it monitors the error rate of each character, the average error rate, the maximum error rate, and the response time of the student. Using these inputs, it decides which characters need to be sent most often, and when new characters should be introduced. There are an infinite number of possible ways this can be done. Howard's algorithm was beautifully simple and logical, so I have just adapted it slightly.

(d) The characters should be learned by SOUND, not SIGHT, and indexed the RIGHT WAY AROUND. Everybody has more trouble READING than SENDING. Hence the "table lookup" that the mind has to do should be ordered with the CHARACTERS indexed by their SOUND, not the SOUND or PATTERN indexed by CHARACTER. For example, if you learn that

"C is -.-." (-.-. preferably, rather than -.-. if)

you have learned to relate a CHARACTER to a PATTERN, which has to be CONVERTED into a SOUND. So your mind conceptually has to do an ordered search of the table ("is it A? Is it B? Is it C? yes!"). If you learn the characters indexed by sound, your mind is able to do a "hash table search", (jump straight to the right character) which is much faster. ("dahdidahdit — that's C"). If you don't understand that, it doesn't matter. Just trust me; I know what I'm doing. This is true. You will learn Morse symbols using TEACH in a way that will make it easier to gain speed.

(e) At the session end, you get some diagnostic information.

(i) The number of characters in use (maximum 40).

(ii) Your "quickness coefficient": This is supposed to represent roughly how fast you catch on. It's computed at line 8050. This will be zero if your average error probability, over all characters, is 1 — that is, you haven't remembered ANY character correctly. It will be 100 if currently you are not making ANY mistakes on any character that has been introduced. (If a character has JUST been introduced, however, there may not have been time for you to reduce its error probability to the minimum allowed).

(iii) Your "figure of merit". This is the same number, normalised by the total number of characters in use. That is, when you know ALL characters PERFECTLY, it will be 100. Then you can stop.

Unlike my Commodore 64 version of TEACH, there are no machine language subroutines. GWBASIC supplies intrinsic SOUND statements which can be used to form the symbols. The frequency (FRQ) code speed timing is set at line 20. DOL and DAL are the dot and dash relative times. The code speed is supposed to be 12wpm. Some users have suspected that this is wrong. It is correct on my Cleveland, running at 4.77MHz, and my Concord, running at 7.2MHz, but it may be BASIC version dependent. You can test the speed on your machine and reset it, or set it to ANY speed, as follows:

There is a sub-routine at line 4000 which sends a dotstream for 10 seconds and counts the number of dots. From this it works out the correct value of parameter DOL (dotlength) for 12wpm, using the fact that 10 dots/second is 24wpm. Call this sub-routine in immediate mode. It will beep for 10 seconds and tell you what the parameter DOL at line 20 should be set to. The default value is 1.82, correct for my machines. If yours says something different, set it to that. For 15wpm, set it to 12/15 times that etc. If you do this and save the program, it will be correct from now on.

The audio frequency is parameter FRQ, also set at line 20. This number is used as a parameter for the SOUND instruction (see lines 1010, 1030). it's the frequency in Hz. Change it if you don't like 800Hz.

Let me know how you get on — if you can spare time to drop me a line.

REGARDS & 73,
GARY E J BOLD
ar

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

Amateur examinations are generally devised to try to determine the extent of a candidate's knowledge — ie the amount of factual material retained — and ability to manipulate this data in some way. Rarely do we set out to determine the ability to extract information from a piece of text, or find a specific fact or theory in a mass of reference material. We tend to assume that the research or referencing skills will develop of their own accord, or that students have some innate ability which will be sufficient.

Few candidates pass the amateur examinations without being exposed to a few of the traditional text and reference books, but the emphasis at the early stages is always on trying to cram the facts and processes into the memory banks, and then being able to retrieve them as required. However, I tend to doubt that straight memorising is so important. A few years down the track most will not be prepared to trust their memories completely, and it then becomes important to be able to find the desired data easily. New material that has not been learnt must also be available for evaluation and consideration, and changes in regulations, agreements or accepted practices occur at frequent intervals. The concerned amateur must be able to keep up to date with the growth and development in several fields.

I doubt if any reader can look at any of the pages of reference material in this issue and say "I know all this. It has not changed since I learnt it." So an issue such as this becomes doubly important, as both a ready source of information and an updating of the data.

Let us encourage the new recruits to learn how to find information as well as how to memorise it; to be aware that changes occur, and to be sufficiently flexible to accept the changes and live with them.

Many candidates will be attempting examinations within a few weeks. They should be reminded that a pass in the examination does not free them from all future needs to learn, to find out, and to understand.

My best wishes to those candidates.

73 Brenda VK3KT

Federal Education Co-ordinator, WIA

ar

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

Well, the momentous changes in Eastern Europe finally reached one of the most closed societies in the entire world. I am referring to Albania — that small country on the Mediterranean, between Greece and Yugoslovia. Those who have been long-term listeners to Radio Tirana, will easily remember that it has carried propaganda in the Stalinist format and many found it to be one of the most boring European broadcasters.

Albania broke with the Soviet and Chinese Communist parties and went alone until it couldn't ignore the changes that swept Eastern Europe and the USSR. Late in December 1990, the domestic pressure finally built up as the citizens wanted change, after over 45 years of self-imposed isolation. Other political parties were formed as bans on political and religious association were lifted. R Tirana at least, has now begun to broadcast a more balanced output with western music, replacing the political rhetoric that has long dominated their broadcast output. Listen for yourself on 9500 from 0630 UTC.

At the time of compiling this column, there was still a fortnight to go before the UN deadline came into effect over the Iraqi invasion of Kuwait. Yet it was apparent that things were brewing, judging by the increased amount of traffic on US military circuits on HF. Listen on 11267 or 18002kHz USB and you will hear quite a deal of traffic, presumably from or near the Gulf region. The best period is around 0300 to 0600 and again from 1000 UTC. Monitoring these channels brings back memories of high density traffic over HF circuits during the Vietnam War.

Recently, a friend brought me his Kenwood R2000 to compare it with the Icom R70 that has been the principal receiver at this location. The R2000 has 10 memories with the facility of being able to scan between two predetermined points, eg 7.0 to 7.15MHz. It has an inbuilt clock with which you set up to record programming in your absence. It has the standard modes such as USB, LSB or AM plus FM, which is standard, not an optional extra, as is the case with Icom R70. Sensitivity appears to be down compared to the Icom and it is a poor performer on MW, adequate on SW. The mode I primarily utilise, Exalted Carrier Selective Sideband (ECSS) on the Icom is virtually non-existent on the Kenwood. Yet it does appear to be slightly more sensitive on the higher end of the band, around 25MHz and above.

Incidentally, it does pay to install a coaxial feedline as I have recently found out. I have been lent a trap dipole for 80 and 20 metres and it clearly is more resonant than my humble G5RV. This same friend has also found that a coaxial feed minimises electrical noise compared to an open-wire feeder.

Well, that is all for February. Remember that you can write to the address, or those with packet facilities can leave traffic for me at VK7RH @ VK7BE-1 Launceston. ar

REPEATER LINK

WILL MCGHIE VK6UU
WATERLOO CRESCENT LESMURDIE 6076

Pagers

If you operate on two-metres FM, chances are you will have heard pager interference. That awful loud noise of several seconds duration that makes you dive for the volume control. Pagers operate just above the top end of the 2m band. Just above is an understatement, as little as 12.5kHz above 148MHz. Not all pagers operate on this frequency, but are found from this frequency up. The power levels that pagers are run are around 500 watts ERP. Little wonder that they have the potential to cause problems in the 2m band.

Pagers are not going to go away, and the problem they cause to our repeaters on 2m can only increase. To minimise the interference they cause, it is important to understand how this interference is caused. Overload in the repeater's receiver producing intermod signals is the major problem. Intermod, in simple terms, is the mixing of two or more signals in a non-linear device to produce a new signal on a new frequency. If this new signal is on the repeater's receive frequency, then you are stuck with it. The repeater's receiver is already up against it, as there is one very strong signal present when the repeater is in use; that being the repeater's transmitter. What all this means is that it is a tough environment. In fact, the problem is not just limited to the repeater's receiver. The intermod signal can be generated in another receiver and radiated into the repeater's receiver. This other receiver does not even have to be turned on. Furthermore, the intermod can be generated in the junction between metal objects on the tower and guy wires, and that includes the repeater's antenna.

With all these problems it is a wonder that more intermod signals are not heard on our repeater network. However, an understanding of the problems results in solutions to most of the pager overload on 2m. The choice of a receiver with high performance when subjected to strong nearby signals is the most important. All other cures for intermod are needed to prop up the receiver's overload performance. Following is a number of suggestions to reduce pager intermod.

1. Only use an RF pre-amp if it is the sole solution to poor receiver sensitivity.
2. If you do use a pre-amp, place a very lightly coupled cavity filter between the output of the pre-amp and the input to the receiver. Cavity filter insertion loss of up to 10dB results in a very narrow bandwidth such that signals 100kHz away are a further 10dB down. This method was successful in eliminating pager interference from one of our repeaters in VK6.
3. Improve the RF isolation between the receiver and transmitter, as the intermod problem may be between a pager and your transmitter.
4. Install a front-end crystal filter. Yes, that's right. You can purchase a 50-ohm input output crystal filter custom made to your repeater's receive frequency. With a bandpass of 15kHz and all other frequencies greater than 20dB down it may solve your intermod. Such filters are not cheap (around $150), but it is one more way of removing the pager noise. By the way, these filters are made in Australia.
5. Orientate your receive antenna away from the pager.
6. Installing a normally coupled cavity filter may help in some situations, but with the pagers being so close frequency-wise, a single cavity filter is only a few dB down and usually has no effect.

CTCSS and Pagers

Fitting CTCSS to a repeater's receiver would not greatly reduce pager intermod. Only intermod that triggers the repeater without there being an amateur signal would be eliminated. An amateur signal running CTCSS would still suffer from pager intermod, if the pager signal is stronger. This is an important benefit in reducing pager intermod. The pager noise at the end of an over, where it is most often heard, would be gone but CTCSS is not a total solution to his growing problem.

Not all pager intermod you are hearing is at the repeater. A considerable amount can be produced in your receiver. Depending where you operate, most of the pager intermod you are hearing may be being produced in your receiver. If your local repeater is CTCSS encoded so that you can run your receiver in the CTCSS mode, then intermod problems in your receiver can be reduced.

Positive Offset

Consideration is being given to reversing the positive offset above 147MHz to a negative offset. If this is made mandatory, it will only limited the options available to repeater co-ordinators to manage pager intermod problems. A better solution is the one that is currently being implemented: that being reversing the frequencies where a reduction in intermod results. Pager intermod occurs not only because the repeater's receiver is close in frequency, but has the wrong combination of frequencies — some close, some further away. There would be situations where a negative offset above 147MHz suffered more pager intermod than a positive offset. Repeaters in the 146MHz to 147MHz segment also suffer from pager intermod, and they enjoy a frequency separation away from the pager band off up to 2MHz. Let us not limit our options by making the reversal of the 147MHz to 148MHz mandatory. Close frequency co-ordination would be essential, as two repeaters operating on the same frequency but with opposite offsets would lock each other up whenever propagation permitted.

Postscript

This article is the first to be written using a computer and word processor. Yes, the world of computers has finally arrived for me. I now know why so many amateurs are rarely heard from again after purchasing a computer. 73.ar

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074
PACKET: VK5EA@VK5WI

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
INFORMATION NETS
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz
(7.064MHz is the frequency presently in use)
AMSAT SW Pacific 2200 UTC Saturday, 14.282MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has over 310 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services, send a SASE to Graham.

BADR Decays

HR AMSAT News Service Bulletin 356.03 from AMSAT HQ

Silver Spring, MD 22 December 1990

To all radio amateurs BT

Pakistani 'Amateur' Satellite Re-enters Earth's Atmosphere

A Pakistani satellite launched by the People's Republic of China earlier this year re-entered the Earth's atmosphere either late on 8 December 1990 or early on 9 December 1990. The satellite, dubbed BADR, had an output frequency of 145.825MHz, a frequency also used by UO-11 and DO-17. It was never quite understood why the Pakistani Government assigned the 145.825MHz output frequency when there was no amateur transponder on board or any published telemetry information which might have been of use to the amateur service.

Below is a beginning and ending snapshot of selected orbital parameters of BADR

1990 Day	Perigee (km)	Apogee (km)	Eccentricity	Period (min)	Mean Motion Decay	Mean Motion Orbits/Day
219.0	203.6	934.8	0.0526	96.05	0.0023	14.99
342.4	126.8	169.8	0.0033	87.45	0.2155	16.47

Microsat Update

HR AMSAT News Service Bulletin 356.02 from AMSAT HQ

Silver Spring, MD 22 December 1990

To all radio amateurs BT

Microsat Engineering Team Status Report as of 21/12/90

Summary:

AO-16 — sending PHT telemetry, file system running for beta test.

NASA 2-Line Keplerian Elements 20 Dec 90

```
AO-10
1 14129U 83 58  B 90341.95721150 -.00000028  00000-0  0000000 0  6254
2 14129  25.9787 171.4752 5963895 198.6418 123.7551  2.05881045 56284
UO-11
1 14781U 84 21  B 90348.59001325  .00001862  00000-0  34812-3 0  8903
2 14781  97.9280  35.0711 0013549  40.4256 319.8075 14.65971484362393
MIR
1 16609U 86 17  A 90352.55649387  .00010029  00000-0  12381-3 0  1497
2 16609  51.6080 121.9393 0024874  19.0372 341.1684 15.60505683276897
RS-10/11
1 18129U 87 54  A 90351.85617242  .00000340  00000-0  36228-3 0  4635
2 18129  82.9253 192.8256 0011303 336.3188  23.7477 13.72131792174632
AO-13
1 19216U 88 51  B 90350.40377437 -.00000209  00000-0  99999-4 0  2267
2 19216  56.8563 120.5684 7087146 242.6692  30.6150  2.09704934 19197
UO-14
1 20437U 90  5  B 90348.72021130  .00000504  00000-0  21575-3 0  2827
2 20437  98.6882  64.1817 0011775 351.2327   8.8686 14.28815910 46645
UO-15
1 20438U 90  5  C 90344.64739052  .00000301  00000-0  13603-3 0  1775
2 20438  98.6898  60.0706 0010697   2.6758 357.4489 14.28494977 46057
AO-16
1 20439U 90  5  D 90350.65779471  .00000553  00000-0  23440-3 0  1817
2 20439  98.6917  66.3270 0011496 346.3025  13.7848 14.28917213 46928
DO-17
1 20440U 90  5  E 90350.64728474  .00000591  00000-0  24966-3 0  1811
2 20440  98.6894  66.3379 0011497 347.4225  12.6667 14.28976305 46923
WO-18
1 20441U 90  5  F 90350.62507160  .00000527  00000-0  22411-3 0  1819
2 20441  98.6916  66.3578 0012177 346.9534  13.1332 14.29054441 46927
LO-18
1 20442U 90  5  G 90349.97899473  .00000520  00000-0  22088-3 0  1821
2 20442  98.6915  65.7509 0012420 348.5551  11.5368 14.29126182 46835
```

DO-17 — sending PHT telemetry, no other changes.

WO-18 — sending PHT telemetry, dark image testing.

LO-19 — sending PHT telemetry, being reloaded.

FILE SYSTEM: We have again loaded what we hope is the final version of the first general release of the file system. UO-14 has also been reloaded. This latest reload was caused by a bug that was added while fixing several other bugs.

Jeff Ward GO/K8KA has also made some tweaks to the final version of the general release of PG. It is currently on UO-14, and we'll start it broadcasting from AO-16 this weekend. It will be compressed with ZIP. PB, the broadcast receiver, has been available on CIS for several weeks, and is available on several other BBS systems. The first version of PG was released on CIS and via UO-14 on 19/12/90.

UO-14 has already been released for general access. We want to do one more round of beta-tester access on AO-16 before exposing it to the masses. The previous bug was found quickly because each of the beta testers sent in their PG.LOG file which was matched to the post-mortem dump taken from AO-16. The next target for AO-16 release is 24 December, provided there are no further problems.

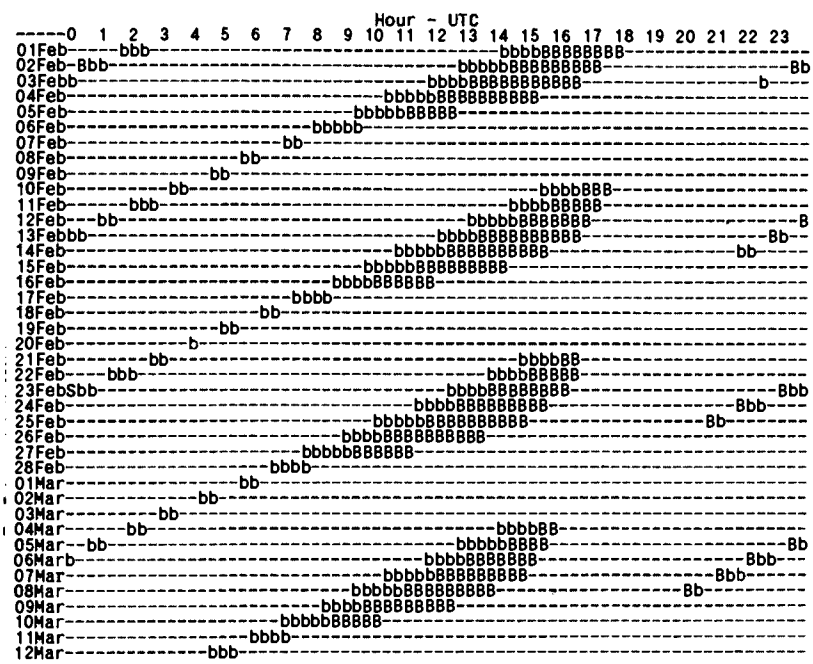
If you get a copy of PG, do not try to use it on AO-16 until you see a specific message announcing that AO-16 is available for general use. You will need a special command in the PG.CFG file to access AO-16 and this command will not be documented until AO-16 is available for general use.

TELEMETRY: The diagnostic "wash" status message has been removed in this upload. The edac error counter now appears in the status message, in status [17]. This status cell was previously unused. We have done this to reduce the overhead on the downlink.

AO-16: The AO-16 BBS was restarted on 21 December 1990 at 19:14 UTC. At this writing, it has survived three passes over the US with a reasonable load. WD0E, WB9ANQ, N4HY and NK6K generated 290 activity log entries, activities like logon, logoff, directory, upload and download. We will continue testing with a limited number of beta users, if all goes well, AO-16 should be open for general use in a few days. The more discriminating users will notice that the AO-16 downlink, when broadcasting, is different than it has been in the past. This version of the BBS uses only one buffer for the broadcast output queue; the previous version used three. That meant that, even during slow operations like an upload file close, when the entire file is scanned and the header checksum is computed, there were enough buffers for the DMA to keep the transmitter busy. With only one buffer, there will be occasional gaps for as much as a few

OSCAR-13 Schedule for 1 February to 12 March 1991

Station: Adelaide



SATELLITE ACTIVITY FOR SEPTEMBER/OCTOBER 1990

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1990-							
085A	PROGRESS M-5	27 Sep	USSR				
086A	METEOR 2-20	28 Sep	USSR	104.2	975	953	82.5
087A	COSMOS 2101	01 Oct	USSR	89.2	321	180	64.8
088A	USA-64	01 Oct	USA	356.9	20413	165	37.6
089A	PRC-33	05 Oct	China	89.3	295	199	56.9
090A	STS-41	06 Oct	USA	90.2	303	280	28.4
090B	ULYSSES	06 Oct	USA				
091A	SBS-6	12 Oct	ESA	795.5	36450	7675	3.1
091B	GALAXY VI	12 Oct	ESA	641.6	36419	201	6.9
092A	COSMOS 2102	16 Oct	USSR	89.7	360	192	62.8

2. Returns

During the period 45 objects decayed, including the following satellites:

1990-069A	COSMOS 2089	01 Oct
1990-082A	RESURS-F9	21 Sep
1990-089A	PRC-33	23 Oct
1990-090A	STS-41	10 Oct

3.Notes

1990-085A PROGRESS M-5

Docked with spacestation MIR on 29 September 1990 to deliver consumable and other cargo.

1990-090B ULYSSES

Was deployed from the orbiting STS-41. Its mission is to explore the heliosphere over the full range of latitudes, especially the polar regions.

1990-091A SBS-6 and -091B GALAXY VI

These telecommunications satellites were launched by European Space Agency, using the Ariane 441 launch vehicle, from Kourou French Guiana, for the United States.

BOB ARNOLD VK3ZBB

seconds. The number of broadcast buffers may be increased in the next version; this version is an experiment to see how much free memory is available in the minimum configuration. Aside from causing the developers' hearts to miss a beat, the pauses are not a problem.

DO-17: Now that the AO-16 BBS software is stabilising, attention is turning to DOVE. N4HY is to begin preparing a special loader for DOVE shortly.

WO-18: There have been no operational changes to WO-18 this week. The WEBERSAT command station has been downloading various dark side images this week to gather information on minor CCD defects which can be subtracted from normal images. They are also attempting to see if, with sufficient post-processing, stars can be discerned.

LO-19: LUSAT was reset to the ROM and rebooted early on 22 December 1990 UTC in preparation for loading the BBS. The BBS code will be loaded from the LUSAT command station in Argentina. There is no announced date for general availability of the LO-19 BBS.

The following recommendations for TNC parameters are made for use with the AO-16 BBS.

These settings are compatible with the multi-user 1200-baud downlink.

Activity Log: The following request is made by GO-K8KA for UO-14 and by NK6K for AO-16. Please do not download the activity log files (ALyymmdd). They are very large now, primarily for use in debugging, and several downloads per pass is inefficient. The previous day's AL file will be put in the broadcast rotation. A program to display the file will also be broadcast.

UO-14 Update

HR AMSAT News Service Bulletin 356.01 from AMSAT HQ
Silver Spring, MD 22 December 1990
To all radio amateurs BT
UoSAT-OSCAR-14 File Server Available for Access

After final testing of groundstation and spacecraft software by the beta testers, the UO-14 File Server 'PBBS' is being released for general access. Any suitably equipped stations are welcome to use the system. The UO-14 engineering team encourages users to report their early experiences of UO-14 BBS operations. They are particularly interested in hearing how you have connected 9600-baud FSK modems to various radios.

UO-14 is currently broadcasting a file containing groundstation client software for IBM-PC compatible computers; users who are already receiving the PACSAT Broadcast Protocol transmissions can 'bootstrap' themselves simply by receiving this broadcast. The file, number 791, is a .ZIP file containing PG.EXE and associated documentation. This file will also be posted on Compuserve and will migrate to other information sources. If you are not already using the PACSAT Broadcast Protocol, make sure to get the PACSAT File Header utility programs PFHADD.EXE and PHS.EXE as well as PG.EXE. The GO/K8KA groundstation software works on both AO-16 and UO-14. As updated versions of the PACSAT Protocol Suite are released, they will be carried as files on the satellites themselves in the same way that file 791 is carried now. The AMSAT Software Exchange is making copies available of this and other PACSAT related software via AMSAT Headquarters.

You MUST have proper groundstation software before you can access the UO-14 or UO-16 file servers. The PACSAT Protocol Suite has been specified and widely published. At least two software authors (other than GO/K8KA) have used these specifications and written groundstation client software for the IBM; implementations for other popular computers should follow in the New Year. ar

DIVISIONAL NOTES

FORWARD BIAS

PHIL CLARK VK1PC

Due to pressure of other affairs, I have not been able to write this column for some time, and this will be the last during the term of the present committee.

The February meeting is the Annual General Meeting of the VK1 division and we would welcome any new members on the committee, especially some of our younger members. What about it? How about nominating for committee? This could be your chance to get some of the things that YOU want the division to provide for the hobby of amateur radio. It is certainly not an arduous task and does not take up a great deal of time.

If you are not able to serve on the committee, how about lending a hand to staff the divisional office. Volunteers are needed for a couple of hours on Monday and Wednesday evenings from 6pm to 8pm, on Fridays from 11am to 2pm and Saturdays from 9am to 12 noon. If you can help out, even if only occasionally, please contact Gavan VK1EB, QTHR.

Technical notes

Two members of the division, Tom VK1BUD and Dick VK1ZAH, have developed a simplex (single frequency) repeater for emergency communications use. This "store-forward" repeater has been used in exercises and proven effective and simple to place into service. A unit has already been purchased and used by the Queanbeyan headquarters of the State Emergency Services of NSW to improve its communications. The fact that the device can simply be plugged into almost any existing radio on any frequency to change it into a repeater gives it great versatility. It can be set up to record a maximum-length message from 30 seconds to about two minutes. The repeated message is identified by a tone burst at the start and finish, and is only as long as the input message, up to the maximum length. The options allow for a Morse code identification to be included if required. The current consumption is very low and the device can be readily operated from dry cells. Enquiries about this device can be made to Tom VK1BUD via the VK1 division, GPO Box 600, Canberra ACT 2601. It is available at a cost of $250 in kit form (no box) including post and packing, or $300 assembled in a box and tested.

Some time ago Neil VK1KNP decided to put onto one board a 1200/300-baud modem based on the 7910, together with a 4800-baud modem based on the HAPN 4800-baud modem. This circuit has been built and tested and a complete set of instructions written. A run of 20 circuit boards was made in August 1990 and a second run of 20 boards was ordered in October. This board is designed to run with a TNC and MUST be used in conjunction with one. It is NOT suitable for use with the Commodore 64 running AAPRA, Digicom or similar software. The modem board can be run from either a single 12-volt supply using an on-board negative rail generator, or it can be run from an external +/- 12-volt supply by deleting the on-board generator. The board is available from the Canberra Amateur Packet Radio Group, ACT Division, PO Box 600, Canberra ACT 2601, at a cost of $40, which includes post and packing. The kit includes the printed circuit board, full instructions and circuit details.

Demonstration Station

George VK1GB and his band of hardy helpers have been doing a great job of promoting the hobby of amateur radio in the "deep" north, with the demonstration station at the Hall markets on the first Sunday of each month. Volunteers are still needed to help man (person?) the station and to explain the equipment and hobby to anyone interested. George has reported considerable interest at the station and it has already attracted some new members to the division. If you can help out with this station, please contact George VK1GB QTHR or via 2m. You do not need to spend much time and you don't have to come every month, but the more we have, the less each has to do. So what about it? Will YOU come along and help promote amateur radio to the community? George would certainly be pleased to hear from all those who can help out.

73 UNTIL NEXT TIME,
PHIL

VK2 NOTES

TIM MILLS VK2ZTM

AGM Time: It seems that no sooner is one AGM held than another is upon us. The 1990/91 AGM of the NSW division will be held on Saturday afternoon, 4 May 1991 at Amateur Radio House, 109 Wigram St, Parramatta. The closing date for agenda items and council nominations will be 2pm on Wednesday, 20 March 1991 at the registered office, 109 Wigram St, Parramatta.

WICEN (NSW) Inc: Some of the coming events for WICEN include the Bungonia cave rescue on the weekend 9/10 March. Morton VK2DEX is the co-ordinator. The mid-year VRA conference will be at Narrabri 16/17 March, and the annual conference in Sydney in September. The Hawkesbury Canoe Classic is 19/20 October. An 80m net for WICEN has been recommenced on 3620 +/- QRM Tuesday evenings. Photo IDs are being introduced for WICEN (NSW) members. These will be based on a three-year membership period from 1 July 1991. Some interim photo IDs have been issued in some regions. WICEN membership continues to expand. Details can be obtained from your local club or write to PO Box 123, St Leonards. A questionnaire was included in the last WICEN newsletter. If you are still to return yours, please do so.

Bookshop: A reminder that the division maintains a large range of publications. Stocks are available of the 1991 ARRL Handbook and USA and international callbooks. Only a few of the Australian callbooks remain.

Coming Events: The annual Gosford Field Day will be held on Sunday, 17 February. Next exam is Tuesday evening, 19 February. Applications close 29 January. Urunga Convention will be held over Easter. The next Trash and Treasure will take place on Sunday afternoon, 24 March, a week earlier due to Easter. Would clubs and groups keep the office advised of major activities, meetings and exams so that enquiries can be answered on your behalf.

Council Meetings: Recently it was decided to conduct meetings twice a month, usually the second and fourth, which means that meetings will often conclude before midnight!!

Surplus Manuals: Aub VK2AXT Divisional Librarian has been sorting out the range of equipment manuals held in the library. There is now an excess of some and they will be disposed of. Listen to the VK2WI broadcast for details.

New Members: A warm welcome is extended to the following who became members of the NSW division towards the end of last year.

A Asahina	VK2BEX	Killara
G A Berry	VK2XBZ	Narara
A B Burrow	VK2FOW	Coffs Harbour
C D Burnett	VK2XRL	Nimbin
J P Cabouche	Assoc	Port Louis, Mauritius
D T M Connor	VK2MJX	Wyoming
N R Cunningham	VK2RD	Port Macquarie
F W Eade	VK2AEE	Kotara
R J Hughes	VK2YOW	Wollstonecraft
S G Mamo	VK2NY	Gerringong
D Pack	VK2GIO	Mt Pritchard
M J Ramplin	VK2XMR	East Maitland
B J Ward	VK2WBJ	Caringbah

Publicity: Good and bad. Amateur radio received extensive publicity with the first AUSSAT/Gladesville test last November, and no doubt with the recent test at the end of January. *Electronics Australia* for this month has a report by Tom King VK2ATJ on the first test. The ABC provided publicity for amateur radio in the Bob Hughes segment on Sunday, 23 December. Bob conducted a 10-minute interview with divisional president Roger VK2ZIG and Julie VK2XBR which was trans-

mitted to New South Wales and Tasmania. Amateur television can become very public, as more people discover the UHF channels. On New Year's Day, it appears that a member of the public was searching the UHF spectrum trying to copy a cricket broadcast from outside Sydney. He came across an ATV transmission which he just had to tell one of the newspaper groups. A report appeared in one of its columns stating that instead of cricket they found a "clear picture of a fat man about 50, sitting in a pair of underpants, looking out at them". The report went on to describe someone's shack, together with a jumbled version of his callsign. No doubt it was a hot day and the supposed underpants would have been shorts. It is important that vision transmissions do not get the public wondering what it is all about. It is going to be hard enough to retain spectrum space for wideband transmissions without giving grounds to remove frequencies for more 'important services'!! Remember, WARC 92 is drawing

VK3 NOTES

JIM LINTON VK3PC

Victoria's RD Win

After a drought of 13 years the WIA Victorian Division has won the Remembrance Day Contest. Congratulations go to those individuals and club station which entered the contest and submitted logs contributing to the win.

Behind their collective effort was a driving force encouraging greater participation in the contest. Geoff Hudson VK3VR had worked hard to ensure Victoria won in 1990. Seven years earlier his friend Greg Williams VK3VT produced a contest kit and tried to lift the level of participation. Greg ran a campaign centred around the free kits and pushed for more VK3s to get into the contest, despite the apathy which seemed to be rife.

After a poor performance in the contest over a number of years, Geoff VK3VR decided to target 1990 for a maximum encouragement effort. "Geoff worked really hard and was the driving force behind the move in 1990 for Victoria to win," Greg Williams said. Among the new things Geoff did was to effectively use the VK3BWI broadcast to promote the RD contest.

He publicised the availability of a free contest kit — several hundred were distributed. Geoff also produced RD contest software. Working quietly behind the scenes he prepared scripts for VK3BWI, including a series of hints and words of encouragement from regular contesters. Those who had a score of 300 or more in the previous RD contest were sent a letter with a return slip asking them to give an undertaking to enter and put in a log. And, as the closing date for the contests logs approached, Geoff phoned quite a few he had heard on air to remind them to submit logs.

Geoff Hudson says with just a little bit more effort Victoria has a very good chance of winning the RD contest for the next two years. Let's give it a real go this year and try to keep the perpetual RD trophy in Victoria.

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

I trust that you all had a safe and enjoyable holiday season and are now back at work or study with renewed enthusiasm.

Those who missed the Christmas meeting at Woodville Community Hall missed out on a good night of fun, food and friendship. Those who worked so hard to put it all together must feel a little disheartened at the lack of attendees. The speaker, Keith Rendell, had a very dry and subtle sense of humour and gave us something to think about in his talk on "Humour is no laughing matter". Our thanks to the ladies for the excellent supper; John Butler VK5NX for organising the drinks; and the council and anyone else who helped to make it happen. I wonder why more people don't attend such a good night. Is it just that there are too many things happening at that time of the year, or is council on the wrong track putting on a night like this? Perhaps you should let them know your thoughts. The ICS award was presented to Kevin May VK5IV for his services as Broadcast Officer over the past four years; and Hon Life Membership certificates were presented to Bill Wardrop VK5AWM and myself. We were pleased to welcome visitors from VK6, Christine VK6ZLZ, Cliff VK6LZ, and son Mark Bastin. Formerly from VK5 some 10 years ago, they were back here on holiday.

Diary Dates

Sat 2 February WIA holding examinations at BGB

Tues 26 Feb WIA general meeting 7.45pm (open from 7pm for ESC, QSL Bureau, Publications etc)

Sun 24 March Barossa Picnic, Mount Pleasant Oval, 11am. (I may have to eat my words regarding last month's info on this. My latest communiqué says "sausages and bread" will be for sale, so there may not be salads for sale!)

VK7 NOTES

TED BEARD VK7EB

VK7 Annual General Meeting

All members please note: the Annual General Meeting of the VK7 Division shall be held at 105 New Town Rd on 23 March 1991, commencing at 2pm.

All Notices of Motion for the AGM must be received by the Secretary not less than 28 days prior to the meeting, and must be signed by at least three (3) members.

Nomination of candidates for election to council must be received by the Secretary, in writing, not less than 21 days before the AGM.

Not less than 10 days before the AGM, should an election be necessary, a ballot paper shall be posted to each member of the Institute, and is to be returned to the Secretary prior to the commencement of the AGM.

Proxies are to be deposited at the registered office of the Institute, 105 New Town Rd, Hobart at least 24 hours before the time appointed for the meeting.

All the above items are in accordance with the Articles of Association.

E A BEARD
VK7 DIVISIONAL SECRETARY
ar

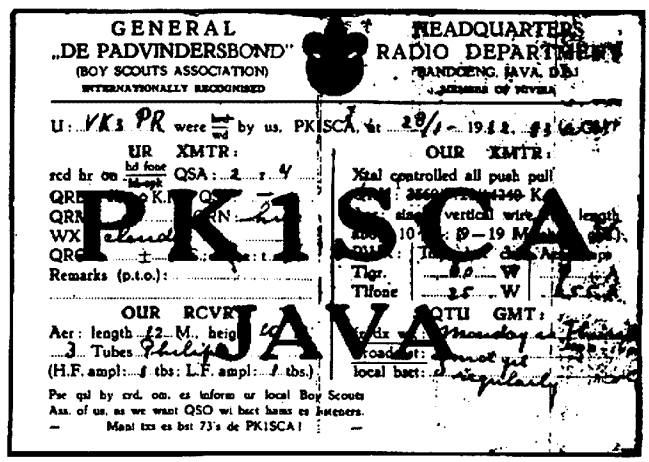
QSLs FROM THE WIA COLLECTION (28)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

The Boy Scouts Movement and Amateur Radio — Part 2

JOTA (Jamboree on the Air) is the link between the Scout Movement and Amateur Radio. Conducted in October each year, it is a means by which international understanding and goodwill can be fostered throughout the world. It is emphasised the JOTA is not in any way a competition but simply a way of bringing Scouts together through amateur radio. The event lasts 48 hours over one weekend, and a certificate from Scout HQ is sent to all those radio amateurs taking part and who notify their participation in the event. The Jamboree on the Air 1990 made use of Australia's domestic satellite, AUSSAT, for the relay of traffic across the nation on frequencies other than HF. The year 1990 saw the introduction of two new awards for those stations that took part in JOTA. These are the "Radio Scouting Award" and the "JOTA Award", details of which are to be found in the October 1990 edition of *Amateur Radio*.

Of the 100 or so countries taking part in JOTA each year, Australia is probably the most active. It was estimated that approximately 30,000 persons (including visitors to amateur stations) were involved in the 1989 JOTA and that no fewer than 683 amateur



stations reported their participation in the event to Scout HQ. Each year an official opening of JOTA is conducted through VK1BP, the Scout Association HQ station.

Although scouting started about 80 years ago, it has been only since 1958 that JOTA has become an established event. Like scouting, JOTA started in England when a group of scouts, who were also radio enthusiasts, set up a station at Sutton Park during the Ninth World Scout Jamboree. It was during May 1958 that Leslie Mitchell (an ex-ASM in America) organised the JOTA using his own call, G3BHK. Of course, before the first JOTA there had always been a strong link between Scouts and amateur radio enthusiasts. One tends nowadays to associate Scouts and amateur radio with the post-World War II years. However, ever since DX as we know it (which really assumed importance in the early, and especially, mid-1920s) there had been radio operators who shared the hobbies of radio and scouting. In the October issue of QST 1972 in the article entitled "Ham Radio — Scout Style" mention is made of the fact that as early as October 1912, the British experimental station XBS operated by Mr H R Phillips engaged in Scout activities on the air. Operation was on the old 200m band, range being about five miles. It was regularly on the air using, of course, spark transmission.

PK1SCA

This QSL of the WIA Collection is dated January 1932. The QSL emanating from Java (a DX country in those days) was from the Boy Scouts Association of Netherlands East Indies. This association was called "General de Padvindersbond" which, when translated, means "Pathfinders' Group". The recipient was Ron Jardine (SK) VK3PR of Leongatha. At the bottom of the QSL we read, "Pse QSL by crd, om, es inform ur local Boy Scouts Ass of us, as we want QSO wi bsct (bcst? = broadcast) hams es listeners".

VK3WIA

Before the first JOTA, the Federal station, VK3WIA, undertook amateur radio operation on behalf of the Scout Movement. A special QSL was printed in 1955 on the occasion of the Pan-Pacific Scout Jamboree held at Clifford Park, Victoria during December 1955/January 1956. The Federal Committee of the WIA had received a request for the Pan-Pacific Scout Jamboree Committee to provide an amateur radio at the camp so that Scouts could not only see a station working but be able to communicate with other Scouts from all over the world. The Federal Executive offered its own station, VK3WIA. The PMG (as Telecom was then known) granted the special use of higher than normal power (500 watts); the RAAF helped along with petrol-driven alternators for the purpose; whilst an Army Signals Unit erected six directional V-beams for the station. The QSL shows the four giant boomerangs which marked the entrance to the camp. (See *Amateur Radio* October 1985, "History of Jamboree on the Air" by the late Max Hull, VK3ZS (then the Federal Historian) for fuller details.

VS6AJ

This attractive QSL was sent from Boy Scout HQ, Hong Kong. The Scout depicted on the card epitomises the spirit behind the Scout Movement. It was a firm belief of its founder that scouting was an activity to be enjoyed and that it should entail a spontaneity from children in contrast to the routine drill-based training in education practised in BP's time. Like many other members of the British Empire, Hong Kong started scouting very early, just one year after Australia's entry into the movement. The Scout shown wears his uniform which has been adapted throughout the world to fit in with national custom. The Scout emblem on his hat is taken by many to represent a Prince of Wales feather, but is really an arrowhead which shows north on a map or compass. The symbol is related to army scouting and symbolically guides the young Scout in the right direction. The arrowhead has three points which remind the Scout of the three Scout promises (duty of God and the Queen, helping others and obeying the Scout law). The emblem is often enclosed with a ring of rope tied at the base with a reef knot (one of the simplest and most secure of knots) which is to remind the Scout of his duty to do a good turn for somebody every day.

Scouting started in Australia in 1908. In fact, along with Belgium, Gibraltar, Ireland, Malta, New Zealand and South Africa, Australia was amongst the first countries to form a scout organisation. The year also marked the date of the first Scout camp (apart from the experimental camp held the previous year) conducted in Northumberland, England.

The WIA Collection contains a considerable number of especially allocated calls to Scout stations throughout the world. In the majority of cases a special callsign suffix has been granted. The QSL cards celebrate, amongst others, Scout Jamborees on the Air, World Scout Jamborees, National Jamborees and Pan-Pacific Jamborees. Amongst those in the Collection are Papua New Guinea's P29JOA (Jamboree on the Air), SK7JAM (Swedish special prefix), ZS4JAM from South Africa, Z27JAM from Zimbabwe, LX1JAM from Luxembourg, VE3WSJ (World Scout Jamboree from Canada, 9V1SJ (Scout Jamboree, from Singapore), 3B8SJ from Mauritius, OI3SUF (special prefix of the Scout Union of Finland) ZL4APJ from New Zealand's Asia-Pacific Jamboree of 1978 and ZL1PPJ (Pan-Pacific Jamboree held in Auckland in 1959) to mention just a few.

In Australia there is even a special callsign suffix allocation for both Scouts and Girl Guides. The prefix block SAA-SZZ is allocated to full licensees, but the suffixes SAA-SDZ are especially assigned to the Australian Scout Association. Likewise the GAA-GGZ prefix block has been assigned to the Girl Guides Association. The special S prefix enables Scout stations to be easily recognised and encourages Scout groups to use amateur radio as part of their activity programs.

AX2BSA

This QSL is one of several especially assigned calls to the Australian Boy Scouts

Association. The Jamboree of New Endeavour was held in Sydney in December 1970/January '71 and was the Ninth Australian Jamboree. The event was part of the bicentenary celebrations, Captain Cook having arrived at Botany Bay in 1770 in his ship "Endeavour". The call VK1BP has been mentioned previously. It is the callsign of the Scout Association's national HQ in Canberra, ACT. The special calls VK5BP and VK8BP are held by the Scout Association's HQ in South Australia and the Northern Territory respectively, whilst calls VK2SAA, VK4SAA and VK6SAA are held in other states. There are several other calls held by Scout Associations throughout Australia. The station VK5SJW operated during the World Jamboree of 1988/89 and the particularly attractive QSL VK4SAJ resulted from the 13th Australian Scout Jamboree of December '82/January '83 held at Ipswich, Queensland. In Australia even the individual Scout stations have, in most cases, been fortunate in obtaining an identifying suffix in their callsigns.

Examples include VK2SBB (Bunbury), VK2SCH (Heathcote, NSW), VK3SAC (Caulfield), VK3SBH (Box Hill), VK4SMM (Mount Morgan), VK5SMO (Moonta), VK6SCG (Scouts, Cubs, Guides) and VK7SCM (Cradle Mountain). All these QSLs have been donated to the WIA QSL Collection.

Space will not permit a full account of other aspects of the Scout Movement depicted on the QSL cards of amateur radio. Suffice it to say that especially allocated callsigns have been claimed by related groups such as Air Scouts (eg GB0GAS = Greenwich Air Scouts), Sea Scouts (eg GB0NSS = Nelson Sea Scouts), Bold Venture Scouts (eg GB2BVS), VK2GGL (Girl Guides) and Rover Scouts (eg VK5SRM, which operated during a Ranger Moot in January 1987).

For his services to the nation, the founder of Scouting was knighted in 1909 and raised to the peerage in 1929 taking the title "Lord Baden-Powell of Gilwell". The name Gilwell is a significant one for Scouts since it was in July 1919 that one of BP's hopes was realised, namely the establishment of a permanent training centre for Scout leaders. The site, named Gilwell Park, was in Epping Forest not far from London. In the following year, Baden-Powell was named Chief Scout of the World. After having witnessed the meteoric growth of scouting throughout the world, and the realisation of his life's work, Baden-Powell retired to Nyeri, Kenya where he died at the age of 83 on 8 January 1941. ar

CLUB CORNER

Riverland ARC Has Busy Time

A good attendance of Riverland Amateur Radio Club members for a working bee on Sunday, 2 December was held at the 2m repeater site to clean up the area and replace the transmit and receive antennas to increase the gain by about 3.5dB.

The 100ft tower was negotiated by Steve Seidel, the only one game enough to make the trip and see the view.

On Friday, 7 December, club members and their wives enjoyed an excellent meal for a Christmas get together at the Wunkar Golden Grain Tavern. Wunkar is a small wheat-growing town (well known for its silos) situated between Loxton and Swan Reach in the Murray Mallee.

A mini bus was used to convey members and their wives from Renmark, Berri and Loxton to the tavern. Ivan VK5PAW was our driver.

Perfect weather enabled three members and their wives, Kingsley Brauer VK5NOV and Maureen, Doug Tamblyn VK5PDT and Bev, and Peter Blades VK5APB and son Matthew to enjoy a barbecue picnic at Lake Cullulleraine with members of the Sunraysia Radio Group. For most it was a meeting for the first time. It is hoped that further meetings of the clubs will be held in 1991. Other members of the Riverland Club were unable to attend the picnic owing to last-minute commitments.

Lake Cullulleraine is situated approximately 38km west of Mildura on the Sturt Highway between Mildura and Renmark.

Club members send New Year's greetings to all readers of AR.

Doug Tamblyn VK5PDT
Secretary, Riverland ARC

Members of Riverland Amateur Radio Club working bee. Back row L to R John Crosier, Ivan Smith VK5PAW. David Wilson VK5NAP, John Ruston VK5ARK, Garry Watt VK5CWP, Front Row L to R Doug Tamblyn VK5PDT, Mike MacIntosh VK5KLG and Kingsley Brauer VK5NOU.

Air Forces Amateur Radio Net

At the annual meeting of the Air Forces Amateur Radio Net, Roy Mahoney VK4BAY was elected president; Bob Neville VK4KRN Hon Secretary; and Alan Cook VK3AUC Hon Treasurer. The net consists of serving and past members of Air Forces of the world resident in Australasia.

Net times: Southern group
Tuesdays 3610 +/- 1030Z *
Fridays 3605 +/- 0600Z
Northern group
Tuesdays 3567 +/- 1000Z*
* when daylight saving is in force less one hour

The Adastra Award is available to members, non-members and shortwave listeners.

Bob Neville VK4KRN,
124 Roscommon Rd,
Boondall, 4034

The West Coast Radio Group, Tas

The west coast repeater is situated on Mt Read. Mt Read is situated to the south of Rosebery, approximately 9km as the crow flies. The height is 1,050m or 3438.75ft. The tower is 30ft and the base is about 10ft below the top of the mountain. (The tower was standing at 1950 hours on 22/2/90). This will give the repeater good coverage of the west coast and, hopefully, a large slice of Tasmania not covered by the other repeaters in the state.

The members of the west coast radio group are as follows: VK7NBU Bob, VK7KVB Dick, VK7NDH Dale, Beverly — Dale's better half, VK7PL Peter, VK7ZMR Maurice, VK7ADC Darby, VK7ZBT Greg, David Spicer and VK7BV Terry.

The repeater frequency is 147.075MHz with a + offset of 600kHz. The repeater was converted by Dick VK7KVB from a Plessey MPR43, and the final line-up was performed by Noel VK7KNS of VK Electronics in Burnie. The help given by Noel is very much appreciated by the group.

The group has also installed a UHF CB on the site; this was also converted from a commercial rig by Dick (Philips 828). This has given a few headaches due to a fault in the original set-up of the radio. This repeater will add to the coverage of the CB repeaters in Tasmania and to the safety of motorists and bush-walkers in the state. Work will continue on the site by the members on the west coast, and I am sure Dale will continue time out with his usual short overs. He was the first, and that happened at 1646 on 19/7/90. The antenna at present is not complete, and it is hoped that at some future date, if funds are available, a set of cavities will be installed. But at present that is not possible, as the separation required from the filters is greater than the normal 85dB and will cost over $3000, which is not available at present. But we may strike it lucky in the future. Several stations from across the water have made contact with members and other amateurs during the openings over the past few weeks. Others have triggered it but have not had a reply, as there are not many amateurs on the west coast. We are aware that this has happened due to the comments on other bands and repeaters, so don't give up; you will make contact in due time. If anyone requires more information, please contact one of the members of the group, and if it is about the conversion, Dick is the best one for that. We wish and all the compliments of the season, and may 1991 bring you all peace of mind and good health.

VK7BV TERRY MCMULLEN ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

It has taken me much longer than usual to read the December issue of Amateur Radio because my time has been taken up trying to work out the time from the VNG time signal transmissions. The absurdly complicated method of telling the time from VNG is spelt out in the article "VNG - HOW TO USE IT". All that is required is a PhD in mathematics, a computer, and a lot of spare time. However the article sensibly states "It is a good idea to have a timepiece which shows the correct time - so that you will have a fair idea of what the time should be when you are dividing the minute, day and hour sections, until you feel confident that you can get it right" In other words, to tell the time from VNG you need a good clock!

VNG should get off the air, or at least stop blocking WWV transmissions where they have the old fashioned method of simply telling you the precise time.

DR S. BOCKNER VK5VN
ATKINSON RD
CRAFERS 5152

I was not going to renew for 1991 but after seeing the article "A Japan Odyssey" I changed my mind.

Life is getting a bit too "high tech" for me nowadays. I am trying to fathom the mysteries of UNIX on my 286/12 computer, but sometimes I feel like selling all the high tech gear and going fishing.

The story in today's "Australian" about "(mixed up) materials engineering" was good reading. but your story on Japan was very good.

My thanks to Terry Robinson VK3DWZ.

JON KITCHIN VK6TU
10 PHILLIP WAY
OSBORNE PARK 6017

Value of AR

In response to the request for members' opinions regarding technical articles (AR Nov '90) I humbly suggest that a major reason for Amateur Radio's existence is construction, experiment and learning. Publication of technical articles creates incentive for this as well as helping younger amateurs acquire knowledge. How can we deserve our band allocations if we become a bunch of CB type operators? I should like to see more technical articles if that were possible; and by the way congratulations to Drew Diamond for his first rate construction designs, also to those responsible for a jolly good magazine.

MURRAY YOUNG VK4GH
36 RAINTREE BLVD
CALOUNDRA 4551

AR to be Study Guide?

With interest I have followed comments about articles in AR. Let's start at the beginning! To recruit new members to WIA it is imperative to start publishing articles for beginners, corresponding to the Novice exam syllabus, so that beginners such as myself benefit both by WIA membership and in the long run by using previous issues as a reference guide! Sometimes, listening to various hams, I hear gurgle-squawk-whistle-squeak etc, which makes me wonder what are their technical qualifications? I am a beginner, oscillating in my ignorance, showing capacity to learn, and yet resistance is there! That is to say, resistance by possible helpers to teach us properly from the start! I was fortunate, having been an Air Force radio storeman, to learn a few things relating to spare parts etc.

But those with no experience would need a long time to prepare for the exam! I won't do the exam until I am 100% ready for it! So I need adequate tuition and material to prepare me. Parrot learning is out! Practical use of theory and experiment is a must! Could we see soon in AR "Electrical Laws and Circuits", diagrams etc, all the way to readiness for NAOCP exam?

PLEASE!

VICTOR ABIANAC QDF581
1/222 AGNES ST
ROCKHAMPTON 4700

(We agree with your description of the problem, Victor. Our problem is that someone must write the material for us to publish. Any volunteers? Ed)

Code Speed

Reading the December Pounding Brass Gil VK3CQ would like novice code speed increased from 5wpm to 10wpm. I am strongly opposed to this. There are too many disabled people on the bands and this would upset many of them.

When I started in 1980 as a novice I made 11,000 contacts on SSB. As I only number my 28MHz logbook I now have well over 52,000 contacts on this band.

In 1953, as a member of the Radio Society of WA, I could do 16wpm CW. In 1979, when I decided to go back to radio, I found that I could not even pass 5wpm due to disablement. I finally got my 10wpm in 1982 after a lot of help from old man Hok 9M2FR. I sat eight hours a day for many months just listening to the sound which I knew so well, but could not handle. When I finally managed the sound I could not write fast enough due to disablement. I love CW, but that does not mean that I or anybody else has the right to set a standard for CW to keep people off the band.

JOHN VOGEL VK6BA
6 BRAND ST
CLOVERDALE 6105

Morse Code
A Reply to VK5KIR

My article published in Pounding Brass was originally published in a club magazine in reply to a New Zealand anti-CW lobby group.

Regulations prevent people, like Ian, who suffer a disability, being handed out an AOCP over the counter for obvious reasons which do not require explanation. The ITU demands certain standards and, fortunately, it is still a basic provision that a candidate must satisfy DoTC of his or her ability before a licence is issued. People with impaired sight have to satisfy this requirement. It would be unfortunate for amateur radio if a licence was issued on the production of a medical certificate no *matter* what our personal compassionate thoughts may be.

Ian suggests that there are many brilliant people. No doubt they are satisfied with the standard they have reached. There are others who just don't want to make the effort and want the standards changed to suit.

As a long-standing member of the WIA and an active amateur for 52 years operating all modes, I think this qualifies me to make an assessment.

In conclusion, stick with it Ian, you have only 5wpm to go.

PETER ALEXANDER VK2PA
NANDARI
ROLLANDS PLAINS
VIA TELEGRAPH POINT 2441

More Morse

VK3TFN, wonderful idea, re-examination of radio amateurs' Morse ability. I agree, and there will be thousands joining me. Those who fail will help populate the unused repeaters and VHF/UHF frequencies. It is obvious that Graham, like many, does not realise that Morse is a common language and, once mastered at the communication level (10wpm or better) has no restrictions, no accent. Surprisingly enough, a CW operator does not have to be conversant in Japanese and Esquimaux or any other language to world over, hence one of the many positive arguments for its retention. I will agree that many amateurs study Morse only to obtain an AOCP. Re-examination will certainly sort the men from the boys.

To deny unqualified operators access to the HF bands is neither selfish nor discriminatory (IRR 1563). An interesting point: the lobby group against Morse code seems to come from these people who have never taken time out to learn it or use it. Are they qualified to make an assessment?

The ball is in your court as it would be with many people who want to qualify for a full call.

PETER ALEXANDER VK2PA
NANDARI
ROLLANDS PLAINS
VIA TELEGRAPH POINT 2441

Yet More Morse

It would take more than 200 words to explain to Mr Jackson VK3TFN why CW is still the number-one communication mode, and still the fastest "for all seasons". At present you have to pass the test, or else you do not get a full call. This does not make you a CW operator. You only become one of the elite band after years of practice. When you do master Morse code a whole new world of communications opens up for you, instead of just giving a contact and weather report, as is the case of a big percentage of contacts. Many more people would like to learn CW, but will not put their brains to it and learn or operate the code. Black boxes and the demise of proper written examinations have made things easy enough these days, but a CW pass is still a topic on air which gives the person concerned reason to boast and feel he is on his way to becoming a fully fledged "ham".

To Mr Ritson, AR Dec VK5KIR. Congratulations on passing the test in code — as you were required to do for an amateur licence. Now use it, stop whingeing, come down on 40MX and send some dots and dashes and feel you are doing some real hamming(!!!) with Peter and myself.

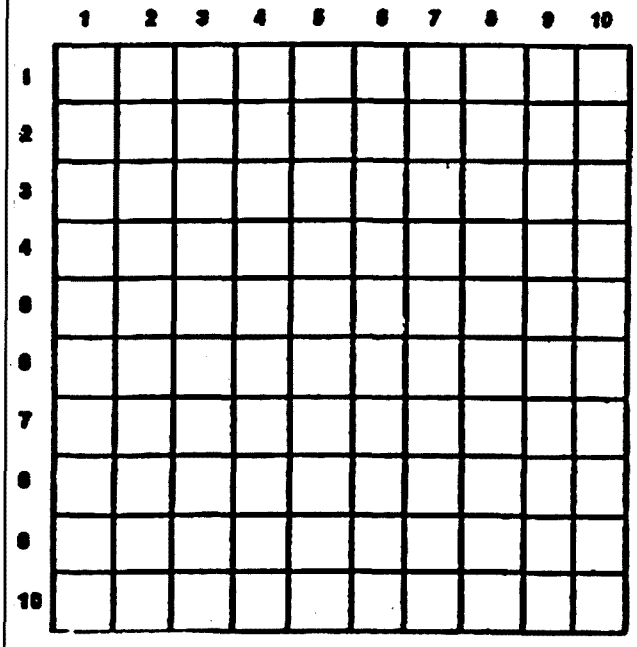
G W LANYON VK2AGL
16 RILTON AVE
ROSELANDS 2196

(K CALLS CAN'T USE 40 METRES!!! ED)

More Morse Again!

Graham Jackson VK3TFN puts forward the same fallacious arguments as the rest of

Morseword No 47



Across
1 Aching
2 Fastener
3 Begin
4 Seep Out
5 Silly
6 Inlet
7 Spouse
8 He goes to court
9 Sins
10 Staya flat

Down
1 Taxes
2 Stadium
3 Ramble
4 Greek letter
5 Platform
6 Emperor
7 Urn
8 N.S.W. inland town
9 Genuine
10 Atoms

Audrey Ryan © 1990

Solution Page 56

the anti-CW lobby.

His inane statement that CW is not now an essential part of amateur radio is not borne out by the facts. He should monitor all amateur bands, do an honest count of amateur contacts worldwide and he will find that some 60 per cent are conducted in Morse code. The reasons for this are:

a) language difficulties where speech is concerned;
b) the high cost of equipment in less affluent countries has led to simple solid-state CW rigs;
c) the often proven fact of the superior performance of CW under poor conditions;
d) the ability to copy distress calls in Morse should be essential for all radio operators.

His ridiculous statement concerning foreign languages and distress signals is evidence that Graham should be re-examined for his lack of knowledge of distress regulations.

'Mayday' (M'aidez), 'securite' and 'Q code' signals are international and understood in all languages. I have taught handicapped persons Morse and many have attained unrestricted qualifications.

Less whingeing, more effort, plus good instruction will bring qualifications which make the complete amateur radio operator.

Even astronauts and aircraft pilots must learn Morse.

TED GABRIEL VK4YG
PO Box 245
RAVENSHOE 4872

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr L A Lawson	VK2IX
Mr Dennis King	VK2ZM
Mr Joe Baker	VK2BJX
Mr Ron Higginbotham	VK3RN
Mr J P Wain	VK3BJO
Mr Ian Morris	VK3ELS
Mr T K Long	VK3ZFL
Mr Andy Thompson	VK4AT
Mr Les Eliason	VK4EH (ex 3ALE)
Mr R F Crowell	VK6LY
Mr J M Denny	VK6YD
Mr M J (Barney) Watson	VK7BA

A J C Thompson (Andy) VK4AT

I sadly report the passing of Andy VK4AT on 24 November 1990 at the Logan Nursing Home, Brisbane. Andy was 93 years old and died peacefully in his sleep. Until his retirement Andy was a dairy farmer in the Pomona district, and later at Gympie. He was a great experimenter in the antenna field and, on his retirement, lived with his daughter, Nancy, at Loganlea, Logan City. Andy served in the army in World War One. Sadly missed by all his mates and family.

F T LUBACH VK4RF

Dennis King VK2ZM

Dennis passed away on 14 December 1990 in Orange Hospital after a short illness. He was 73 years old.

Dennis made it to the top in three careers — music, newspapers and theatre. First and foremost he was a musician, a banjo and guitar player second to none, playing at the Sydney Trocadero, on the Colgate Coast-to-Coast Radio Show and with the ABC Show Band.

At mid-life he entered the newspaper business, managing the Blacktown Advocate, and then theatres, becoming the Sydney Area Manager for Greater Union.

He held an interest in radio for many years, joining the WIA in 1975. His earlier callsigns were VK2NNJ and VK2AOO.

Dennis retired to Gunderman on the Hawkesbury, then shifted to Blayney, Orange and Blackheath, and then finally was attracted back to Orange to end his days.

He leaves behind Lola, his wife of 41 years, and will be sadly missed by all who knew him on the air. But to many Dennis will be remembered as "Master of the Guitar, King of the Trocadero".

WESTLAKES AMATEUR RADIO CLUB

L B (Jock) Fisher VK1LF

"Jock" died from cancer on 16 September 1990, aged 74 years.

He came to Australia from Scotland in 1945 and served in various government departments, specialising in naval electrical engineering. He retired from the Navy Department in 1977.

Jock was an active radio amateur, holding licences in UK and Australia. In addition to his amateur activities he restored old radio sets. He was a director of the Canberra Burns Club, a member of the Lions Club and of the Committee of the Goodwin Retirement Village, where he lived.

For many years, Jock played a significant part in the JOTA days at Government House, Canberra.

73 OM, FRANK DOHERTY VK1XE

Roar Hopes To Expand

ONE OF FIRST WORLDWIDE fellowships of Rotary International is ROAR - Rotarians of Amateur Radio. An article by David Portley VK4DP in "Rotary Down Under" matazine says efforts are being made to expand ROAR in the South Pacific - Australia and New Zealand in particular.

Members of many Rotary clubs are already involved in the Australian section of ROAR. These include those at Port Pirie and Murray Bridge (SA) Keilor,k Ringwood, Balwyn and Bendigo (Vic), Wanneroo (WA), Rockhampton South (Qld), Launceston North (Tas), and in NSW - Newcastle, Wagga Wagga, and Albury.

ROAR "Down Under" runs a net on 14.293 MHz at 1000 UTC on the first Sunday of every month and invites fellow rotarians to join in.

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

February Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST. Covers the major part of NSW and Queensland.

VK SOUTH. Covers southern-NSW, VK3, VK5 and VK7.

VK WEST. Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world. To Europe, long path predictions are given in lieu of the short path, as the former is open at more reasonable hours.

The charts explained

These charts are different to those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 uV/metre (dBU). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands.

The numbers in the column represent predicted field strength at each hour in decibels referred to 1 uV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 uV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvements. Where conditions warrant it, I have include predictions for the bands below 14 MHz, deleting the upper bands.

Ten Metres

The predictions look a little pessimistic for ten metres, but it only takes a slight "lift" in conditions to provide openings on this band. Keep a watch on the short-term geomagnetic and propagation forecasts, which are broadcast by WWV and Radio Australia, or obtainable from the IPS recorded message service on (02) 414-8330.

Broadcasts

The VK2WI and VK3WI Sunday broadcasts carry propagation predictions; for the bands 14 MHz and above listen on the last Sunday of the month for the month ahead, and for the bands 1.8 to 10 MHz, listen on the first Sunday of the month for that month. Often, special predictions covering current or upcoming DXpeditions will be included, so keep a listen out.

VK EAST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.9	-16	11.3	-18	-11	-12	-19	-28
2	12.8	-29	9.8	-22	-15	-16	-23	-34
3	12.4	-36	9.5	-25	-16	-17	-23	-32
4	15.7	-26	12.2	-34	-19	-15	-16	-22
5	21.9	-14	16.9	...	-23	-15	-11	-12
6	28.3	-7	21.7	...	-28	-16	-9	-7
7	31.3	-4	24.3	...	-29	-16	-8	-4
8	30.2	-3	24.4	...	-26	-14	-7	-3
9	28.9	-2	23.4	...	-20	-10	-4	-2
10	27.4	-1	22.1	-33	-12	-5	-1	-1
11	25.9	2	20.8	-19	-4	1	2	0
12	24.5	5	19.6	-5	4	6	4	1
13	23.9	8	19.0	7	11	10	7	2
14	23.2	11	18.4	16	16	13	8	2
15	22.4	13	17.6	22	19	15	8	1
16	21.2	14	16.5	23	19	14	6	-2
17	20.1	15	15.6	24	18	12	4	-6
18	18.8	15	14.5	23	17	10	0	-11
19	17.8	16	13.6	22	15	7	-3	-15
20	18.2	16	13.8	23	16	9	-2	-14
21	20.8	12	15.6	20	16	11	3	-7
22	19.2	8	14.5	10	9	5	-3	-12
23	17.9	2	13.5	0	2	-1	-8	-18
24	16.8	-5	12.6	-10	-5	-7	-13	-22

VK STH - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.1	-9	12.2	-13	-7	-9	-16	-26
2	13.6	-22	10.4	-20	-14	-16	-23	-34
3	12.9	-31	9.9	-24	-16	-17	-23	-33
4	16.5	-22	12.8	-33	-18	-14	-16	-21
5	23.2	-11	17.9	...	-23	-14	-10	-11
6	28.7	-6	23.0	...	-29	-16	-9	-6
7	28.6	-7	23.3	...	-30	-17	-9	-7
8	28.1	-7	22.9	...	-29	-16	-9	-7
9	27.3	-6	22.2	...	-25	-14	-8	-6
10	26.0	-5	21.0	...	-19	-10	-6	-5
11	24.3	-4	19.6	-30	-12	-6	-4	-5
12	22.5	-2	18.0	-17	-5	-2	-3	-6
13	20.6	2	16.5	-3	2	2	-3	-9
14	19.4	7	15.4	9	8	4	-3	-12
15	18.3	11	14.5	18	12	5	-5	-17
16	17.4	13	13.7	18	11	3	-8	-21
17	16.8	13	13.1	19	10	2	-11	-25
18	16.0	14	12.3	18	9	-1	-15	-30
19	15.4	14	11.7	17	7	-4	-18	-35
20	15.0	14	11.3	16	5	-5	-21	-38
21	16.0	13	11.9	16	8	-2	-15	-30
22	18.3	10	13.5	14	10	4	-6	-17
23	20.2	6	15.1	8	8	5	-2	-11
24	18.4	0	13.8	-4	0	-3	-9	-18

VK WEST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.6	0	12.6	-1	-2	-7	-16	-28
2	13.9	-13	10.7	-12	-11	-16	-26	-39
3	13.2	-23	10.2	-19	-15	-18	-27	-40
4	16.9	-17	13.1	-26	-15	-13	-16	-23
5	23.9	-8	18.4	-38	-17	-10	-8	-10
6	30.8	-4	23.6	...	-22	-12	-6	-4
7	31.6	-3	24.9	...	-25	-13	-6	-3
8	31.3	-3	24.5	...	-25	-13	-6	-3
9	30.7	-3	24.7	...	-23	-12	-5	-3
10	29.6	-3	24.1	...	-19	-10	-4	-2
11	28.3	-1	23.4	-34	-13	-5	-2	-1
12	26.7	1	21.5	-19	-4	1	2	0
13	25.1	4	20.2	-3	5	6	4	0
14	23.6	8	18.8	11	12	11	6	0
15	22.8	11	18.1	21	18	14	7	0
16	22.1	12	17.5	23	19	14	6	-2
17	21.3	13	17.3	24	19	13	5	-4
18	20.3	13	15.8	24	18	11	2	-8
19	19.3	14	15.0	23	16	9	-1	-12
20	18.2	14	14.0	22	14	6	-5	-17
21	17.4	14	13.2	20	12	4	-8	-22
22	18.0	14	13.6	21	14	6	-6	-18
23	20.6	11	15.7	21	16	10	1	-9
24	19.0	6	14.3	10	7	2	-6	-17

VK EAST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.8	-26	9.7	-20	-14	-16	-22	-32
2	12.8	-22	9.7	-17	-13	-16	-24	-35
3	12.7	-17	9.8	-13	-12	-16	-25	-38
4	12.0	-14	9.3	-10	-12	-19	-31	...
5	11.1	-12	8.6	-8	-14	-23	-38	...
6	11.3	-4	8.9	-4	-13	-23	-40	...
7	13.4	5	10.7	4	-4	-13	-28	...
8	17.6	8	14.0	12	7	1	-9	-21
9	20.2	8	15.4	9	10	7	2	-5
10	19.3	1	14.6	-6	0	0	-3	-9
11	19.6	-7	15.6	-20	-9	-6	-8	-12
12	18.5	-14	14.7	-31	-15	-11	-11	-15
13	17.6	-21	14.2	-38	-20	-14	-13	-16
14	16.9	-26	13.2	...	-22	-16	-14	-17
15	16.1	-31	12.4	...	-23	-17	-15	-18
16	15.3	-36	11.7	...	-23	-17	-15	-18
17	15.0	-37	11.3	...	-23	-17	-16	-18
18	15.9	-34	11.8	...	-24	-17	-15	-17
19	18.2	-25	14.4	...	-26	-18	-14	-15
20	21.4	-17	16.6	...	-27	-18	-13	-13
21	18.5	-21	14.3	...	-22	-16	-14	-16
22	16.0	-25	12.3	-34	-18	-15	-15	-20
23	14.3	-27	10.9	-28	-16	-15	-18	-24
24	13.3	-28	10.1	-23	-15	-15	-20	-29

VK STH - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.5	-27	9.5	-20	-15	-17	-24	-35
2	12.5	-23	9.6	-17	-14	-18	-26	-39
3	12.4	-18	9.6	-13	-13	-18	-29	...
4	11.6	-15	9.1	-11	-14	-22	-35	...
5	10.8	-12	8.4	-9	-17	-28	...	...
6	10.9	-6	8.6	-7	-16	-29	...	...
7	12.7	4	10.1	2	-8	-19	-36	...
8	16.2	7	12.9	10	3	-4	-16	-30
9	20.4	7	15.0	13	11	6	-2	-11
10	19.6	5	13.7	5	6	3	-3	-11
11	17.4	-1	12.7	-5	-1	-3	-8	-16
12	17.1	-9	11.8	-16	-8	-8	-12	-20
13	16.1	-18	11.4	-26	-14	-12	-15	-21
14	15.5	-26	10.7	-32	-18	-14	-16	-21
15	14.6	-32	10.2	-35	-19	-15	-16	-21
16	14.1	-37	9.9	-37	-20	-16	-16	-21
17	13.9	...	9.8	...	-25	-20	-21	-25
18	14.8	-37	10.5	...	-22	-17	-16	-19
19	16.8	-30	11.6	...	-24	-17	-15	-17
20	19.9	-21	14.2	...	-27	-18	-14	-14
21	17.5	-25	13.7	...	-23	-16	-15	-17
22	15.2	-29	11.8	-35	-19	-15	-16	-21
23	13.8	-31	10.6	-29	-17	-15	-18	-25
24	12.8	-31	9.8	-24	-15	-16	-21	-30

VK WEST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	12.3	-39	9.4	-27	-18	-18	-23	-31
2	12.3	-35	9.5	-25	-18	-19	-25	-34
3	12.1	-31	9.4	-22	-17	-20	-27	-38
4	11.5	-30	8.9	-19	-17	-22	-31	...
5	10.6	-29	8.3	-17	-18	-25	-38	...
6	10.7	-23	8.4	-15	-18	-27	-40	...
7	12.4	-12	9.8	-10	-14	-21	-34	...
8	15.6	-4	12.4	-4	-6	-11	-20	-32
9	19.5	0	15.6	1	2	-2	-8	-17
10	22.3	3	17.3	3	6	4	0	-6
11	18.4	-1	14.2	-4	-1	-3	-8	-15
12	17.1	-8	13.1	-14	-7	-8	-12	-19
13	18.2	-13	14.5	-25	-14	-11	-13	-18
14	17.1	-22	13.5	-34	-19	-15	-16	-20
15	16.2	-29	13.0	-39	-22	-17	-17	-21
16	15.5	-34	12.1	...	-24	-18	-18	-21
17	14.7	-39	11.3	...	-24	-19	-18	-22
18	14.2	...	10.8	...	-27	-22	-21	-25
19	13.9	...	10.4	...	-29	-24	-24	-28
20	14.8	-39	11.0	...	-24	-19	-18	-21
21	16.8	-31	13.2	...	-26	-20	-18	-20
22	14.9	-36	11.6	-40	-23	-18	-18	-22
23	13.5	...	10.4	-39	-24	-21	-23	-29
24	12.5	...	9.7	-35	-23	-21	-25	-32

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.1	-8	11.9	-13	-7	-8	-13	-22
2	19.3	-7	14.2	-20	-8	-6	-8	-13
3	19.1	-11	14.5	-27	-12	-9	-9	-13
4	21.7	-9	16.3	-36	-16	-10	-8	-9
5	26.5	-6	18.6	...	-19	-11	-7	-7
6	27.2	-6	19.0	...	-21	-12	-7	-6
7	27.2	-6	19.1	...	-21	-12	-7	-6
8	27.3	-6	19.1	...	-19	-11	-6	-6
9	26.0	-5	19.0	-36	-15	-8	-5	-6
10	24.3	-4	19.0	-28	-11	-6	-4	-6
11	22.5	-4	18.0	-20	-7	-4	-4	-8
12	20.7	-2	16.5	-12	-3	-2	-5	-11
13	19.5	0	15.4	-5	0	-1	-6	-13
14	18.4	4	14.5	3	4	1	-7	-16
15	17.5	8	13.8	11	7	2	-8	-19
16	16.8	11	13.1	15	9	1	-10	-23
17	16.0	13	12.3	16	8	0	-13	-27
18	15.3	14	11.7	16	7	-2	-16	-32
19	15.0	15	11.2	17	7	-4	-18	-34
20	15.7	14	10.8	18	8	-2	-15	-31
21	14.9	10	10.2	11	3	-6	-20	-35
22	14.4	3	9.9	3	-2	-10	-22	-37
23	14.1	-3	9.8	-3	-5	-12	-23	-37
24	15.0	-7	10.5	-8	-6	-10	-19	-30

VK STH - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.2	-5	11.2	-8	-6	-9	-17	-28
2	18.6	-4	13.7	-12	-5	-5	-9	-17
3	18.4	-8	13.9	-19	-9	-7	-10	-15
4	20.9	-8	15.7	-27	-12	-8	-7	-11
5	24.9	-6	17.8	-34	-15	-8	-6	-8
6	25.2	-7	17.9	-37	-16	-9	-7	-8
7	25.0	-7	17.7	-38	-17	-10	-7	-8
8	24.7	-7	17.5	-36	-16	-10	-7	-8
9	23.7	-7	16.9	-33	-15	-9	-7	-9
10	22.3	-7	15.7	-26	-11	-7	-7	-11
11	20.5	-7	14.4	-20	-8	-6	-9	-14
12	18.8	-6	13.1	-14	-6	-6	-11	-18
13	17.4	-4	12.1	-7	-4	-7	-13	-23
14	16.2	0	11.2	-1	-2	-7	-17	-29
15	15.3	5	10.8	6	0	-8	-21	-36
16	14.7	9	10.2	10	1	-9	-24	...
17	13.8	11	9.6	10	-1	-13	-30	...
18	13.5	12	9.5	11	-2	-15	-33	...
19	13.3	13	9.3	11	-3	-16	-35	...
20	14.2	14	10.0	13	1	-11	-28	...
21	14.1	12	9.8	11	0	-11	-28	...
22	13.7	6	9.6	5	-4	-14	-30	...
23	13.4	0	9.5	-1	-7	-16	-30	...
24	14.4	-4	10.2	-4	-6	-13	-25	-39

VK WEST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.1	4	12.8	4	3	-2	-10	-21
2	19.4	2	14.7	-2	2	0	-5	-12
3	22.0	1	17.3	-10	-1	1	-1	-6
4	27.1	1	20.7	-20	-5	0	2	0
5	29.3	-1	21.7	-27	-9	-2	0	0
6	29.3	-2	24.1	-32	-12	-4	-1	-1
7	28.9	-2	23.7	-34	-13	-5	-2	-2
8	28.8	-2	23.5	-34	-13	-5	-2	-2
9	28.3	-2	23.0	-32	-12	-5	-2	-2
10	27.5	-2	22.3	-27	-10	-3	-1	-2
11	26.2	-1	21.6	-20	-6	-1	0	-3
12	24.5	0	19.7	-11	-1	1	0	-4
13	22.6	3	18.1	-2	4	4	0	-6
14	20.8	6	16.6	7	8	5	-1	-9
15	19.6	9	15.5	15	11	6	-2	-13
16	18.5	12	14.6	19	13	6	-5	-16
17	17.6	13	14.2	19	12	4	-7	-20
18	17.0	14	13.2	20	11	2	-10	-24
19	16.2	15	12.5	19	10	0	-13	-28
20	15.5	15	11.9	18	8	-2	-17	-33
21	15.2	15	11.5	18	7	-4	-18	-35
22	16.2	15	12.1	19	10	0	-13	-29
23	16.6	13	12.7	18	10	2	-10	-24
24	16.2	8	12.3	10	5	-2	-13	-26

VK EAST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.8	13	18.6	7	14	15	12	8
2	24.9	13	20.6	8	14	15	13	8
3	24.6	13	20.2	9	15	15	13	8
4	24.3	14	19.9	12	17	16	13	8
5	23.8	15	19.4	15	18	17	13	7
6	22.9	17	18.6	21	21	19	14	6
7	21.8	20	18.1	29	26	21	14	5
8	20.6	22	16.7	31	26	20	12	2
9	19.4	22	15.6	31	25	18	8	-3
10	18.2	23	14.6	30	23	15	5	-8
11	17.6	23	14.0	30	22	14	2	-10
12	17.0	24	13.5	29	21	12	0	-13
13	16.3	24	13.2	28	19	9	-4	-17
14	15.4	24	12.1	27	17	6	-8	-23
15	14.6	24	11.4	25	14	3	-12	-28
16	13.8	25	10.6	23	11	-1	-17	-35
17	13.1	25	10.0	22	8	-5	-22	...
18	13.5	23	10.2	21	9	-3	-19	-37
19	15.4	17	11.8	18	12	3	-9	-23
20	18.8	14	14.3	15	15	10	2	-7
21	21.7	13	16.8	12	15	14	9	2
22	23.3	13	18.3	10	15	15	11	5
23	23.8	13	19.1	8	14	14	11	6
24	24.5	13	19.7	7	14	14	12	7

VK STH - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.0	4	21.0	-1	7	8	5	1
2	25.9	4	21.4	0	7	8	6	1
3	25.9	5	21.3	1	8	9	6	1
4	25.6	5	20.9	4	10	10	6	1
5	25.4	6	20.8	8	12	11	7	1
6	25.0	8	20.3	14	15	13	8	1
7	24.3	10	19.7	22	20	16	9	1
8	23.1	13	18.7	28	23	17	8	-2
9	21.6	13	17.4	28	21	14	4	-7
10	20.0	14	16.1	27	19	11	-1	-14
11	18.4	15	14.7	25	16	6	-7	-22
12	17.4	15	13.8	24	13	3	-12	-28
13	16.5	15	13.1	22	10	-1	-17	-35
14	15.7	16	12.4	20	8	-5	-22	...
15	15.1	16	11.8	19	5	-8	-26	...
16	14.4	16	11.1	17	2	-12	-31	...
17	13.7	16	10.5	15	-1	-16	-37	...
18	13.4	15	10.1	12	-3	-18	-40	...
19	14.2	7	10.6	7	-3	-14	-32	...
20	16.2	3	12.0	4	1	-7	-19	-34
21	19.7	3	14.8	3	5	1	-6	-17
22	22.7	4	17.4	2	7	6	1	-7
23	24.7	4	19.2	0	7	7	4	-2
24	25.4	4	20.2	-1	7	7	5	-1

VK WEST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.8	-1	20.5	-19	-5	-1	-1	-4
2	26.3	-1	21.3	-19	-5	-1	0	-3
3	26.3	-1	19.6	-18	-4	0	0	-3
4	26.3	0	21.6	-16	-3	1	1	-2
5	25.9	1	21.2	-12	0	2	1	-2
6	25.7	2	21.0	-5	4	5	3	-1
7	25.2	5	20.6	4	9	9	5	-1
8	24.3	8	19.7	14	15	12	7	0
9	22.8	10	18.3	21	18	13	6	-3
10	21.2	12	17.0	24	18	12	3	-7
11	19.6	13	15.7	23	17	9	-1	-13
12	18.5	13	14.8	23	15	6	-6	-19
13	17.5	14	14.0	22	13	4	-9	-24
14	16.7	15	13.2	21	11	1	-13	-29
15	15.9	15	12.9	19	9	-2	-17	-34
16	15.3	15	12.0	18	7	-5	-20	-38
17	14.7	16	11.4	17	5	-8	-25	...
18	14.0	15	10.7	14	2	-11	-29	...
19	13.7	8	10.4	7	-3	-14	-30	...
20	14.5	1	10.9	2	-3	-11	-25	...
21	16.6	-2	13.1	-4	-3	-7	-16	-27
22	20.1	-2	15.2	-9	-2	-3	-7	-15
23	23.2	-1	17.8	-13	-3	-1	-3	-8
24	25.1	-1	19.6	-17	-4	0	-1	-5

VK EAST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.1	-6	19.7	-40	-17	-10	-6	-7
2	23.8	-6	18.0	-29	-12	-7	-6	-8
3	21.6	-5	16.2	-19	-7	-5	-6	-11
4	19.5	-3	14.7	-9	-3	-4	-8	-16
5	18.2	1	13.6	-1	1	-3	-10	-20
6	17.1	5	12.8	7	3	-3	-13	-26
7	16.3	10	12.4	14	6	-3	-16	-31
8	15.6	11	11.7	14	5	-5	-20	-36
9	15.0	12	11.3	14	3	-8	-23	...
10	13.6	13	10.4	12	-2	-15	-33	...
11	12.1	14	9.3	7	-9	-25	...	...
12	12.0	14	9.3	7	-10	-26	...	...
13	14.9	13	11.1	15	3	-8	-24	...
14	19.5	12	15.0	21	15	9	-1	-11
15	17.4	7	13.5	9	6	1	-8	-19
16	18.5	2	14.2	-1	2	-1	-7	-15
17	17.3	-6	13.2	-13	-6	-6	-11	-19
18	17.5	-13	13.3	-24	-12	-10	-12	-18
19	20.0	-12	15.7	-34	-16	-11	-10	-13
20	24.5	-9	18.7	...	-22	-13	-8	-8
21	28.2	-6	21.9	...	-26	-14	-8	-6
22	28.6	-5	22.3	...	-27	-15	-8	-5
23	28.8	-6	21.9	...	-26	-14	-8	-6
24	28.1	-6	21.3	...	-22	-13	-7	-6

VK STH - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.9	-5	20.3	...	-18	-10	-6	-6
2	24.9	-4	18.8	-30	-12	-6	-4	-6
3	23.0	-3	17.3	-19	-6	-3	-4	-8
4	21.2	-1	15.9	-9	-2	-1	-5	-11
5	20.0	2	15.0	-1	3	1	-5	-13
6	19.0	5	14.2	7	6	1	-7	-17
7	18.1	8	13.8	13	8	2	-9	-21
8	17.0	11	12.8	16	8	0	-13	-27
9	16.1	12	12.2	16	6	-3	-17	-33
10	14.4	13	11.0	13	1	-11	-28	...
11	12.6	13	9.6	8	-7	-22	...	...
12	12.2	13	9.5	7	-9	-24	...	...
13	15.3	13	11.4	16	5	-6	-22	-39
14	17.0	11	13.3	16	9	1	-10	-24
15	16.2	4	12.5	5	2	-4	-15	-27
16	15.5	-5	11.8	-7	-5	-9	-18	-29
17	15.1	-15	11.4	-17	-11	-12	-19	-28
18	16.0	-19	11.9	-26	-14	-13	-16	-23
19	18.3	-17	14.4	-35	-18	-13	-13	-17
20	22.3	-13	16.7	...	-23	-14	-11	-11
21	25.8	-9	19.7	...	-26	-15	-10	-8
22	28.0	-7	21.8	...	-28	-16	-9	-7
23	28.9	-6	22.8	...	-27	-15	-8	-6
24	28.7	-6	21.8	...	-24	-13	-7	-6

VK WEST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.3	-7	19.8	...	-24	-14	-8	-6
2	23.9	-8	18.0	...	-19	-11	-7	-7
3	21.5	-8	16.2	-34	-15	-9	-7	-9
4	19.4	-8	14.5	-23	-10	-7	-8	-13
5	18.0	-6	13.5	-15	-6	-6	-9	-16
6	16.9	-3	12.6	-8	-3	-5	-11	-20
7	16.2	1	12.2	0	0	-4	-13	-25
8	15.5	5	11.6	6	2	-5	-16	-29
9	15.0	11	11.3	12	4	-5	-19	-35
10	13.7	13	10.4	12	1	-11	-28	...
11	12.2	14	9.3	9	-5	-20	-40	...
12	12.1	16	9.3	10	-5	-20	...	...
13	15.0	16	11.2	18	7	-4	-19	-36
14	18.9	15	15.0	22	16	10	1	-10
15	18.1	10	14.7	12	10	5	-3	-14
16	17.5	4	13.7	2	4	0	-7	-16
17	16.8	-4	13.0	-9	-3	-4	-10	-18
18	16.0	-12	12.2	-18	-9	-8	-13	-20
19	15.6	-20	11.8	-26	-13	-11	-14	-20
20	16.5	-21	12.4	-34	-17	-12	-13	-17
21	19.0	-18	15.0	...	-21	-14	-11	-13
22	23.1	-12	17.5	...	-27	-16	-10	-9
23	26.7	-8	20.6	...	-30	-17	-9	-7
24	28.4	-6	21.5	...	-29	-16	-9	-6

VK EAST - USA/CARRIBBEAN

VK STH - USA/CARRIBBEAN

VK WEST - USA/CARRIBBEAN

APOGEE ARTS

TRADE ADS

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution shortwave weather fax, Morse & RTTY receiving program. Needs GCA, SSB hf radio & RADFAX decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2 but suitable for Hercules, EGA & VGA cards respectively. $35. SATFAX is a NOAA, meteor & GMS weather satellite picture-receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, plus WEATHER FAX PC card. $45. All programs are on 5.25" or 3.5" disks (state which) & documentation, add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Old, 4005. Ph (07) 358 2785.

● AMIDON ferromagnetic cores, for all transmitter and receiver applications. Send DL size SASE for data/price to: RJ & US Imports, Box 157, Mortdale, NSW, 2223. (No enquiries at office, please ... 11 Macken St, Oatley). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assos TV Service, Hobart; Electronic Components, ACT; Truscott's Electronics, Melb.

● AUSTRALIAN mapping grid program. Convert your eastings and northings to latitude and longitude. For Melbourne, your Melway 1990 edition 20 shows fine red dotted lines for you, mostly in AMG Zone 55. For Brisbane, your UBD 32nd edition, and for Sydney your UBD 16th edition, shows red marks around the periphery of each map that need pencilling in to get your grid lines, but northings and eastings slop on page for you in AMG Zone 56. The program is on 5.25" or 3.5" disk (state which) postage included for $35. From Alan Judson, PO Box 459, Woolloongabba, Old, 4102.

FOR SALE - ACT

● YAESU FT747GX HF transceiver plus mobile bracket, $900. Glen VK1GL. Ph (06) 254 8002 QTHR.

● TR-2500 Kenwood 2m HH, complete with spkr/mic, batt chgr, mobile cradle/chgr, soft carry case, spare batt. NICADS a bit tired. $275 ono. Paul. Ph (06) 288 7953 AH.

FOR SALE - NSW

● ELECTRONICS Australia mags, Aug'84 to Nov'88, $25 lot. Amateur Radio Action mags, vol 12/11 to vol 12/11, $25. Lot vol 10/11 missing. W. Lesze, 40 Wimbourne Rd, Mulgoa, NSW.

● KENWOOD TS430S litted with all options (CW, AM, narrow filters, FM unit). gen coverage RX, GC, $1400 ono. Ph (02) 971 9795 VK2HL.

● FT290 2m all mode 2.5W $500. FT730 70cm FM 10W $400. Both as new in boxes with scan mikes. VK2JZ. Ph (02) 488 7946.

● VZ300 comp data cass plug packs, as new, inst book try RTTY modem ready to go. Lot $140 QTHR VK2GE Max (065) 85 5732.

● YAESU FL2050 2m linear amp, incl rec pre-amp, as new cond, still boxed cct, $220. VK2GE QTHR. Ph (065) 85 5732.

Kenwood R1000 serial no 0051184 communications rx 200kHz
● to 30MHz, digital readout, VGC, complete with owner and service manuals, $450 ono. Ph (02) 417 1129 or (02) 417 1628, VK2CWF QTHR.

● LAFAYETTE amateur band only receiver model HA-350 $100 ONO. Ph (02) 623 3606 VK2PBM QTHR.

● 1990 RADIO Amateur Callbook,international listings and North American listings, in GC, both volumes, $55 incl postage. Steve VK2PS. Ph (02) 654 1809.

● DECEASED ESTATE Syd Sim VK2AVG. Garage sale 16/17 Feb. 6 x HF rigs. 6 x 2m rigs. WWII collector items, tools, misc elect items. TV sets, aerials etc. 42 Bindea St, Como, NSW, 2226. Ph (02) 528 9835.

FOR SALE - VIC

● ICOM IC502 6M SSB in mint cond, handbook & original box, $145. STC commercial base station converted to6M FM, with 52.525MHz simp & repeater VK3RMS (53.9MHz) 50W with remote cont & mic etc. Comp & going $100 ono. Marconi sig gen 10-300MHz, callb atten to 1uv pd. With circuit and spare RL18 osc tubes, $120 ono. Ian VK3AYK. Ph (03) 523 9405 AH.

● YAESU FT101ZD In VGC with DC-DC converter fan, manual, $700. Yaesu FT707 In GC with narrow CW filter, manual & carton, $650. Damian VK3EHP QTHR. Ph (053) 52 4183.

● NALLY Tower 17m, free standing, wind-up, tilt over. C/W Hyain TH6-DXX HF beam and Emotator 502CXX, heavy duty rotator. All in PC. Replacement $2800, sell $1700. Ken, VK3MW. Ph (03) 560 5278 QTHR.

● CRYSTAL 18MHz for 147.425MHz TX, suit Icom 215, $8. Also Azden PCS3000 with remote cable, $320. VK3YNB QTHR. (053) 31 3829.

● C42 FM Transceiver ex-army, complete with power distribution box and all external cables, mic and h/phones. Best offer plus manuals. VK3ERG. Ph (03) 541 5458 BH.

● REALISTIC HXT100 10m SSB/CW transceiver, only 4 months young with 5ft ZCG mobile whip, $400. Derek VK3DD, Yarra Glen. Ph (03) 730 1557.

● 6-METRE station complete, Icom IC502, IC5OL linear, TET Swiss Quad ant, all good order, complete with handbooks, $250 the lot. Ph (03) 557 5475 Mike VK3KTO QTHR.

● ICOM IC701 S/N 5365, FC, as is, $300. Icom IC22A S/N 3338, FC, as is, $100. Ernie VK3CEW. Ph (03) 467 1503 (home) or (03) 520 0954 (work).

● KENWOOD TS520 transceiver, AC/DC mic and handbook, impeccable cond, any test welcome, $395, buyer collect. Alan VK3AMT Ph (03) 789 9106.

● OSCILLOSCOPE BWD 509B 5" DC to 7MHz wkg order w/ handbook, GC, $100. Rotator "Tama", suit UHF/VHF or light HF W/240AC control unit, new, unused, $100. Command Xmitter 5.3-7MHz w/matching 240AC power supply, GC, $35. VK3SZ QTHR. Ph (03) 560 4305.

● YAESU FT208 handheld, EC, inc batt and mic, $225. Realistic PRO31 fully programmable scanner, as new with box and manual, $225. Ph (03) 782 1115, Norm VK3ZEP.

● EIGHT CHLORIDE positive plate 6V 90amp/hour lead acid cell batteries, $150 ea. Two Power Sonic gel cell, sealed, recharge 12V 50Amp/hr batteries (new), $200 ea. One Power Sonic gel cell sealed rechargeable 12V 40Amp/hr battery (new, $180. Thirty-four General Electric NICAD D-cell batteries, 1.2V 4Amp/hour (new), $10 ea. Two 48V DC 2A regulated power supply, $60 ea. Two 24V DX 1.3A regulated power supply, $40 ea. Evan VK3EJV. Ph (03) 438 2878 AH.

● TX tubes 4-125 new Icom IC202 SSB xcvr tubes, $100 pr. XCVR $120 VK3IZ QTR Ph (03) 718 2293.

● ROTATOR ham IV heavy duty electronic wedge brake, brand spanking new, $690. Ted VK3TG. (052) 59 3225.

● TRIBAND full sized Telrex beam, top performer, $325. Ted VK3TG. (052) 59 3225.

● AT MOTHERBOARD w/1Mb RAM 4.77/10MHz, $150. Case w/ 150W pwr supply, room for 2 full-height drives, $130. 2 x 360K Mitsubishi FDDs, $80 ea. XT keyboard, $50. TI-74 BASICALC — handheld basic computer with scientific calculator, 16k RAM, Mathpac ROM cartridge, all manuals, as new, $200. Non-operational CGA monitor, $30. Peter VK3DXD. Ph (03) 725 1145 QTHR.

FOR SALE - OLD

● YAESU FT7 tcvr, sor 8K110843, incl mic, handbook, VG $320. Yaesu FL110 linear amp, ser 9H070191, with handbook, VG, $150. Commodore C64, ser UKB127445 with Dataset, GC, $100. Realistic AM/FM stereo rcvr STA350, VG, $100. Palac mod osc, ser 5156, 150kHz-30MHz, VG, $60. VK Powermate 13.8V, 10 amps, home brew, $40. VK4CK QTHR. Ph (07) 371 2135.

● FULL SET Kenwood mobile whips and base, $75. Hygain TH3MK3, needs minor repairs, $150 ono. Jim VK4AJS. Ph (079) 28 2843 AH.

FOR SALE - STH AUST

● YAESU FT690R 6M alt mode transceiver, as new cond, in original box. Plus 6M home-brew beam antenna, $480. Bruce VK5ZTO. Ph (08) 292 0569 BH, (08) 339 4955 AH.

● PANASONIC DR49 communications receiver manuals, $400. MSC33 tri-band beam, $200. ARLEC power pack PS 501. 3/6/9/12V, 1AMP. $50. VK5NWL, QTHR. (08) 255 6976.

FOR SALE - TAS

IC251A 2m all mode, $850. IC28A 2m FM, $450. TR9500 70cm, all mode, $750. Dick Smith 70cm 50W linear, $200. TR9000 2m, all mode, $500. Richard VK7RO. Ph (002) 27 8974.

WANTED - NSW

● YAESU 290R 2m rig or similar. VK2EJU. Ph (065) 53 1365.

● UNSERVICEABLE AVO meter, model eight MK3 or movement or moving coil, also top quality valve tester. Will pay good prices. Ph (068) 81 8906, 8 Gosse Ave, Dubbo East, 2830.

● CIRCUIT diagram for Palec sig gen model SG1 plus manual or p/copy. Cost reimbursement. Jim VK2GJW QTHR. Ph (066) 77 9370.

WANTED - VIC

● YAESU FT501 t/sceiver, must be in EC. Will pay good price. Rob VK3JE. Ph (060) 37 1262 or (03) 584 5737.

● TRANSMITTING valves type 810, details to Ian VK3AYK. Ph (03) 523 9405 AH, (03) 428 4732 BUS.

● AWA VHF car phone, type 3J59431 replacement valves and spare parts required. 6BH6, 6AK5, 6AK6, 12AT7, ECH81, 6C4 and QQF03/12. Vincent VK3AJO. Ph (03) 872 3503 QTHR.

● INDUCTANCE & capacitance slide rule scales. Also solar cells similar to those in solar-powered calculators. VK3YNB QTHR. Ph (053) 31 3829.

● DC current probe similar to Tektronix A6302 for digital storage CRO.Must not break into circuit. VK3DE QTHR.

● YAESU FTV250 with manual, GC. Bob VK3EFD QTHR. Ph (03) 374 2416.

● FT101E in good working order. John VK3NUX QTHR. Ph (057) 95 2364.

● CIRCUIT diagram service data for National Radio USA, NC-105 receiver reviewed QST April 1962. All costs reimbursed. Ken VK3ZFI QTHR. Ph (03) 580 5347.

● COLLINS KMW2 or KWM2A transceiver In EC. Will pay good price. Rob VK3JE. Ph (060) 37 1262.

● VARIAC or similar, 150 watts or any bench-type unit. Ron VK3BRC QTHR. Ph (03) 819 3568.

● BC348 or BC312 rcvr. Must be in GC or unmodified. Good price paid. VK3IZ QTHR. Ph (03) 718 2293.

WANTED - QLD

● CRO module for Singer Gertsch S16. Gen. Rod Tow. Ph (075) 63 1308, 5 Hooper St, Boonah, 4310.

● MILITARY radio collector/restorer badly needs cables for C11/R210 W5, case for 128W5, tubes, 6AJ5, 6082, 6AK6, 6BJ6, 6BH6, CV2347, 5B258M regulator 3TFT, VK4EF, 97 Jubilee Tce, Bardon, 4065. Ph (07) 366 1803 AH please.

● WANTED BY WWII signaller British Army valves AR3 AT26, AT50, USA valve 2DF4 for PRC 25 WS, component list Aust Army 128 WS, book for RAAF AR17 receiver. Appreciate any help VK4EF. 97 Jubilee Tce, Bardon, 4065. Ph (07) 366 1803 AH.

WANTED - STH AUST

TEN-TEC CENTURY 21 txcvr, Heathkit HW8 txcvr, 16 quad spreaders, budget priced antenna rotator, 75ohm twin lead, 300ohm ladder line VK5HP. Doc. Ph (086) 49 1956.

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● WANTED please, CW filter for FT707. VK6HC, QTHR. Ph (09) 293 2658.

● INTRUDER WATCH OBSERVERS in VK6. Free tape, logs, postage & advice. Please help. Contact Graham VK6RO, QTHR. Ph (09) 451 3561.

● ANYONE using coherent operating system a unix workalike please contact Jon VK6TU QTHR, possibly form club. Ph (09) 349 9342.

WANTED - TAS

● YAESU FT625R/RD or K'wood TS600 6m txrc. Must be in GC. Damien VK7CDI. Ph (003) 95 4153.

WANTED URGENTLY

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*QTHR means address is correct as set out in the WIA current Call Book.
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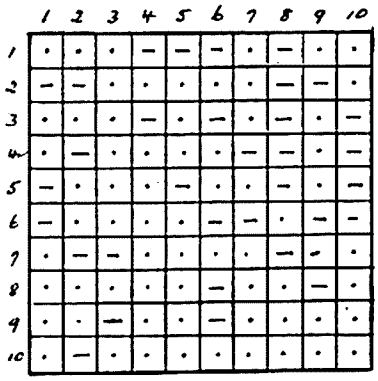

Across: 1 sore; 2 zip; 3 start; 4 leak; 5 daft; 6 bay; 7 wife; 8 suer; 9 errs; 10 lies

Down: 1 rates; 2 arena; 3 hike; 5 dais; 6 king; 7 vase; 8 Moree; 9 real; 10 ions

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Wireless Institute of Australia
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Caulfield South, Vic 3162

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Mr, Mrs, Miss, Ms: .....

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VK3RCW	Continuous on 144.950 MHz 5 wpm, 10 wpm
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VK4WCH	Wednesday at 0930 UTC on 3535kHz (0830 UTC during summertime)
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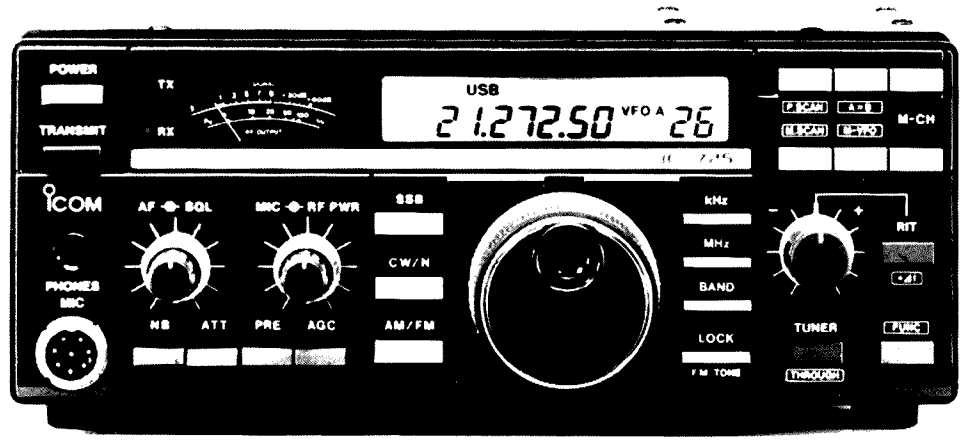

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As an Amateur operator, you know what you want in an HF rig. In fact, although Icom are THE professionals when it comes to communications, it is the Amateurs from whom we seek guidance when designing and developing superior equipment. That's why Icom leads the way in Amateur Communications. If space here permitted, we could go into lengthy discourse about Icom's outstanding features and options, but you're probably aware of most of them. Just to prompt your memory, here's a brief summary of our HF Range –

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AMATEUR RADIO

MARCH 1991 RRP $3.25

THE WIA RADIO AMATEUR'S JOURNAL

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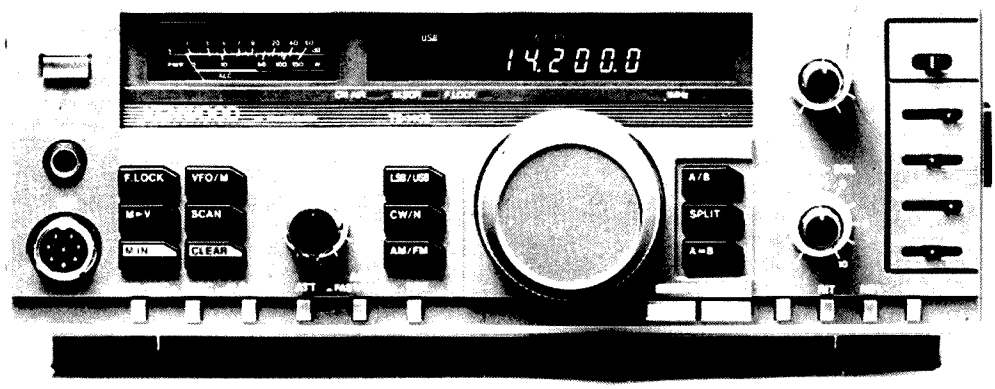

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Publication..... Issue .....
Model.....

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 59 No 2 ISSN 0002-6859 March 1991

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EXECUTIVE EDITOR
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Graham Thornton VK3IY

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ADVERTISING
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All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161

Telephone: (03) 528 5962
(03) 523 8191

Fax: (03) 523 8191
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Cover

One way of overcoming the initial difficulty of erecting a tower! The picture shows the VK2RGN 2m and 70cm repeater tower in course of erection. This repeater, located atop Mt Grey, is the pride and joy of the Goulburn Amateur Radio Society. Photo – David Thompson VK2BDT.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Denouncing the Doomsayers

It isn't often that this editorial quotes in quantity from another, but it certainly reduces the need for original thought! When the other editorial has such a worthwhile message, it does make the borrowing easier. I'm talking about the January issue of *World-radio* (an American commercial magazine) but actually its editor, Armond Noble N6WR, himself borrowed it from the newsletter of the Sun City (Texas) Amateur Radio Club. Our situation in Australia is virtually an exact parallel, detail for detail. The writer in the original newsletter was Mark Forbes KC9C, and the title was "Enough Doomsday Garbage".

"I've read enough garbage about the coming end of amateur radio, and enough 'information' supporting such conclusions which have no semblance of fact. Here are the facts — you can look them up:

1) *Amateur radio is GROWING . . . the number of hams has roughly doubled in the past 20 years (source: FCC data and the Callbook). In fact, the rate of growth is about* ***twice*** *that of the general population (source: ibid, and facts on file).*
2) *We've acquired several new bands in the past 10 years, particularly 12, 17 and 30 metres.*
3) *We've acquired more new privileges in the past 10 years than in any decade of the service, specifically space and packet related, plus HF for technicians and VHF/UHF for novices.* (There is one difference in Australia — our limiteds have no HF, but US technicians do have a Morse qualification. 3ABP).
4) *We've acquired more new emissions in the past 10 years than in any decade of the service, especially ASCII, packet and AMTOR.*
5) *It is quicker and easier to get tested and licensed than ever before.* (I omit the US details, but our exam devolvement has produced very similar results. 3ABP).
6) *No longer do you have to wait 4-12 weeks after passing an exam . . . to begin using your new, hard-earned privileges. For the first time instant upgrading is possible.*

Yes, yes, we have lost some frequencies. It's lamentable, but it sure isn't new. It's been going on since 1977, and rearrangement of the spectrum will continue as long as there's human life on earth. We have more frequencies than anytime in recent history.

Let's fight to keep what we have. And, yes, let's work to get more. But all this moaning and crying and tossing about insupportable conclusions based on fabricated data does no one any good.

If you are that upset with your hobby then please find something else to occupy your spare time."

May I ask you two questions? Would we have reached this relatively happy state, and have hopes of improving on it, had it not been for the efforts of the ARRL and the WIA and all the other societies in the IARU? Should not ALL amateurs support their societies?

Amateur Radio

Helping our Community

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Representing Australian Radio Amateurs - Member of the International Amateur Radio Union

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All mail to: **PO Box 300, Caulfield South, Vic, 3162** Telephone: (03) 528 5962 (03) 523 8191
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Business Hours: 9.30 am to 3.00 pm on Weekdays

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

1990 Ron Wilkinson Award Winner

At the February quarterly meeting of the full WIA Executive, it was decided that the Ron Wilkinson Award for 1990 will be presented to Keith Cunliffe VK2ZZO, for his continuing effort and achievement in amateur television and his part in the ATV test transmissions via AUSSAT. In addition to a very handsome certificate, Keith will receive $200.00 plus one year's membership of the WIA.

It was also decided by Executive that a President's Commendation Certificate be awarded to the Gladesville Amateur Radio Club for their activities in association with Keith Cunliffe in presenting ATV transmissions via AUSSAT and their work in the field of educational ATV.

World First for VK3 Amateur

Maggie Iaquinto, VK3CFI, has become the first in the world to work the Russian satellite station, U2MIR on packet radio. After two years of trying to make an MIR contact she finally spoke to Musa on 13th January 1991 at 2145 UTC.

Maggie spoke with Musa and Victor U9MIR on each of several mornings and then, during the contact on Saturday, 19th January, Musa asked her to come up on packet. After a hurried setting up, connects were made but by then the pass was over.

Having received Maggie's instructions, Musa had his PMS operating by the next pass 92 minutes later. On subsequent passes files were exchanged and Musa is now fully operational on packet. He is also anxious to experiment with BBSs.

Maggie has sent up files on this and VK3JAV has set up a port for Musa to access his BBS. Maggie is justifiably very excited about her activities.

Interference Investigations

DoTC advises that Ministerial approval has been received for institution of the call out fee of $60.00 for interference investigations by Departmental inspectors.

The Executive Office recently received a copy of the second edition of *"Better Television and Radio Reception, Your self-help guide"*. This booklet was first published by DoTC in 1989, and has proved extremely useful to both service technicians and individuals with interference problems. The new edition does not appear to include many changes apart from some of the pictures and some colour, but it does up-date the contact addresses for DoTC offices and Inspectors, and enlarges the

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun (R Denotes repeater) Times 1045 and 1915 on Sunday	(F) $87.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Tim Mills David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2ZTM VK2KFU	1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Old 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Eddie Fisher Eric Fittock	VK4AOK VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $87.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Alyn Maschette John Farnan Bruce Hedland - Thomas	VK6KWN VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

list of filters and similar devices.

A Media Statement from the DoTC notes that, of 15,000 interference complaints last year, *"only 3,000 were relevant to the Department's responsibilities in fixing interference to radio, television and radiocommunications services"*. Most of the complaints received were due to faults in the complainants' equipment or to interference from powerlines. A Telephone Advisory Service has also been established (phone 008 077 145) which, with the help of the booklet, should reduce the demand on DoTC services and allow staff to concentrate on other matters.

SEANET Convention

The 1991 annual SEANET convention will be held in Chiang Mai in Northern Thailand on the weekend of 8th - 11th November. The Radio Society of Thailand will be host to the convention, and will arrange other activities such as sight-seeing or shopping trips.

SEANET operates daily on a frequency of 14.320 MHz from 1200 Z with, on average, over 50 stations in the south Asian area checking in each day. The convention is a chance for all these operators to meet in person. Naturally other interested amateurs are welcome. A report on the 1989 SEANET convention was published in the September 1990 issue of Amateur Radio magazine, and a report on the 1990 convention is in this issue.

Further details of this interesting weekend can be obtained from GPO Box 2008, Bangkok 10501, Thailand, or via the net.

Visitors Licence in Thailand

The January 1991 bulletin from the Radio Amateur Society of Thailand notes that foreigners who hold valid home amateur radio licences and who are resident in Thailand may now apply for a temporary licence there. Conditions under which these licences may be obtained are listed in the bulletin. This system applies to citizens of countries which do not have reciprocal licence arrangements with Thailand. A reciprocal agreement between Thailand and the USA has just been concluded.

Standards Australia Symposium

During November 1990 Standards Australia (SA) conducted a seminar on "EMI/EMC - where is Australia going?" The same seminar was presented in Sydney, Melbourne and Canberra to achieve a wide exposure and papers were presented by speakers from government, QANGOs and industry. A number of WIA members attended at the various venues, often in connection with their employment.

Several papers were of interest to the radio amateur and permission has been obtained to reprint at least two in Amateur Radio magazine. Of particular interest was the relationship between Standards Australia and AUSTEL.

Standards Australia, through its many committees, prepares a wide range of Australian Standards; some even being total reprints of overseas standards between SA covers and with a SA number. Standards Australia, being an advisory body, cannot mandate any of its standards; they must be prescribed by a government body, agency, authority or an industry controlling body.

For example, the Australian Standard on electrical wiring practices is called up by all state electricity authorities as their minimum requirement. On the other hand standards issued by AUSTEL are mandatory requirements on builders, installers and others engaged in the communications industry. Standards Australia and AUSTEL work together in producing AUSTEL standards so the high degree of consultation and industry involvement seen in SA standards will carry over into AUSTEL standards.

It was not clear from the seminar why AUSTEL chose this route rather than cooperating in producing Australian Standards and then mandating them. Perhaps some obscure legal nuances are involved?

Another paper of interest related to an international electromagnetic compatibility (EMC) Standard for information technology equipment (ITE), which is presently covered in IEC/CISPR 22, published by SA as AS 3548. Agreements shortly to be implemented in the European Economic Community will have world wide implications for international manufacture and marketing.

The WIA is a member of Standards Australia and continues to monitor its activities on your behalf for matters which might impinge upon amateur radio operations.

WARC 92 APG Committee T

The Australian Preparatory Group for WARC 92, Technical Committee T, held its sixth meeting in Canberra on 18th December 1990. The WIA was represented by David Wardlaw VK3ADW, its WARC92 team leader and Ron Henderson VK1RH.

The meeting devoted most of its time to reviewing the implications for Australia of the reports of a series of Interim Working Parties which had met in several countries during recent weeks.

Several key issues arose including consideration of which services can share band segments, frequencies for vertical radiation, weather sounding radars, the needs of Low Earth Orbit (LEO) satellites and the ever present demands for spectrum in the 1 to 3 GHz band.

Amateurs will be no strangers to frequency sharing, for we are the secondary service in a number of our bands. However, are you aware of the degree of sharing that takes place on a daily basis? Just watching a band segment for a short period of time with a pan-adaptor receiver or a spectrum analyser is an education, as ionospheric sounders, scanners and other incidental short term radiations take place on a daily basis.

Sharing can be on a geographic basis, common at UHF and microwaves (we share 576 MHz now with television broadcasters), or on a frequency basis (such as on 7100 - 7300 kHz), or on a time basis (as amateurs did with MF broadcasting stations in the 1930's).

Committee T is preparing matrix tables of services to indicate which service can share with which and under what conditions. These tables will be part of the Australian delegation brief to WARC 92 so the WIA representatives, acting for the Australian amateur service, are active in this table compilation to ensure they accurately represent the real world of radio transmissions.

Committee T has now reached the stage where small sub-committees of selected specialist members are preparing summary or conclusions papers, distilled from over one hundred Committee T input papers. The meeting in late January 1991 will review those summary papers and their implications upon the WARC92 agenda.

Shortly, a number of Committee T members (including David Wardlaw from the WIA) will travel as the Australian delegation to a CCIR Joint Interim Working Party (JIWP) meeting, to be held in Geneva in early March 1991. The JIWP is charged with producing the technical reference material for the WARC, so once again the WIA will be present in this lead up to decision making.

Use 'em or Lose 'em

This reference to the amateur bands has been around

for a long time, but it is probably more appropriate now than ever before. Commercial interests are looking at under-used band space with greedy eyes and offers to pay for that to which we, so far, have had almost free access.

Our delegates to WARC 92, and the preliminary meetings, will be arguing our need for spectrum on the basis of the value of the amateur service to the community and our contributions to technological developments. But it is hard to argue that we should retain allocations that are unused for most of the time.

For instance, have you used 10 metres lately?

Intruders

Commercial interests are not only looking at our bands. Some are actively using them. More volunteers are always needed to log these intrusions.

The WIA Intruder Watch Co-ordinator, Gordon Loveday VK4KAL, will be happy to supply information on how to begin logging and reporting the commercial and broadcast stations trying to take over our bands. Drop Gordon a line at "Aviemore", Rubyvale, QLD 4072, and tell him how you can help.

Improved Commercial Broadcast Facilities

DoTC recently advised of several increases in radio and television services to country areas.

Test transmissions of both radio and television from the ABC for the Mallacoota area were due to begin in early January, via AUSSAT and a transmission facility on Mirrabooka Hill. Television will be on UHF Channels 56 and 57, radio on 103.3 and 104.9 MHz.

Plans submitted by commercial television licensees for broadcasts in the northern NSW area have been approved. Networks 9, 7 and 10 affiliates expect to begin operations in this area during 1991 and 1992.

Two new commercial UHF television services to cover much of regional Queensland were due to begin at the start of this year.

Spectrum Plan Published

Australia's new radio frequency spectrum plan has now been published and copies are available from Australian Government Publishing Service bookshops for $21.50.

This plan is now *"the legal basis for allocating spectrum to all types of services in Australia, including broadcasting, mobile radio, aviation, defence, radio-astronomy and many other services"* according to the DoTC Media statement.

Morse Code Practice

Although some of our members feel that proficiency in Morse code is no longer essential in the amateur service, it is likely to remain a prerequisite for a licence at least until the WARC after WARC92.

Several WIA Divisions help students to become proficient in this field through weekly Slow Morse broadcasts. The program for these transmissions is printed near the back of Amateur Radio magazine in alternate months, so if you know a learner who needs help you can direct them where to listen.

Recent advice from the VK4 Slow Morse Co-ordinator includes a few changes to the schedule, which will be incorporated into the listings for its next publication.

As well as the official WIA Slow Morse transmissions, a number of other slow morse nets are run by groups or individuals. One of these is the *"Early Birds"* net which operates on 3.539 MHz at 07.00 EST each day.

Whatever your needs, there is probably a slow morse training transmission that will suit you.

American Code-Free Licences

As reported previously the USA has introduced a code-free grade of licence at technician level, similar to the Australian Limited licence, which has been available for over 35 years.

The introduction date was set at 14th February 1991. The ARRL expects a significant influx of new licensees as a result of this new grade of licence.

CW Testing of the Disabled

The American control body, the Federal Communications Commission (FCC) has established procedures whereby people with certain disabilities may be exempted from the 13 and 20 wpm Telegraphy tests. Exemption will be based on a medical certification that the person is too severely handicapped to be able to pass the examination.

There is no intention to allow exemption from the 5 wpm entry level Novice licence for operation on the bands below 30 MHz. Recent *"Over to You"* letters published in Amateur Radio magazine have debated the advisability of the WIA attempting to persuade DoTC to consider a similar proposal.

WICEN

Already this summer several WICEN groups have ben activated to help in civil emergencies. The arrangements for activation, and the authorities for which help is provided, vary from state to state, but in all areas the potential value of WICEN is being more and more appreciated by the civil emergency authorities.

Only the army has a greater range of frequencies than the amateur service, and no other body has such access to sophisticated equipment, variety of modes or numbers of trained personnel. Provision of communications for community events by WICEN is an ideal way to bring the benefits and potential of the amateur service to the attention of the general public. The image that the amateur operator presents at such a function is very important in establishing the hobby in the minds of the audience.

USA to Protect Amateur Frequencies

A Bill recently introduced to the USA Congress will, when passed, ensure that *"the Federal Communications Commission shall not diminish existing allocations of spectrum to the Amateur Radio Service after January 1, 1991. The Federal Communications Commission shall provide equivalent replacement spectrum to the Amateur Radio Service for any frequency reallocation after January 1, 1991."*

USA Novice Band Changes

The USA Federal Communications Commission (the American equivalent of the Australian DoTC) has announced a change in its rules to move the 80 Metre Novice band down from 3700-3750 kHz to 3675-3725 kHz. The move is intended to reduce mutual interference between American and Canadian amateur stations.

Phone Patch

It is a requirement by Telecom that before a phone patch can be used, the equipment must include an approved Line Isolation Unit.

Licensed Australian radio amateurs have been given permission to build their own line isolation units in accordance with an article which appeared in the September 1987 issue of Amateur Radio magazine, but these units must be inspected and approved by an authorised inspector before being put into use.

Until recently this inspection has been carried out by Geoff Donnelly, VK2EGD. Geoff has been of invaluable assistance to many amateurs but, for personal reasons, has

had to relinquish this position.

The New South Wales Division has now appointed Brett Wikinson VK2XMU to act in his place.

Licensing Statistics

The quarterly return from DoTC giving statistics of licensed Australian Radiocommunications stations shows that in the three months from September 1990 the amateur service has grown from 18948 to 19194, an increase of only 156.

In the same period the licensed Citizens Band Radio Service has grown by 11,848, and now stands at 407,844. This works out at a growth rate of 2.9% per quarter as against 0.8% for the amateur service.

When there is that much interest in radio as a communication method, why is the amateur service attracting so few newcomers?

Order of Australia for Radio Amateur

It is with great pleasure I advise to those of you who do not already know that Graham Ratcliff VK5AGR, the WIA Federal AMSAT Co-ordinator, was listed as a member of the Order of Australia in the 1991 Australia Day Honours list.

The citation said "For services to amateur radio organisations".

Congratulations, Graham. Well done!

WIA Membership Grades

There seems to be some confusion among members about the various grades of membership of the WIA. When some degree of standardisation between the Divisions was achieved in 1989, it was agreed that the concessional or "G" grade rate should be instituted to offer a concession to any members on reduced incomes on a short or long term basis.

The criteria for this concession were set at possession of a Pensioner Health Benefits card, or certification of full-time student status. Provision was also made for the concession to be allowed at the discretion of the Division to members whose financial circumstances are not better than those of a holder of a Health Benefits Card.

It was never intended that the concession would be automatic to all retired members, or all members over a certain age. If we worked on this system, a substantial number of our members would be at the concessional rate (the average age of radio amateurs in Australia is now estimated to be 54 years!).

Back Copies of Amateur Radio

For economic reasons a normal monthly print run for Amateur Radio magazine is generally 150 copies more than the number that is sent out to members and direct subscribers. By the time copies have gone to article contributors, advertisers, families of Silent Keys, in exchange for international magazines, and are included in the many *"WIA Information Packages"* forwarded to prospective members each month, this number is reduced.

In some months there are very few copies of the magazine left for members who happen to want an extra copy to give away (an additional copy of Amateur Radio magazine can usually be purchased from the Executive Office at a cost of $4.50 posted per issue). For instance, during 1990 the office ran out of stocks of both the June and the November issues.

It is of course quite uneconomic to have more printed (considerable numbers of excess copies printed in earlier years recently had to be dumped) but, if there is a particular article you require, photocopies can be arranged at a cost of $2.50 per article.

Hamads

For many of our members the first part of Amateur Radio magazine they turn to when it arrives in the post each month is the Hamads page. Usage of this page by members has increased now that the lead time is reduced to just over two weeks from closing date to arrival of the magazine in the mailbox.

But it is not necessary to wait until the closing date to submit your advertisement. It can be received and processed at any time, and will be published in the first possible issue after receipt at the Executive Office.

Hamads is a very economic way to reach a large potential market. Incidentally, those who are not members, or who have commercial quantities of goods to advertise, are always welcome to use the Trade Hamads section.

Executive Office Book Stocks

The Executive Office is still holding stocks of WIA logbooks, both horizontal and vertical format at $5.00 each to members (plus postage), Band Plan booklets at $2.80 each including postage, and Study Guides for Novice Operators Certificates of Proficiency at $2.50 each posted.

There are also a few 1991 Call Books available at $9.50 plus postage.

WARC Donations

Thanks are due for donations received this month from J. P. Hodkinson VK2BHO, and D. R. Rogers VK5KON.

All financial contributions to assist WIA representation at WARC 92 will be gratefully received.

Twenty Year Index

The twenty year index is now a twenty two year index! As each issue of Amateur Radio magazine arrives the titles of the technical articles in it are added into the index. The index is available to members on disk ($10.00) or in hard copy ($5.00). This index has proved popular with members as well as being of great value in the Office. Being on a computer database, it allows sorting and printing of lists of articles by category or by author, etc.. This speeds up research considerably.

National WIA Meetings

A quarterly weekend meeting of the full Executive of the WIA was held in Melbourne over the weekend of the 9th and 10th February. In an intensive work period of over 18 hours, plus several more hours of informal discussion, a vast number of items were considered. Some of these were items which have been under discussion for some time, others were newly raised or were procedural matters which did not require lengthy consideration. More detailed reports of many of these items will appear in the April issue of Amateur Radio magazine.

General meetings always open with a period for reports by executive members and the General Manager. At this meeting George Brzostowski reported on plans in the VK1 Division to celebrate the 200th anniversary of Samuel Morse's birthday. The event will be conducted over a period of about 10 days with the main events on the 27th and 28th April. Special callsigns are being sought for a station at Canberra and one at the old Telegraphy Station at Alice Springs.

Bill Wardrop reported on a recent display of amateur radio in three large Adelaide shopping centres. Ron Henderson reported on plans for a WARC presentation at the 1991 Gosford Convention.

David Wardlaw reported on progress of the WARC preparation. After a Committee T meeting in Canberra in mid-February, David will then be attending a Joint Interim

Continued on page 7

Random Radiators

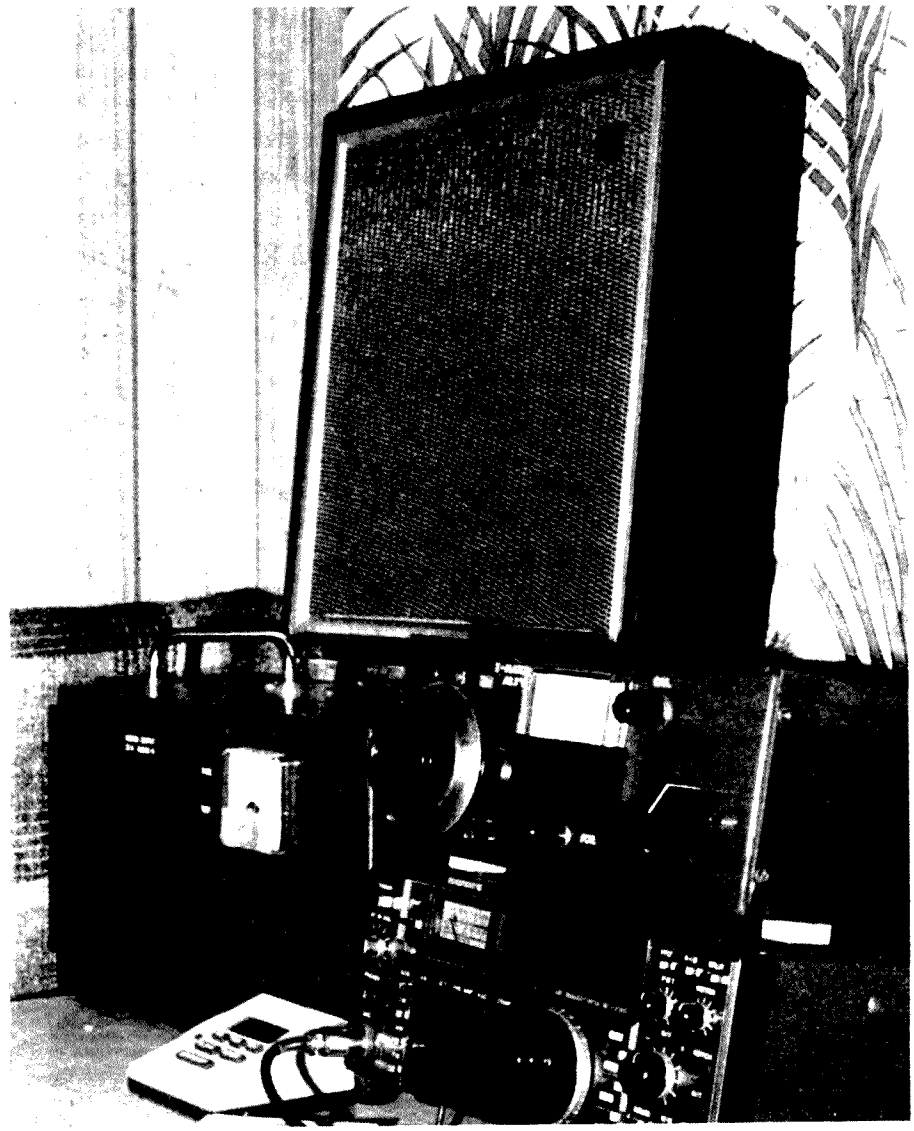
RON COOK VK3AFW &
RON FISHER VK3OM

THIS MONTH WE TAKE a quick look at a Z match as constructed and used by one of our Z match club users. We discuss the relative merits of quads and yagis as HF antennas. Some thoughts are shared on a most useful coax switch and a new book that I am sure will be of interest to readers of this column.

Firstly, I received a very nice letter from Geoff VK3BGC who has just found out the joys of using a Z match. Over to Geoff:

> This is a note from an appreciative builder and user of this Z-match tuner for the past few months. The photograph shows the item in use for the first time in the writer's portable station at a caravan park at Yamba NSW during October 1990. The antenna was a 20m dipole fed with 300-ohm ribbon and matching stub for a calculated 300-ohm resistive load at resonance. This dipole was also used on 10m (gingerly) radiating 100 watts with arcing in C2. Among the 10m DX contacts made was one with an amateur operating MM from the *USS Nassau* in the Gulf of Oman. For JOTA I made a 20m double-extended Zepp and obtained a VSWR of 1:1 on all bands.
>
> Operating behaviour is very much as described by yourselves and Lloyd Butler in *AR* for December 1990. With the 20m dipole as above at a fair height (10 metres) C1 was slightly greater than 300pF at 300 ohms fitting the curve of figure 4. I have acquired the skill of two-handed operation of C1 and C2 achieving 1:1 in seconds.
>
> The SWR indicator is the "Varimatcher" from the ARRL Handbook, 1968 edition, page 557.
>
> C1 is connected via a flying 50-ohm lead to preserve symmetrical geometry and allow it to be used as a separate instrument. This 9-inch-long device fits neatly inside the rear of the case.

Thanks Geoff, I hope this might give heart to our readers out there to give the Z match a try. You won't be sorry.



The VK3BGC equipment portable at Yamba NSW showing home-brewed Z Match atop an IC 735.

(continued overleaf)

WIA News continued from page 6

Working Party (JIWP) meeting in early March in Geneva as an accredited Australian delegate. Amateur frequencies under threat include some of the 7.1 to 7.3 MHz section of the HF bands, 70 cm and 2.3 GHz.

Some time was spent planning for the Annual General Meeting which now replaces the previous Annual Conventions. After investigation of costs and facilities provided by a number of possible venues, it was decided to return to the Brighton Savoy Hotel/Motel. Delegates will arrive on the evening of 19th April to enable an early start on the Saturday. It is hoped that business will conclude by mid-afternoon on the Sunday.

The Executive noted its appreciation of the offer of George Brzostowski to continue in the position of the WIA Legal Counsel, and took much pleasure in appointing George officially as the WIA Honorary Legal Counsel.

After several months of consultation, the specifications for the role of the Education Co-ordinator were finalised and accepted.

Extensive discussion ensued on future representations at international events such as WARC and IARU conferences. The need for another Melbourne-based member of Executive was also raised again.

If you require elaboration of any of the items discussed at this quarterly meeting of the full WIA Executive, please contact your Divisional Councillor. ar

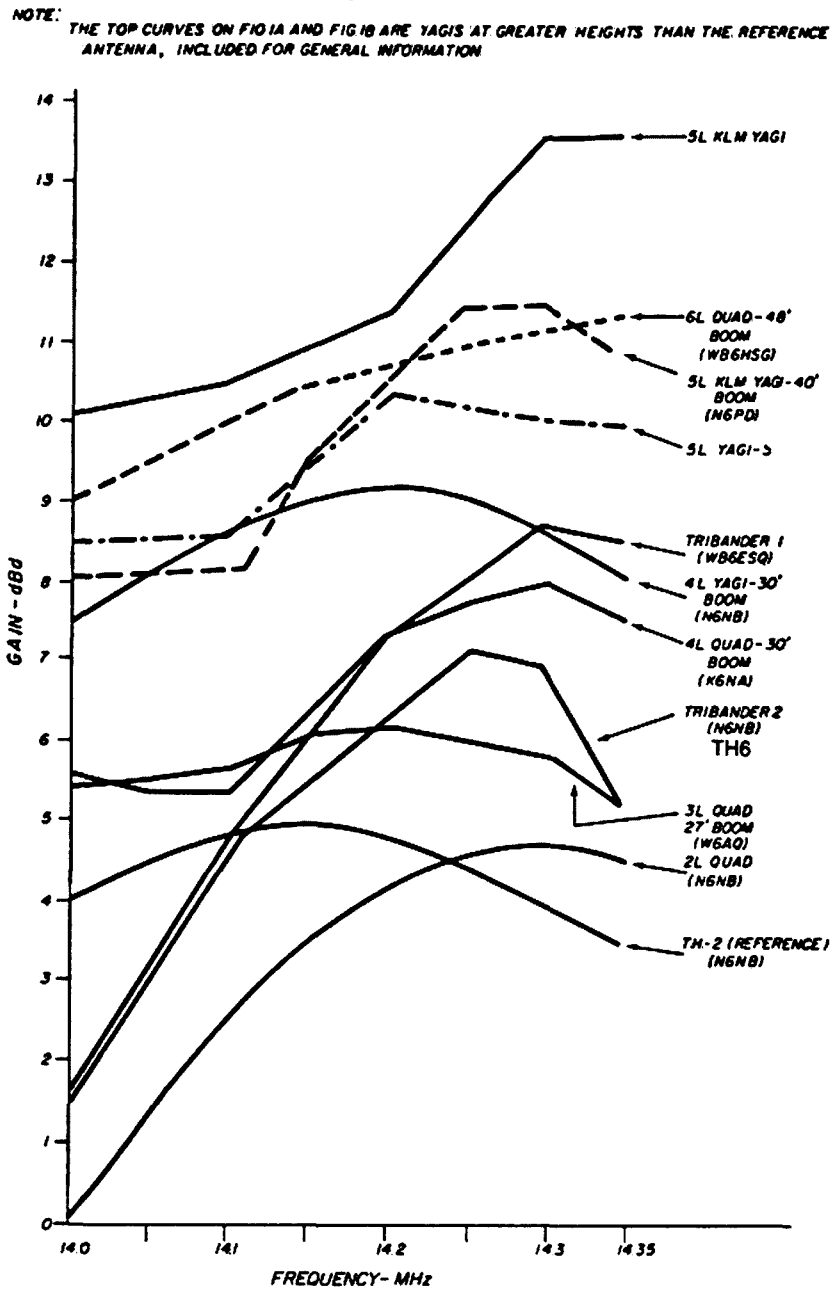
Quads vs Yagis

If you really want to get a heated discussion going on the air, just tell your contact that your Yagi will out-perform his Quad any day of the week. Everyone knows that a Quad should outperform a Yagi because it has twice the length of element in it, hence a two-element Quad should out-perform a two-element Yagi by something under 2dB. And, of course, everyone knows that at a relatively low height, a Quad will outperform a Yagi at that same height by something more than 2dB.

Right? Well, maybe and maybe not. Firstly, it seems to me that the greatest supporters of Quads are amateurs who have had Quads once upon a time. These people get a glazed look in their eyes when they tell you how their Quad opened and closed the band. Unfortunately, the Quad fell down a few years ago and they have since replaced it with a tri-bander Yagi. Well, so you ask, how much better (in dB) was the Quad compared to the tri-bander. It's at about this point that the answers get rather vague.

So where do we go to get some answers to our questions. I feel that an article published in the May 1979 issue of *Ham Radio* provided many of the answers. The author, Wayne Overbeck N6NB, set out on one of the most ambitious experiments with antennas that I have ever come across. He took a trailer-mounted 75ft tower with tri-band two-element Yagi on top to many locations around California, and did side-by-side test against many antennas, both Quads and Yagis. With a reference against these antennas he was able to directly compare the performance of big and small beams and come to some interesting conclusions. However, Wayne did not only have one portable 75ft tower, he had two, and was therefore able to do tests on relative performance at various heights. But, let's go back to the start and let Wayne set the scene:

> The Quad-versus-Yagi question has been argued with anecdotes, testimonials and hunches, as well as with theory and quantification. Intuitively, some Quad builders have concluded that their antennas were just not 2dB better than similar sized Yagis. Others have reached the opposite conclusion by trusting the same intuitive sixth sense. The great majority of big winners in DX contests today are using Yagis, not Quads. If a Quad is equal to a Yagi nearly twice its size, how could this be?
>
> In an attempt to resolve this issue, I've spent hundreds of hours measuring the performance of Quads and Yagis in both the high frequency and VHF spectrum and have encountered considerable evidence that the cubical Quad is NOT inherently superior to the Yagi.
>
> This seems to be particularly true below 100MHz. However, there are potential variables that may sometimes bias the results of UHF modelling in favour of the cubical Quad.



At the beginning of these tests, Wayne did a lot of work measuring the gain of Yagis and Quads at VHF and UHF frequencies. He found that the higher in frequency he went the better the Quad performed than the Yagi. It seems that the dipole-driven element of the Yagi is the problem. It is just not as effective as the Quad element. However, by the time the frequency had dropped to 144MHz there was little difference in performance. This seems to indicate that UHF modelling of HF antennas may not always produce an accurate result. Jim Lindsay's W0TH QST article, "Quads and Yagis", of May 1968 presented much data showing that the Quad of any length would out-perform a similar sized Yagi by 2dB in forward gain; Lindsay stated that it would be necessary for a Yagi to have 1.8 times the boom length of a Quad

to equal its forward gain. He based his findings on model Quads and Yagis operating on 400MHz.

Wayne came to the following conclusions:

1. Cubical Quads do NOT "come into their own" at low heights. At any given height, the vertical angle of radiation of Quads and Yagis is virtually identical. The old idea that Quads are better low-height performers than Yagis should be recognised as the myth it is.
2. As the frequency is increased into the UHF region, the performance of Quads and Yagis may not deteriorate at exactly the same rate, given the mechanical differences between the two designs, particularly their driven-element configuration. This creates difficulties that must be accounted for if you wish to generalise about the relative performance of the two antennas at the high frequencies on the basis of UHF modelling.
3. While it may be possible to design a high-frequency cubical Quad with a long boom that will outperform a similar size Yagi by 2dB as Jim Lindsay suggested, no Quad I tested approached that level of peprformance. In only a few cases did a Quad of more than two elements even equal a comparable sized Yagi. In fact, the Quad seems to be better in its two and three-element designs.

"If this field research suggests that long Yagis are the most consistent high-performance antennas for the serious DXers and contest operators, where does that leave the thousands of amateurs who use trap tribanders? How good are these multi-band Yagis?"

Perhaps the most notable conclusion, and the least controversial, was that the tribanders sacrifice bandwidth for multiband operation. If adjusted for phone-band operation, there was dramatic gain fall-off in the CW portion of the band.

I have included here the relative gain measurements taken on 20 metres. Some notable points of interest are: the gain of the TH-2 tribander reference antenna and the two-element Quad peak at about the same amount, but the Quad has a much better bandwidth. The tribander number 2 is in fact a TH-6 tribander which is well known in Australia. Note the rapid fall-off of gain at the low frequency end.

I guest that this doesn't answer the question which is the better antenna? But it might give some food for thought. By the way, if you would like to read the full article, I would be happy to send you a copy on receipt of a large SAE.

Just to finish off, the author finishes up with a most interesting challenge. He states, "Bring me a high-frequency Quad of four or more elements that you believe out-performs a comparable-length Yagi. I'll provide two towers in an open field for the side-by-side tests. If your Quad really delivers 2dB more than my Yagi, I'll publicly recant the conclusions presented in this article."

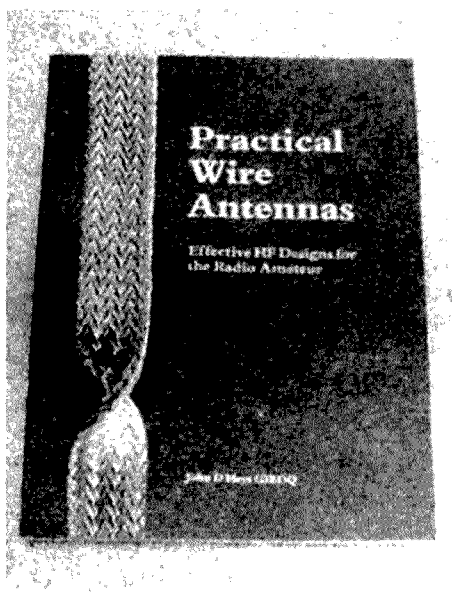
An interesting challenge which, to my knowledge, has not been taken up as yet.

Practical Wire Antennas: effective HF designs for the radio amateur

by John D Heys G3BDQ

A Review

If you read this column, then I could guess that you have a passing interest in antennas. Perhaps, like me, if a new antenna book comes out, you cannot get your hands on it quickly enough. Well, here is a new one that has just become available through Mag Pubs. It's another one of those marvellous books published by the Radio Society of Great Britain. The author, John Heys G3BDQ, has been writing for the amateur radio press for well over 40 years. I have on file many of his articles in the old *Short Wave Magazine* circa 1950. From a look through this book, it's obvious that John has had an interest in antennas for a long while and, perhaps more importantly, an interest in simple (put it up this weekend) type antennas. This is a book devoted to wire antennas, so you won't need to stock up with expensive aluminium tubing to try any of them out. The theoretical side has been kept short and to the point and, for the most part, the book is full of diagrams showing the physical layout of the antennas described; and, in many cases, the directional patterns that might be expected.



Have you ever had an idea on putting up (or down) an underground antenna? Well, this book will show you how to do it, and John even claims that it will work. Most council regulations only cover antennas up in the air, so here is a way to get around that one.

All of the old favourites are covered, and these include Zepps, double-extended Zepps, long wires, loops, delta loops, the T2FD, naturally the G5RV, plus many others.

There is even a chapter on antenna coupling units with both balanced and unbalanced types described. The Z match is described, but only mention of the G5RV modified type is covered. I have tried this one and found that it has no advantage over the standard type and neither is as good as our own Ronony-mous Z match. I guess that John had not caught up with ours when his book was written.

However, if you want to have an excellent reference available when you are contemplating some new antennas, this book is highly recommended.

Check your local Mag Pubs outlet. If they haven't got it, tell them to get it fast. This book is going to be a fast seller.

The Dick Smith D-5204 four-way coax switch

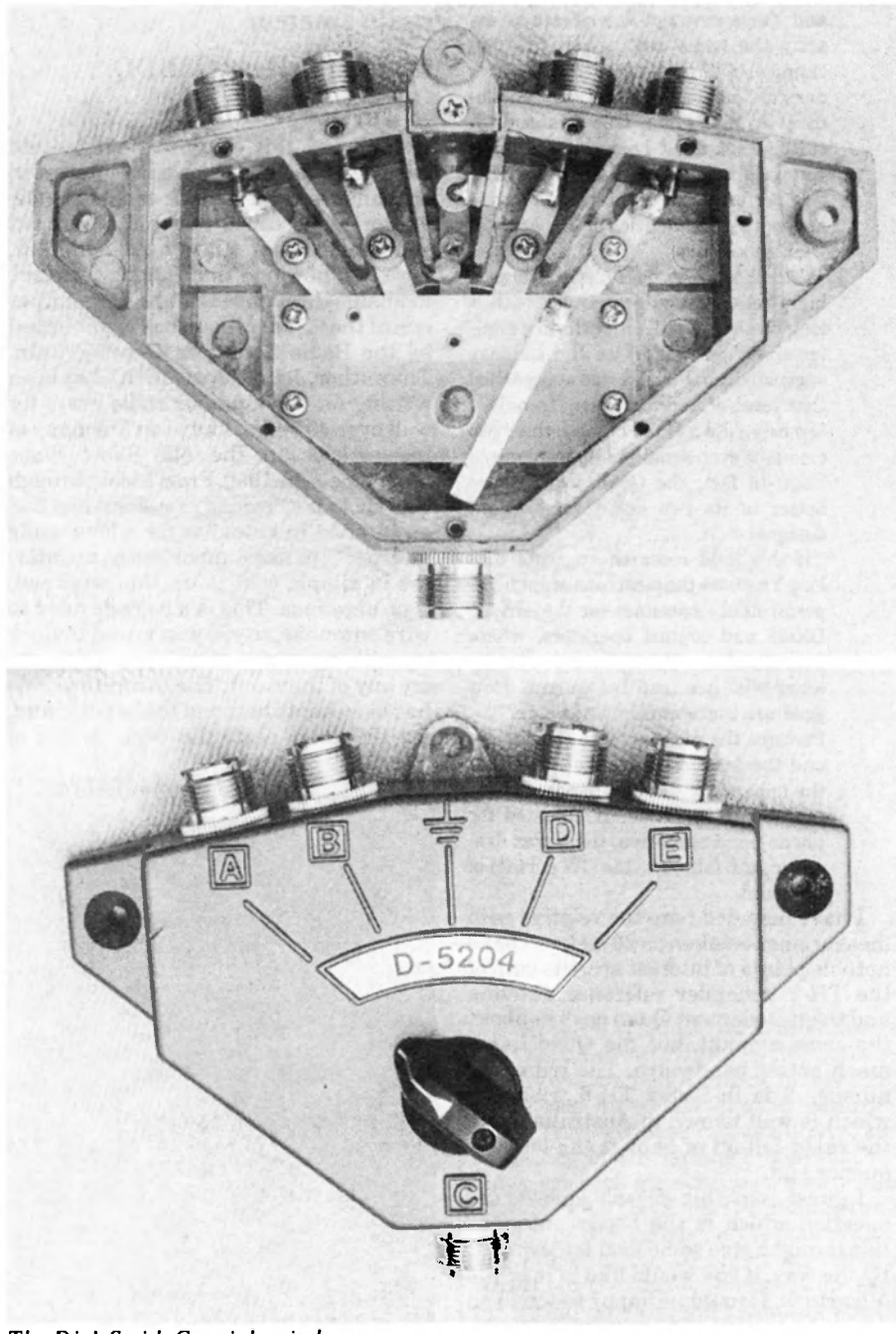
As you might imagine, writing a column like this involves quite a bit of playing around with antennas. You soon find out that some form of switching is required to give instantaneous comparison reports from different antennas. Well, a few weeks ago, my antenna switching system fell short of requirements. I not only have several antennas but also have a choice of transceivers, so some switching is required at each end, so to speak.

The Dick Smith four-position switch appeared ideal. I was even more sure when I found out that the price had been reduced from $99 to only $89. I am not sure if they still are $89, but even at $99 they are excellent value. By the way, if you want to, you can buy the same switch from another well-known distributor and pay $129 for it. Of course it has another brand name on it, but is identical in every other way.

A quick look at the photos will give you a good idea of the construction both inside and out. To say that it is rugged is an understatement. Construction is in solid die-cast aluminium with each output lead formed from a solid-copper strip running through a precision-formed cavity to maintain an exact 50 Ohms. It is rated to carry 2kW of RF power at 30MHz with a loss of less than 0.3dB. Firstly, I would say that this loss figure is very conservative and that the switch will operate well into the VHF region with very little power loss. Two safety features are built in. Firstly, there is a centre switch position that connects everything to earth, and secondly, there is a built-in surge protector which is presumably designed to flash over to earth if a lightning strike occurs nearby. Now here is my only criticism of the switch. Well, not the switch itself, but the information that is supplied with it. Let me re-phrase that. The information that is not supplied with it. What happens if the surge suppressor is hit by a lightning bolt? Does it need replacing? I don't know, and the sparse information on the box doesn't say. What a pity for an otherwise very well presented product.

I should mention that I am only using the switch up to 30MHz where it selects two rotary beam systems and various wire antennas fed via a Z match coupler and an old Johnson Matchbox coupler.

Now don't gorget, make sure you get your switch from Dick Smith and not that other distributor who sells it under a different name at about $30 or $40 more.



The Dick Smith Coaxial switch

ar

SEQATV Group Two-way Hook-up

LAMINGTON NATIONAL PARK 75TH ANNIVERSARY
RICHARD CARDEN VK4XRL
227 RODE RD
WAVELL HEIGHTS 4012

THE LAMINGTON NATIONAL Park is situated near the south-east corner of Queensland on the border of NSW. Within the National Park, there are two privately owned and run resorts, these being Binna Burra and O'Reilly's. The O'Reilly's Resort is known for its connection with the crash of the STINSON in 1937 when survivors were found by Bernard O'Reilly.

On Saturday 4 August 1990, the National Park celebrated its 75th anniversary. To mark the occasion, the Queensland National Parks and Wildlife Service arranged for events at both resort sites. The SEQATV Group was approached to provide a two-way hook-up between resorts. Initial testing was carried out by Richard VK4XRL, Brian VK4BDB and Bob VK4BOB some six weeks before the event to find out the feasibility of the required hook-up. These tests were carried out using 426.25MHz from Binna Burra to O'Reilly's. The test provided only a P3 picture, but moving the equipment at Binna Burra to behind the guest house improved the results to a perfect P5. The biggest problem was that a ridge runs between the two resorts. Also, at the Binna Burra site we could not provide any real height. Pictures were also exchanged with Brisbane on 426.25MHz with excellent P5 results.

Armed with this information it was decided to go ahead with the project. Richard VK4XRL detailed a plan and further tests were carried out some two weeks before the event.

The proposal put forward to the group by Richard was as follows:

(1) Binna Burra to O'Reilly's – 1250MHz FM-ATV
(2) O'Reilly's to Binna Burra — 444.25MHz ATV

and as an added bonus it was decided to feed this signal to the input of our Brisbane ATV Repeater VK4RTV.

Two 70cm antennas feeding a splitter unit were used to feed the 444.25MHz ATV signal to Brisbane and to Binna Burra. The 1240MHz FM-ATV equipment was built by Richard VK4XRL and provided the Binna Burra site with about six watts into a 30-element yagi antenna. The FM-ATV receiver was fed via a dual-quad antenna which provided a gain of about 10dB.

These tests were carried out on 15 July 1990, but a few problems had to be sorted out as the sites envisaged by the National Parks and Wildlife Service could not see each other. With some co-operation from the two guest houses suitable sites were found. Tests were carried out and provided P5 pictures to Binna Burra and P4 pictures to Brisbane via our Repeater. The 1250MHz FM-ATV link only provided a P3 picture with some fading. However, with co-operation from the resorts and the National Parks and Wildlife Service, another technical meeting was arranged and discussion took place on the problems at each of the sites. As no further tests could be carried out before the event a fallback situation also had to be planned. Three fallback situations were proposed:

(i) Provide a 579.25MHz feed from Binna Burra to O'Reilly's — this could have caused problems as we could already see our repeater at this site; however, we could use vertical polarisation — so with this in mind the DoTC was approached to use this frequency during the weekend.
(ii) Use 426.25MHz from Binna Burra to O'Reilly's — this was also a problem as we were also transmitting on 444.25MHz; however, with careful antenna aiming and a couple of filters it was felt that it could be done.
(iii) Use 444.25MHz or 426.25MHz from Binna Burra and O'Reilly's and switch off the TX system which was not being used at the time.

The main approach, however, was to proceed as in the tests but upgrade the 1250MHz FM-ATV link by increasing the output power to approximately 18 watts. This was achieved and tested the week before the event. Also Brian VK4BDB provided a second 30-element yagi from his antenna farm to receive the signal. Extra height was also provided at the receive end.

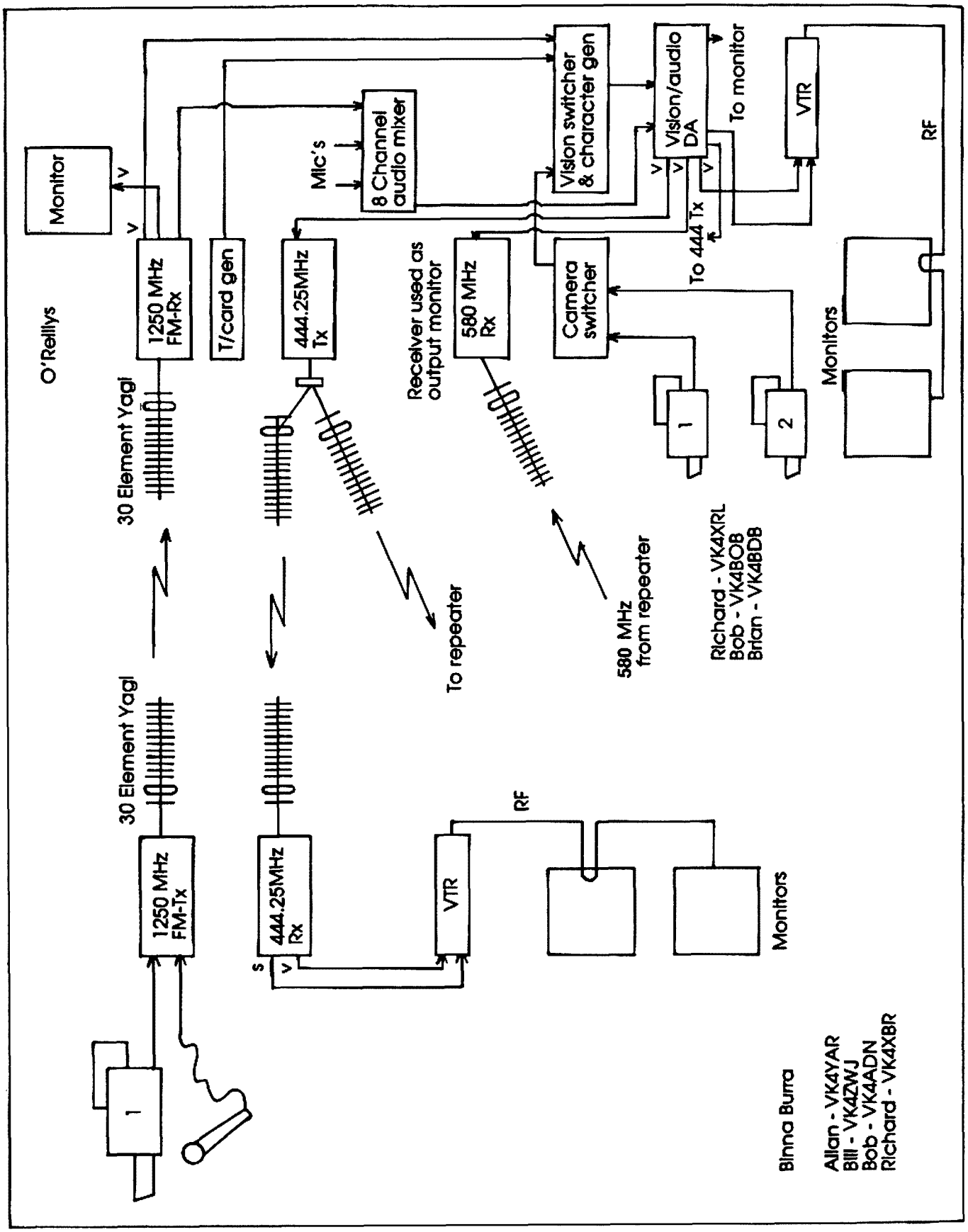
The block diagram shows the final set-up for the two sites. Continued transmission was to be provided from O'Reilly's with switching across to the Binna Burra site when required.

Setting up was carried out on Friday afternoon, 3 August, with perfect 1250MHz, 444.25MHz pictures between the sites and to our repeater in Brisbane. All events proceeded over the next few days without a single technical hitch, and VK4BTV closed down transmission on Sunday 5 August at 11.30am.

A great time was had by all but it could not have been done without the co-operation of the Resorts, National Parks and Wildlife Service, Rangers and the SEQATV Group. I would like to thank those at Binna Burra, VK4ADN Bob, VK4YAR Alan, VK4ZWJ Bill and VK4XRB Richard, and at O'Reilly's VK4BOB Bob, VK4BDB Brian and YL Robyn. Also, a special thanks to DoTC for approving the use of 579.25MHz ATV and for allowing the club callsign VK4BTV to be used portable from both locations. Thanks also to Don Marshall VK4AMA and the National Parks and Wildlife Service, Vince and Peter O'Reilly and the people at the Binna Burra Resort for letting us use their facilities.

Again, many thanks for an effort well done. **ar**

(See block diagram overleaf)


Monitor
V
V
Mic's
8 Channel audio mixer
Vision switcher & character gen
Vision/audio DA
To monitor
VTR
RF
V
V
V
To 444 Tx
O'Reillys
1250 MHz FM-Rx
T/card gen
444.25MHz Tx
Receiver used as output monitor
580 MHz Rx
Camera switcher
Monitors
30 Element Yagi
1
2
To repeater
580 MHz from repeater
Richard - VK4XRL
Bob - VK4BOB
Brian - VK4BDB
30 Element Yagi
1250 MHz FM-Tx
444.25MHz Rx
S
V
VTR
RF
Monitors
1
Binna Burra
Allan - VK4YAR
Bill - VK4ZWJ
Bob - VK4ADN
Richard - VK4XBR

Right Angled Delta Loops for 20m

FELIX SCERRI VK4FUQ
9 GARBUTT ST
INGHAM 4850

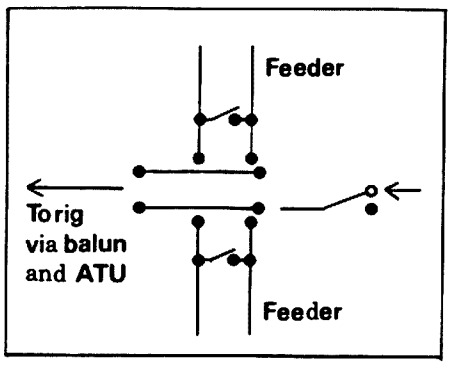
LOOKING THROUGH OLDER editions of *AR* and noticing many antenna contributions has prompted me to present an antenna article of my own. Only brief constructional details will be given, but it is hoped they will be sufficient. The antenna is basically a *"right-angled delta loop"* designed for the 20m band.

Essentially the title is self-explanatory. The array consists of two one-wavelength loops positioned at 90° to one another, the idea being that each loop is switchable at the ATU to give directional shift.

Each loop works individually. It is not a parasitic array. (Not a disadvantage as it turns out). At my Ingham QTH, the two loops are suspended between three pipe masts (about 38-40ft high), the centre mast being "common" (see diagram).

Incidentally, the masts were easily "walked up" into position by two people. Individual setups may make use of existing anchor points. Whatever is used, safety-first, please. I speak from experience. Three and three-quarter months in hospital ain't no fun!

The use of pulleys and polythene cord makes raising and lowering easy, and results in excellent electrical insulation. The lengths of the loops are given by the standard formula L(ft)=1005/ f(MHz). This is close enough. Use a GDO or noise bridge, if you want, but remember if you have to lower the loops to do measurements, then the apparent resonance will shift down about 150kHz. Be aware of this. Small plastic insulators are placed at the appropriate 1/3 points to provide connection points to masts and form the delta shape. Apply adhesive to the wire loop at the insulations to avoid slippage.



Switching system for feeders

Feed takes place at the bottom of the inverted triangle direct with 300 ohm ladder feedline. Various different feed points have been tried over the years, but bottom feed appears to give the best results. Once everything is in the air you should have two majestic loops at 90° to each other. As part of switching at station end, some means of "shorting" the feeder of the unused antenna should be incorporated to reduce interaction.

Another question may now arise. How much separation should there be between loop ends at that "common" mast? Tests seem to indicate the more the better, although interaction seems minimal when spacing is only 3ft or so from mast. Interaction between loops and the masts may also occur at close spacings. This, indeed, was the case at this QTH, resulting in some strange effects, including increased noise pick-up.

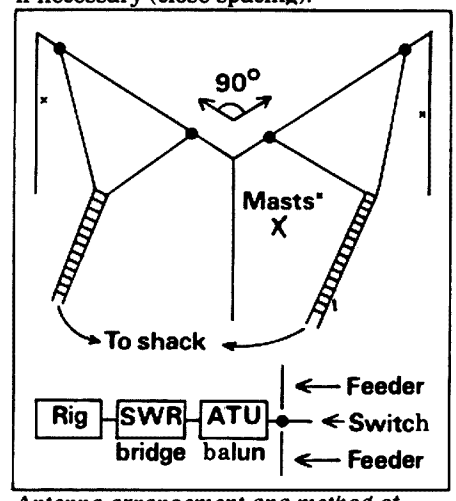
During recent experiments, an effective solution was found, although, to be quite honest, I can't say why. The use of "resonance breakers" in a variant form seems to work nicely. In my set-up, the breaker consists of an L-C network made up of a 200pF variable capacitor and a 2ft length of insulated wire, with two or three turns wrapped around the base of each mast, resonated with a dip meter to mid-band. These devices appear, somehow, to greatly reduce the mast/loop interaction quite conclusively, although the mechanism of operation is not clear.

Building the array is relatively easy; tuning it is the hardest part. In order to make each loop "track" with the other, when switching, it is necessary to use equal lengths of feeder to allow the same ATU setting on each loop. This can be something of a pain to achieve; perhaps the easiest way to do this makes use of the dip meter using one loop/feeder combination as reference, the "resonant" frequency is measured, then the other feeder is trimmed (or lengthened) accordingly, until a dip is noted at the same frequency. Very close "matching" can be achieved with patience. Note that the dip frequency may be nowhere near the true antenna resonant frequency, depending on feeder length. Such is the nature of open feeders (but they are great feedlines). Remember to use a good quality ATU and balun, correctly tuned to let the rig see 520 ohms unbalanced.

Final conclusions: How does it work? Bewdiful! The ability to switch direction instantaneously is enormously useful, especially if you participate in contests Apart from this advantage, in other respects the antenna is a superb performer. Transmission and receiving capabilities are very high indeed. Almost embarrassing actually, when reports you get are as good as stations using yagis and the like. Maybe that says a lot about the performance of the average yagi!

But, enough of that. I know this array is a fine antenna. Should you also build one, I know you will agree.

Note: Do not "hot switch" antenna
Use resonant breakers on mast bases, if necessary (close spacing).



Antenna arrangement ana method of connection

Getting Started with Amateur Radio Satellites

Part 2

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD
YARRAVILLE 3013

IN JANUARY WE COVERED some introductory topics and talked about terms like Doppler shift, polar orbit etc. Our flavour of the month satellite was DOVE and we set up a simple receive station to listen to the telemetry and digitalker. I hope you had some luck receiving its signals. there were plenty of opportunities and signals have been good.

The topic this month is orbital geometry and our flavour of the month satellite is UoSAT-2. Don't be put off by the geometry bit. I'm not going to send you all off back to school to study maths. It's just that there isn't any better way to describe it.

If you're going to pursue an interest in amateur satellites you'll need to get a clear picture in your mind of what's actually happening up there. Try to visualise the Earth as seen from the moon. Hold up a globe if you have one. Spin it on its axis. Imagine, or even make, a loop of wire about a centimetre bigger in radius than the globe. Put it around the globe so it passes over the North and South Poles. This represents the path of a satellite in a 'low Earth, polar orbit'. Think of the sun as being over at the other side of the room. Hold the wire loop steady and rotate the globe inside it, from west to east remember. As the satellite model makes its way around the wire it passes over a different part of the Earth on each orbit. If it's high enough, and they all are, it will 'see' every point on the surface of the Earth twice a day, every day. This is the big advantage of a polar orbit. No-one misses out. All the UoSats, all the microsats, the JAS (Japanese) and RS (Russian) satellites are in this type of orbit.

There are other advantages in using a polar orbit. The Earth orbits around the sun, I'm sure you're all aware of that. If we can organise the orbit of the satellite to creep a bit each day in the opposite direction, and if we can be really clever and organise this creep to be about one degree per day, then the sun is always going to 'see' the satellite for the same length of time each day. This is very important when the designers are working out how much power they have available from the solar cells. Such an orbit is called a 'low Earth, polar, sun-synchronous orbit'. It also means that the satellite will pass over the same places at roughly the same local times each day regardless of the seasons.

Our flavour of the month satellite, UoSAT-2, is in such an orbit. I've chosen it for a number of reasons. Like DOVE it's not a communication satellite. You can't talk through it. It's an experimental, educational satellite, and that's what we're on about at this stage. Uo-SAT-2 is the second in a series of these education-oriented birds which are being designed and built at the University of Surrey, England by a team of researchers headed by Dr Martin Sweeting G3YJO. The program began in 1979, and UoSAT-1 was launched in October 1981. Two more were launched in 1990.

These satellites have all sorts of clever stuff on board. Things like a navigational magnetometer for measuring fluctuations in the Earth's magnetic field. A cosmic dust particle detector, electron spectrometer and so on. Of more interest to us at the moment are the beacon transmitters.

These transmitters operate on 145.825MHz (same as DOVE), 435.025MHz and 2401.5MHz. The normal frequency is 145.825MHz. You can listen for UoSAT-2 with the same gear I described last month. Its orbital period is one hour, 38 minutes, 16 seconds at present. It comes around during roughly the same time window as DOVE. UoSAT's telemetry sounds similar to DOVE but the buzz is more regular and the off-times are shorter and less frequent. Like DOVE, UoSAT-2 has a digitalker. When it's operating it gives out telemetry data in a rather mechanical sounding voice.

Let's think now about the next best value upgrade of our simple satellite station. Probably the most valuable tool you could acquire would be a computer, but we're not far enough down the track for that yet. We first need to improve the strength and therefore the quality of the received signal. The best computer and decoder won't help if the signal you're receiving just isn't strong enough. Later on we'll be discussing techniques for extracting data from noisy signals, but there's a limit to everything. I think the next thing to do is to try your hand at tracking the satellite across the sky using a small, low-gain Yagi beam. This may seem a strange thing to suggest if you don't have a computer to tell you exactly where the satellite is in the sky, but read on.

A small, say five-element Yagi beam on 2m is easy to build. Any good antenna book will have details. I have one which I mount on an old photographic tripod, one with a ball joint mounted on top. By putting a small amount of tension on the ball joint, the beam can be aimed by hand anywhere in the sky, except perhaps directly overhead. You could even do that if you gave it a little thought.

The Yagi will give a valuable few dB of gain but will probably have a half-power beamwidth of 40 degrees or so. This will mean that pointing is in no way critical. You will easily be able to find the satellite and keep the antenna aimed at it by watching the S-meter or just listening to the signal. This can either be a two-person operation or you can take the receiver (and recorder; it's a good idea to record the sigs) outdoors. It's not a bad idea to get as close to the antenna as possible anyway. Keep the feedline as short as you can and, like I said last month, use your best co-ax.

You should be pleased with the improvement in the performance of your station now and with practice you ought to be able to get excellent signals down from DOVE and UoSAT-2.

I'm going to ask you now to go back to the globe of the Earth. I want you to start thinking about some other possible orbit shapes and their characteristics. Lots of commercial satellites are in low Earth, near circular orbits. Landsats, navsats, weathersats, SPY-SATS. Most are around 500 to 1000km altitude and have orbit periods of an hour and a half or so. If you

continued on page 18

Equipment Review
The Kenwood TM-701A and the TM-731A Dual Band FM Transceivers

RON FISHER VK3OM
GAALANUNGAH
24 SUGARLOAF ROAD
BEACONSFIELD UPPER 3808

That's right! Not one but two transceivers for our review this month; these are both dual-band FM transceivers that cover both the 144 to 148MHz and also the 430 to 440MHz bands. The 731A has a nominal power output of 50 watts on the 144MHz band and 35 watts on the 430MHz band, while the 701A has an output of 25 watts on both bands. However, back to the beginning. In the April 1990 issue of *AR*, I reviewed the TM-231A 2m FM transceiver. I guess the best way to describe the 701A is to call it a dual-band version of the 231A. It has the same general appearance and is of the same overall size. However, it does have two coax output connectors, one for each of the two bands. The LCD multi-purpose read-out gives all the information you might need, but it only shows the main operating frequency. The 731A, on the other hand, not only shows both the 2m and 70cm frequencies, it also has two S-meters. Just consider that — not even the new TS-950S has that facility! The 731A also has two coax output connectors, so you will need either two separate antennas or a diplexer if a dual-band antenna system with a single feeder is used. If you are a casual FM operator, the latter approach is probably the preferred way to go. By the way, if you have noted that the price of diplexers is rather steep, don't worry — I will be covering the construction of one in Random Radiators very soon. Total cost about $20.

With the bigger display and increased power output, the 731A is a bit larger than the 701A. In fact, it measures 150 x 50 x 219mm and weighs in at 1.8kg, compared with 140 x 40 x 200mm and 1.4kg for the 701A. Also for the extra size and cost, you get a few interesting features included. A squelch control for the sub-receiver and a balance control to set the relative audio outputs of each receiver. It is also possible to run two external speakers, one for each band. Without external speakers connected a mix of the audio is supplied to the internal speaker. Both transceivers have their internal speakers mounted in the top of the cabinets. I feel that, in general, this is the best place for them, although care needs to be taken when mounting the rigs in the car to avoid masking the sound.

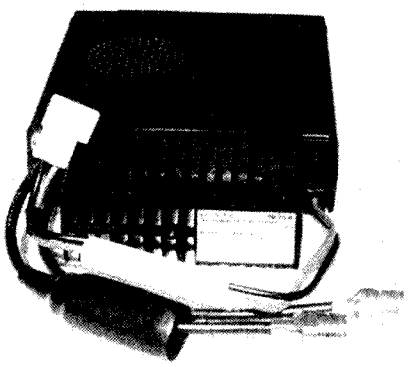
The TM-731A – a Closer Look

I will take each of the rigs separately and cover the various features that they have.

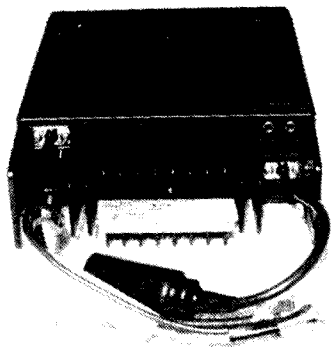
The tuning facilities on the 731A are very comprehensive. There are two tuning controls, one for main tuning and the other for 'sub' band tuning. This means that each band can be tuned independently of the other. These same controls are also used to select the memory channels when operating in the memory mode. Underneath the main tuning control are two up/down buttons which step the main tuning in one MHz segments.

Tuning steps can be programmed for 5, 10, 12.5, 15, 20 and 25kHz, with a separate choice available for each band. Thirty memory channels are available and these are divided equally between the two bands. One of the memory channels on each band is allocated as a call frequency. Memory channel 'one' is allocated for the special alert function. If your call channel corresponds to the one you require the alert function to be on, then you will have to have the same frequency in two memory channels. This means that you might well run short of memory capability. It seems odd that many handheld transceivers can run to 50 or even 100 memories, and yet a full-featured transceiver has only 30 (or less). Some of the memories are also designated for other uses, such as band scan limits and offsets other than the standard ones.

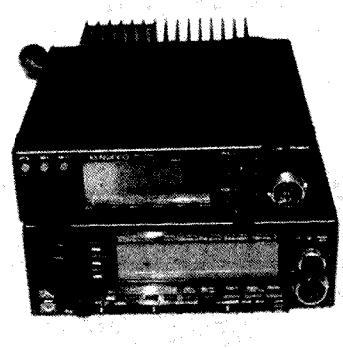
Many of the control buttons are dual purpose, with the second function coming into use with the operation of the function button first. Luckily, most of the



Rear view of the TM-701A. Dual coax output leads can be seen which are not identified on the name plate.



Rear view of the TM-731A. Note the two speaker output sockets at top left.



The smaller TM701A on top of the TM-731A note the relative sizes.

'second' functions are of the set-and-forget type. In general, the ergonomics are very well thought out, but the combination of small buttons, small labelling and my bi-focal glasses made it rather hard to hit the right button every time. No doubt, given time, I would have become familiar with it all. The microphone supplied with both rigs is one that has come in for some adverse comment (not from me). It has a 1mm hole for the microphone acoustic input. It has been said that this is too small. I did many tests and comparisons with other Kenwood microphones and must say that it came out sounding better than most.

Power output on transmit was well up to spec on both bands, but it was interesting to note that the current drain was higher on 430MHz, despite the lower power output, indicating a somewhat lower efficiency on the higher band. The output was well maintained right across both bands.

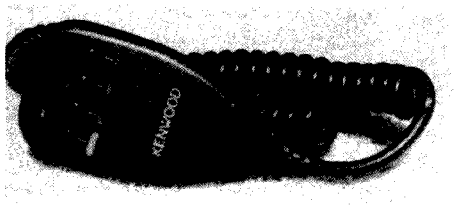
Current drain	146MHz	435MHz
	7.6 amps	8.6 amps

In the lower power position, the power output was just on five watts on both bands with a current drain of 2.7 amps on 146 and three amps on 435MHz.

Receiver sensitivity appeared to be excellent, with only 0.1μV input required to produce a 12dB sinad on 146MHz. As I am not blessed with a signal generator covering the 430MHz band, I can only guess, but it appeared to be just as good, easily beating my old (and little used) transceiver. No reciprocal mixing problems were noted on either band and, as I have a police UHF repeater less than 100 metres from my antennas, this certainly indicates first-class front-end performance. Receiver audio power output was measured at 2.9 watts into an 8-ohm load and a very healthy 4.8 watts into a 4-ohm load. Audio quality was good, but with a little less low frequency response than I have found with Kenwood VHF gear previously.

The 'S' meter was checked on 146MHz only, and it was noted that 14dB increase in level was required to go from S1 to S9 with another 6dB required to get to the top of the '+' section. This is certainly better than most, but don't give antenna reports on the basis of 6dB or even 3dB per 'S' point.

With the ability to transmit on one band and listen on the other at the same time, you are set for versatile operation. Just one point, however. If you intend to do much duplex operation, headphone use is almost mandatory. Perhaps on the next model, Kenwood might like to consider putting a 3.5mm stereo headphone socket on the front panel.



The somewhat controversial microphone which we found to work very well. Note the remote control buttons.

The TM-701A — A Closer Look

Basically the 701A is smaller, has less power output and a few less features compared to its big brother. Let's see first off what you don't get. As mentioned earlier, the read-out is much smaller. The second, or sub-frequency, read-out is not provided, neither is the second 'S' meter. The transmitter power output is lower on 144MHz, 50 watts down to 25 but, in fact, is not that much lower on 430MHz, 36 watts down to about 25 watts. Not enough to make any real difference. The sub-tuning control, the audio balance control and the sub-band squelch control are all missing. However, there is one thing the 701A has that the 731A does not have: a power on/off switch which is not combined with the audio gain control. You can leave the audio set to a suitable level — very handy.

The 701A also has that handy facility of being able to select the VFO tuning rate. I feel that the 25kHz rate is the best choice as it fits our band exactly.

With the rig on test, I was unable to pick very much difference between the two rigs apart from the higher power output of the 731A. The specification of the 701A indicates that the receiver sensitivity is a fraction down on the 731A. However, my rather ancient test equipment was unable to pick this up. On-air tests were unable to show up any detectable difference in receiver performance between the two rigs. Probably the main difference is the ability of the 731A to receive two bands simultaneously. The 701 does not include this feature. On VHF/UHF this is not quite the same as the new dual-frequency HF transceivers, because I would guess that most amateurs would use the facility to perhaps monitor a simplex or repeater channel waiting for an unexpected call to come along. If you can listen to and comprehend two transmissions at the same time, you are better than I am.

Of course both rigs are capable of operating in full duplex mode. In other words, you can transmit on one band and receive on the other at the same time. One thing that might deter this, however, is the transmit duty cycle, which is rated at one minute transmit to three minutes receive. I feel that this might be a bit on the conservative side, but both rigs do get hot after a few minutes of transmission. If you intend to operate duplex, it might be a good idea to let the button go from time to time.

Kenwood offers a wide range of optional equipment to complement the two transceivers. There is a variety of external speakers suitable for both mobile and fixed station applications. There are also AC power supplies available, but actually all are designed to match HF equipment. While quite suitable electrically, they do not match the colour or appearance of these transceivers. There is also the interesting RC-10 remote control unit. The photos I have seen of this seem to make it look like a cellular phone unit. Buy one and impress your non-technical friends. But I feel it could actually be a very useful thing to have. What about sending one down for us to review one day?

The Instruction Manuals

Unlike the TM-231A, reviewed April 1990, the books for our review transceivers were not published in six languages — only English. Again the technical information is very limited, with only a circuit diagram included. I know that we reviewers keep on about this, and I hope that one day we might see some results. There is no doubt that some manufacturers are better than others but, in general, the instruction books are aimed at non-technical buyers. No doubt, Kenwood will have a full service manual available as an option, but often these are oriented quite the other way. In other words, if you are looking for basic adjustment information it's hard to find the trees for the woods.

The TM-731A and the TM-701A Conclusions

It's an interesting choice. If you require a full-featured dual-band transceiver, one that can produce double talk and even have dual 'S' meters to tell which is which, and one which feeds the double talk to separate speakers (now single talk twice) then the 731A is for you. However, if you are normally a 2m operator who would like to keep up with what's going on on 70cm, then maybe the 701A is the one for you. Both are rather short on memory space; a thing that I find strange in this day and age. For the features included, both represent very good value. The audio quality is, as usual, pure Kenwood — in other words, the best in the business. I would be happy to recommend either transceiver.

My thanks to Kenwood Electronics Australia for the loan of the review transceivers. If you require more details on price and delivery, you should contact Kenwood or one of its local agents. ar

Amateur Radio and the Persian Gulf

ERNEST HARPER VK6TN
17 DALEVIEW CL
GLEN FORREST 6071

RECENTLY AMATEUR radio has been used to help out in the conflict in the Persian Gulf.

WA5DXP Jim, a friend of mine who was a radio officer on board a cargo ship plying between the US and Japan, suddenly went off air after being a daily AMTOR contact. W5KSI Angelo, living in New Orleans, Jim's QTH, was also a daily contact with me here in VK6. He told me that Jim had been drafted, so it was a surprise when, on 12 November 1990, I received a call from Jim; not a good link, but he managed to tell me that he was a radio officer aboard the American hospital ship *USNS Comfort*.

The next time Jim WA5DXP managed to link with me was to my mailbox on 13 and 15 November 1990, short path from the Gulf. Conditions were good, but a link was hard to establish. I suggested that he check his delay timing as it seemed to be out. The next contact with a very good link was on 21 November 1990 at 1700 UTC. This again was a message into the mailbox. However, unlike the past contacts, this one was good and traffic smooth. According to Jim, it was the navy radio gear that he had been using which wasn't up to the faster switching time required for AMTOR, and he had now been given permission to use his own rig, which he had taken with him.

In my contact with WA5DXP on board ship at 1945 hours UTC on 23 November 1990, the link was very good and traffic flowed very quickly. Jim proceeded to tell me what was happening on board about third party traffic to the States. It seems that three radio hams were drafted from their jobs to be part of a team aboard the hospital ship *Comfort*. Their jobs were the manning of normal ship's radio communications including satellite communications between ships, and the passing of 'third party' traffic from the ship's crew and their families via hams in various part of the US and other countries. Jim was already passing messages for his wife in New Orleans via my mailbox and W5KSI, who collected them each day. The ship's captain authorised times for traffic to be sent either AMTOR or SSB. Authority for third party traffic was allowed only while the ship was at sea When the ship was positioned back in Bahrain, no amateur traffic was allowed from the ship.

Jim also told me that there was an Australian medical detachment aboard his ship which would like to pass traffic to relatives in Australia, and could I find out if it was possible to pass traffic? I decided to ring the PR officer at Garden Island here in Perth to make sure I wasn't breaching any security regulations about the detachment over there. The PR officer said he would check and call back, which he did about 15 minutes later, saying there had been a press release about the medical detachment on 6 September 1990, and therefore there was no secrecy involved. However, at 1430 hours local time, I received a telephone call from the Department of Defence (Security) advising me NOT to proceed with any passing of traffic from the Australian detachment to anyone in Australia. The main reason given was that traffic could be intercepted by parties unknown and information of telephone numbers, addresses etc could be used to trace the families, and methods of harassment would or could be used against them. On passing this information to Jim WA5DXP, it seemed that the ship's captain could not understand why the Australian detachment was to be penalised by not being allowed by the Australian authorities to use the system provided for them. The only other contact the Australians had was by telephone using MARISAT communications, costing them approximately $9 per minute, which they had to pay personally.

On hearing from Security the advice not to proceed with the third party, I then decided to speak with the president of the WIA West Australia, VK6KWN Alyn Maschette. Alyn rang the DoTC and tried to contact the Minister of Defence, but was advised by the Department to put it in writing. This was done without delay; a letter was sent to Senator The Honourable Robert Ray on 25 November 1990, advising the Minister of our problem, with a copy to the DoTC for information.

Daily telephone calls to the Department of Defence (Security) here in Perth, asking if any decision had been passed to them from Canberra, became routine — 'Sorry, nothing yet." On 30 November 1990, Jim again called me from the ship (he had been off air while the ship was in dock taking on supplies). This contact was on SSB as he was at the time passing messages via phone patch to the US. During a break he asked for a progress report, referring to the long-awaited authority to go ahead with phone patch for the Australians aboard. When I advised him that there had been no reply, he said that the detachment commander was most upset and that the ship's commander had sent a signal to Canberra to chase it all up.

The next day while in contact with the ship on AMTOR, I suggested to Jim that we should devise a code for him to pass me the telephone number of one of the nurses from Perth and, during the next few nights' contact, I eventually had the telephone number and name of the nurse. I rang her mother here in Perth and suggested that she and her husband came to my home for a chat. That night they arrived and made a tape recording for their daughter, who had been making arrangements for her wedding in Perth prior to her going to the Gulf. These arrangements had been postponed. During my contact the following morning, I passed the tape over the air to Jim, who recorded it and passed it over to the nurse, Captain Marina Godfrey, who was thrilled to hear her parents on tape with information about her new wedding arrangements.

Then Jim went off air again until 16 December 1990, for operational reasons. During this time, I asked around if anyone could lend me a phone patch. Dave Wallace VK6IW had a Yaesu SP101 which he said he wasn't using and was mine for as long as I needed it. On 17 December 1990 I was awakened by my "sysop" alarm at 0400 hours local. I staggered out of bed to find Jim was calling me in AMTOR and asking me to go to SSB. On SSB he asked if I could call Marina's mother and patch her through to the ship in 15 minutes time. Well, it was a very surprised mother who woke up to my telephone call at that time, but so pleased, and the call came through with perfect copy. Marina was

able to talk with her mother about all the wedding arrangements etc. After 15 minutes we cut the link to allow other calls to be made to the US for other members of the ship's crew.

Various contacts were made with Jim up to 21 December 1990, then communications were once more restricted to operational use only, and were not continued until another call came early morning on 11 January 1991, again over AMTOR. This time Jim advised that, as from 2359 hours UTC 11 January, all amateur communications would be discontinued as the ship was on operations only. I did get to communicate with the new Australian detachment commander for 20 minutes on the keyboard (AMTOR) while Jim was checking out some other calls on MARISAT. Then Jim gave me his thanks for all the help, and we signed off with my best wishes for him and the ship's crew from all here in Australia.

We all know that the allied bombardment started on 15 January 1991, and yes, on 17 January 1919, Alyn VK6KWN received a letter from the Acting Minister of Defence, Gordon Bilney, dated, yes you're right again, 15 January 1991. This letter stated . . .

. . . *"Subject to Minister Beazley's approval, the use of radio facilities on board* USNS Comfort *by Australian personnel, and the conditions under which the radio station is operated, are matter for the ship's commanding officer and the United States Navy. I would expect Australian Defence Force personnel serving on board to comply with USN requirements, including security requirements."*

For those of you who may be wondering why I bothered to check with the Navy before going ahead with the third party calls, (as an ex-serviceman I had this feeling), let me now quote part of the letter received from the Minister of Transport and Communications, Kim Beazley . . .

. . . *As you correctly point out, under conditions applying to the Australian Amateur Service, communications between amateur stations located in Australia and authorised amateur stations aboard vessels, including warships, are permitted. The Third Party Traffic Agreement between the USA and Australia would enable members of the Australian Medical Team serving on the* USNS Comfort *to pass messages back to their families. Nevertheless, where the operation of an amateur station involves military personnel on active duty, the final decision on whether or not such facilities may be used rests with the relevant defence authorities. I understand that in this instance Australian Defence Force personnel would be expected to comply with all US Navy requirements. Subject to the requirements of the vessel's commanding officer and the US Navy and the Australian Department of Defence, there are no reasons which would prevent the Australian Amateur Service from providing communications facilities for these particular members of the Australian Defence Force.*

It seems ironic, now we have the authority to proceed, that radio silence has been enforced until all hostilities are over. However, at least one nurse was able to use the facility to her parents here in Western Australia before her term of duty expired and, having come safely home, did come and pay a visit to my shack to thank me and the WIA for all our efforts on their behalf. I now await the cessation of hostilities to once again contact Jim WA5DXP, WA1QKW Ralph, and W4CQC Don, to know they are all safe again and on their way home.

ar

Getting Started with Amateur Radio Satellites – Part 2 *(continued from 12)*

have a scanning receiver you could listen for some of them. I'll cover them in a future article.

Rotate your wire orbit model 90 degrees so that it's now around the equator. Move it back towards the poles about 30 degrees. This orbit has an INCLINATION of 30 degrees. That is, its plane has been rotated 30 degrees from the equator towards the poles. The idea of inclination is an important one to get clear in your mind. When we look at computer programs this is one of the critical elements we must update to keep our programs accurate. The space shuttle is in such an orbit. Its inclination is generally around 28 degrees. The Pakistani satellite BADR-1 also had an inclination of about 28 degrees. From the visualised or real model it will be seen that a satellite in this type of orbit does not by any means cover all the Earth. In southern Australia, for example, we would only ever see such a satellite pass low across our northern sky. It would never get more than 20 or 30 degrees above our horizon. Stations in Scandinavia or Patagonia would never hear its signals.

Now here's another important term you'll need to become familiar with. The part of the Earth that the satellite can 'see' is called its FOOTPRINT. The lower the altitude of a satellite, the smaller its footprint will be. No matter how far away a satellite is, it can never see a complete hemisphere. Think about it. Even satellites like AUSSAT that are in a geo-stationary orbit get close but, no cigar.

Now that geo-stationary term slipped right past. Let's get it back and have a closer look. Without invoking Kepler and Newton's laws you can take it from me that the closer a satellite is to the Earth the faster it must go to stay in orbit. If you would like an analogy, think of a tennis ball on the end of a piece of string. Whizz it around your head. Shorten the string and see what happens. Don't try it with a cricket ball!

For example, a satellite at an altitude of 1000km would need to be whizzing around the Earth 13.5 times per day. At 277km altitude it would be going around 16 times per day and that's about it because if it was trying to remain aloft by going around 17 orbits per day it would only be about 13km above the surface of the Earth! It would have burned up long ago. Going out to the other extreme, the moon at a distance of about 380,000km takes 28 days to orbit the Earth. Somewhere in between there must be an altitude which will support a satellite doing one orbit in exactly 24 hours. This turns out to be about 36,000km. If the satellite is moving in the same direction as the Earth and it is orbiting around the equator, it will appear to hang motionless in the sky. It will always be in the same spot to any observer, anywhere. This is called a geo-stationary orbit. Many commercial satellites are in this type of orbit. Things are quite crowded in the 36,000km circle around the equator, particularly over Europe and the USA. Real estate up there would probably put bayside property prices to shame.

It is very expensive to place a satellite in geo-stationary orbit. There are no such amateur satellites . . . yet. But they are being planned.

Next month, a look at amateur communication satellites and the next upgrade of your station.

ar

Have you advised the DOTC of your new address?

SEAnet '90 — The Continuing Saga

DAVID RANKIN 9V1RH/VK3QV/9M8QV
PO BOX 14
PASIR PANJANG
SINGAPORE 9111

THE STORY CONTINUES. Nearly 200 radio amateurs, wives, families and friends enjoyed themselves over the weekend of 9-12 November 1990 at the 18th meeting of the SEAnet Convention. The host society was MARTS, the IARU Member Society for Malaysia, but the venue was Kuching, the capital of the state of Sarawak. Sarawak is located in East Malaysia, and Kuching is around 780km east of Kuala Lumpur as the south-west corner of the island of Borneo. Radio amateurs know the place at 9M8-land.

Reports on earlier SEAnet Conventions have appeared in *AR*, and it is with the hope that further publicity will encourage greater Australian participation that we again report on this fun activity. If you haven't visited Thailand before then maybe you will have a reason — or excuse — to in 1991.

Members of the recently formed Sarawak Amateur Radio League — SARL — formed the organising committee and did a magnificent job of keeping all the attendees happily occupied for the entire weekend. For most delegates it started on the Friday evening and finished on the Monday morning. For some 20 hardy souls it finished even later in the week. But more of that anon.

For those overseas amateurs suitably qualified, and so inclined, it was possible to obtain a 9M8 callsign for the duration of the convention, one indication of several of the ways the Organising Committee had gone about its task of approaching the appropriate authorities to obtain useful concessions. Needless to say there was quite a spate of new calls heard on the especially installed 147MHz repeater, with some new calls appearing on the HF bands as well. Believe it or not, but 9M8 was also on Moonbounce and Satellite as well as on 50MHz (9M8SEA). The operational side of amateur radio was certainly well catered for.

A Technical Symposium under the chairmanship of "Jumbo" Godfrey ZL1HV was held on the Saturday afternoon. Five papers on various topics were presented:

1. "Telecommunications in Malaysia".
   Speaker: Tuan Haji Hod b. Parman, Assistant Director-General of Telecommunications, Malaysia.
2. "Advancement of Amateur Radio in Japan".
   Speaker: Mr M Fujioka JM1UXU on behalf of
   Mr S Hara JA1AN, President, JARL.
3. "Amateur Radio in Malaysia".
   Speaker: Mr D D Devan 9M2DD — Director IARU Region 3.
4. "A Demonstration of the IPS Advanced Stand Alone Prediction System (ASAPS)".
   Presenter: Mr Geoff Robinson, IPS Radio and Space Services, Australia.
5. "Amateur Radio and You".
   Speaker: Mr D H Rankin 9V1RH/VK3QV/9M8QV
   Chairman, IARU Region 3.

These papers held the attention of the more scholarly inclined.

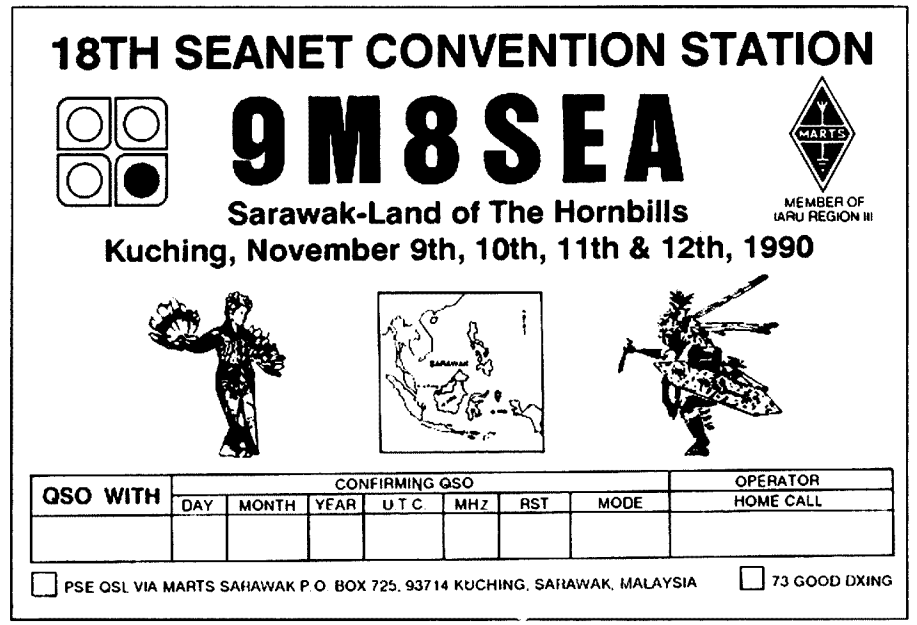
The social side was not overlooked either as the dinners and tour program show. Sumptuous meals, usually Chinese style, with breakfast taken each morning "alfresco" beside the river made sure that none went hungry. Local dignitaries were honoured guests at the evening functions which ensured that they received a first-hand exposure to amateur radio. A number of these guests expressed their surprise at the number of different countries represented within our group — some 16 countries, in fact. They were impressed.

A Sunday cruise, complete with lunch on board a luxury motor cruiser, followed up by a tour of the Sarawak Cultural Village was a most pleasant diversion from the hard work of 'eyeball' QSOs in different languages.

The official headcount as given by Festus Havelock 9M8FH was 191 licensees with the largest contingent not surprisingly coming from Malaysia. The grand total was 91, but it is interesting to note that there were 30 from Sarawak 9M8 itself, and nine from Sabah 9M6. The balance of 52 came from peninsular Malaysia 9M2. Now, as any dyed-in-the-wool DXer will tell you, it is not all that easy to work either 9M6 or 9M8, simply because there are not all that many of these guys or gals around. Let us hope with all this activity with SEAnet there will be some more 9M stations on the HF bands.

The second largest contingent was from

(continued overleaf)



A Message from War-Torn Kuwait

By Jim Linton VK3PC

A ROUTINE READ through an AMTOR mailbox by John Hill VK3WZ found an interesting message from Kuwait, which resulted in him having a hectic two days dealing with the news media.

The invasion by Iraq in August last year of neighbouring Kuwait resulted five months later in the Gulf War. A coalition of some 27 nations was enforcing a United Nations resolution that force be used to get Iraqi troops out of Kuwait. During the first week or so of the Gulf War, constant reports were on news services, including accounts from the Iraqi capital of Baghdad — but little had been heard from Kuwait. Then, via AMTOR, came news of Iraqi soldiers begging for food, and how terrified residents in Kuwait were coping with the war.

John Hill considered this amateur teletype message sent by a Russian radio amateur in Kuwait was newsworthy. He contacted Channel 10, which soon had a news crew at his home to film an item for its news bulletin.

John, in the meantime, contacted the WIA Victorian Division seeking help to achieve a much wider media coverage of the message from Kuwait. This resulted in the story being sent to radio, television and newspapers throughout Australia — and the international news services. John VK3WZ was kept busy with a string of media interviews. An excellent story appeared on page three of the Melbourne *Herald-Sun* in both its morning and afternoon editions.

In his shack is John Hill VK3WZ where he received an internationally newsworthy message from Kuwait during the early days of the Gulf War. (Picture courtesy of Berwick City News).

A local suburban newspaper, the *Berwick City News,* saw this story and decided to do its own version. A reporter had arranged an interview with John at his home — and to help, some background information on the hobby of amateur radio was faxed in advance to the journalist. An excellent story with a photograph shown here appeared on 24 January in the *Berwick City News.*

The outcome of the public relations exercise has been some excellent publicity for our hobby. Congratulations John Hill VK3WC — for helping give amateur radio much needed positive and accurate exposure in the news media. **ar**

SEAnet '90 *(continued from page 16)*

9V1 Singapore, with 33, then the Japanese with 28. Eight and a half amateurs and spouses from various parts of Australia participated; four and a half from VK3, two from VK6 and one from VK8. What happened to the guys and gals from VK1, VK2, VK4 etc, etc? Anyway, how come half a representative? Well, the author claims membership status for both VK3 and 9V1.

A number of presidents of IARU member societies were present — Brunei, Malaysia and Thailand, with President Hara of JARL being represented by Masayoshi Fujioka JM1UXU. In addition, IARU President Baldwin W1RU, IARU Region 3 Chairman 9V1RH and Director Devan 9M2DD attended.

For those with the time, inclination and ability to "rough it out" for a few days, a DXpedition to the Mulu Caves in Northern Sarawak was available. Operation from 9M8ULU took place and a series of adventures really makes this part of the trip a separate story.

All in all, an excellent function organised by a great group of amateurs and aspiring amateurs.

SEAnet continues to operate on 14320kHz +/- QRM every evening at 1200 hours Zulu with rostered net control stations — NCS — such as Albert VK6UA, Hassan V85HG, Ben VK6XC and HS1BV on hand to keep matters running smoothly. Join us on the air sometime and then plan on being in Chiang Mai, Northern Thailand next November for an in-person meeting. Information can be obtained from the IARU host society RAST at GPO Box 2008, Bangkok 10501, Thailand. NCS Albert VK6UA or Ben VK6XC should be able to give some information over SEAnet. So plan now to meet in Thailand in November 1991. **ar**

The History of the WIA Journal — Part 2

COLIN MACKINNON VK2DYM
52-54 MILLS RD
GLENHAVEN 2156

Continued from Amateur Radio January 1991 Page 21.

From the issue of December 1930, *QTC* was sub-titled "The Proceedings of the Wireless Institute of Australia", a move to upgrade it into the realm of professional bodies such as the English and US Institution of Radio Engineers, which both published "proceedings". *QTC* continued till November 1931, when Leo closed it down, following the decision of the Eighth Federal Convention to make another magazine the official WIA publication, a matter that is discussed later. *QTC* was resurrected some time later as the newsletter of the WIA, Queensland Division and continues to this day.

We now have to backtrack a little to October 1927 when, following problems within the WIA in NSW, amateur radio operators took the lead set by Queensland and formed the New South Wales Radio Transmitters League. The NSWRTL published its own monthly magazine, called *CQ*, from December 1927. It was free to members and edited by J M Bristow 2ZX. The secretary was J Young 2JY, and publicity officer was Don Knock 2NO. Don was also involved in a number of other early wireless publications. *CQ* started with 12 pages containing technical and gossip items and grew to 16 pages. It was small, about 20cm x 13.5cm, and professionally printed with a two-colour cover. The magazine was subsidised by Philips Lamps (A'sia) Ltd, and each issue included information on Philips products.

By August '28 *CQ* was sub-titled "The Acting Official Journal of the Australian Radio Transmitters League", because of support from the other states. But, also in August, the Australian Radio Transmitters League was officially formed with Queensland as its headquarters, so, instead the Queensland magazine *QTC* became the official journal.

When the ARTL and the WIA eventually negotiated a merger, the NSWRTL was recognised as the WIA NSW Division, so the September '29 issue of *CQ* was able to proclaim that it was now "A Magazine issued by the NSW Division of the Wireless Institute of Australia".

Reverting to the Sixth Federal Convention of the WIA in Brisbane during September 1929, NSW proposed that *CQ* be adopted as the official organ for the WIA and Philips agreed to publish the magazine for a period of at least 12 months and would issue up to 1500 free copies of *CQ* each month to all Institute members and nominees. The Institute was to provide a capable editor and all subject matter, but Philips wanted to publish at least one article in each issue describing Philips products.

At this represented a "donation" worth at least 500 pounds per annum, the offer was accepted. Mr Leo Feenaghty, who was the editor of *QTC*, agreed to relinquish publication. It was proposed that the official magazine be renamed *QTC* and that Leo should continue as editor of the magazine, with Phil Renshaw 2DE, the Secretary of the WIA NSW Division, as the assistant editor.

Philips was opposed to changing the name, and discussions with the WIA Federal Executive in Melbourne broke down, causing Philips to retract its offer completely and withdraw funding from *CQ*. Without financial support *CQ* could not continue, and ceased in early 1930, after three years of publication.

The paragraph heading describes these as turbulent years, and now we come to yet another publication which had some claim to official WIA status.

G A Taylor, who was a leader in early wireless organisations, was the editor of the *Radio Journal of Australia*, a short-lived weekly magazine which commenced in late November 1927. It had the imposing sub-title of "Official Journal of the Association for Developing Wireless in Australia, Wireless Institute of Australia NSW Division, Listeners' League (NSW) and Others". With the loss of *Radio Broadcast* as the official WIA magazine, the WIA NSW Division had appointed the *Radio Journal* as its official journal in early November '27, prior to the first issue.

As mentioned, Taylor was very active in wireless matters and was the president of the Association for Developing Wireless in Australia. This organisation was a lobby group to promote commercial wireless for listeners and to give support to manufacturers, and the journal was the magazine of the association. It contained weekly radio programs and news from listeners and amateur clubs, as well as news of the WIA NSW Division. The secretary was Norman B Rydge of later publishing fame.

The magazine's first issue was in November 1927 and it ceased publication a few months later with the March 1928 issue. By that time the WIA in NSW was virtually defunct anyway.

The next magazine to feature in WIA history was *The Radio Review of Australia*, published by Oswald F Mingay. Mingay was an early amateur (callsign 2XX) and one of the pioneers in radio development in Australia through to WWII. Depending on one's outlook he was a benefactor to the amateur movement or an opportunist who sold out the WIA!

This particular magazine was his first of many ventures in publishing, and had "the aim of presenting a record of radio engineering in Australia". The first issue was in April 1931, with 50 small pages for 1/- and was published by Mingay on behalf of Australian Radio Publications in Sydney. At the time Mingay was secretary of the NSW WIA and, whilst supporting the WIA, the magazine was privately owned by Mingay.

It listed as part of its contents "Proceedings of the Wireless Institute of Australia". Perhaps someone objected to the scope of that claim to represent the WIA Australia wide, because the July '31 issue only asserted to present the 'Proceedings of the WIA (NSW Division)". The magazine contained highly technical detail of commercial wireless equipment and installations, very similar to the format of the later proceedings of the IRE. With the October '31 issue the name was changed to *Television and Radio Review* and the price reduced to 9d, although the number of pages dropped to 34, with eight pages devoted to the amateurs.

At the Eighth Federal Convention of the WIA, held in Sydney during October 1931, it was finally agreed that this magazine, *Television and Radio Review*,

would be the official organ of the Wireless Institute throughout Australia.

Remember that in the period from July 1927 to June 1929, the typed and roneoed 12-page leaflet *QTC* had been the Queensland amateur journal and then from July 1929 it became the Official Organ of the WIA. The Eighth Federal Convention considered that the appearance and scope of the Institute's journal should be improved and Mingay offered to include *QTC* as a supplement in his magazine and to change the name to *Television and Radio Review and QTC,* with the hope that Leo Feenaghty would continue to edit the QTC portion. Feenaghty declined and suggested that from December 1931 *QTC* would cease and all subscriptions would be transferred to the *Television and Radio Review.* Whilst not wishing to work for another editor, Feenaghty did in fact contribute an article to this new WIA magazine.

Television and Radio Review of Australia (note another name change) of December '31 now proclaimed that it was the "Official Organ of the Wireless Institute of Australia", with Mingay as managing editor and R Chilton VK2RC as his assistant editor. Each issue contained about one page of WIA news from each Division.

Two worrying events for amateur transmitters occurred around this time. Firstly it was ruled that the Electrical Contractors and Electricians Licensing Act, 1924-28, prohibited **anyone** working on electrical apparatus unless they had a licence. To obtain a licence one had to have served an apprenticeship and be currently working in an approved firm in the electrical industry. This meant that radio traders, technicians and servicemen who were self taught and/or worked for non-approved firms could not install wireless sets etc, and amateur experimenters were to be prevented from modifying or working on their own apparatus. Secondly, the committee of the WIA NSW Division started moves to make the WIA a professionals-only organisation. An editorial in the January '32 issue of the WIA magazine sums up the tone of the WIA committee:

"At the moment, the majority of the members throughout Australia are experimenters and amateur transmitters. In fact, the latter are possibly the greater in number . . . it may be claimed that they indulge generally in transmitting activities and do very little in scientific development of the art or carry out organised work in accordance with the conditions of their licence . . . Therefore, why should the Institute be in the main a transmitters' body instead of an Institute including all those men professionally and otherwise interested in the technical progress of wireless."

The crunch for amateurs came in February 1932 when the WIA NSW Division was officially renamed the Institute of Radio Engineers and, despite being in the majority, the amateur transmitters of NSW were disenfranchised, their assets taken away and they were offered only a meeting place for "listening to interesting lectures". There were the words of Mr E T Fisk, elected first president of the IRE, in his annual report of the Institute of Radio Engineers for 1932:

"The leaders of the Wireless Institute were interested in the encouraging of a consideration of the wider scope of wireless activities. As a result, the IRE absorbed the Wireless Institute in New South Wales and the first meeting of the combined council was held on 4 May 1932, when it was decided to finalise the transfers of all the applicant members of the Wireless Institute . . . In order to provide a meeting place and to encourage the attendance of people who were not essentially technical trained engineers, but still interested in the technical application of wireless, the council decided to form the Radio Society of Australia, and this will be developed to a greater extent in the early future."

Wow! Little wonder that all those non-professionals who enjoyed amateur radio as a hobby felt they had been sold down the river and treated in a condescending manner. It must be said that a vote of NSW members had been taken in February '32 which was 79 to six in favour of the council recommendations, but subsequent events showed that the amateurs had been apathetic, didn't bother to vote and hadn't understood the implications of the vote anyway. The other states had been expected to be part of the change but decided not to participate. (That was probably very wise!)

The aggrieved amateurs who were no longer acceptable to the "professional" IRE, following its absorption of the WIA, quickly formed the Association of Radio Amateurs (NSW), which established close links with the surviving WIA Divisions in other states and eventually, in 1937, it was able to retrieve the registered name of WIA, NSW Division. Further information of these events from a different viewpoint is presented in *Amateur Radio* January '85, pp 6-9. F Goyen VK2UX became the first president of the ARA, in 1932, with Ray Carter VK2HC and C Bins VK2BJ as vice-presidents. Incidentally, the prohibition of amateur construction did not eventuate despite heavy lobbying by commercial and professional vested interests.

Relations between the WIA in other states and Mingay were distinctly cool (to put it mildly) and there was a problem with his continued publication of the official organ of the WIA. That was neatly solved by Mingay ceasing publication of *Television and Radio Review* with the January 32 issue, Vol 1 No 9. It had been the official WIA journal for only two issues!

In February '32 an announcement appeared in the magazine *Radio Monthly* as follows:

"As from this month (February), *Radio Monthly* will become the official organ of the Wireless Institute of Australia.

"The previous official organ, *Television and Radio Review,* is ceasing publication forthwith and very satisfactory arrangements were made with *Radio Monthly* to carry on on the same basis as *T & R Review.*

"Television information will also be published in *Radio Monthly.*

"Subscribers to *T & R Review* will receive their regular monthly copy of *Radio Monthly.*

(Signed) O F Mingay
Managing Editor
Television & Radio Review 9/2/32

And what must Leo Feenaghty have thought of all this? After nurturing QTC for four years, graciously giving it up for the good of the amateur fraternity, then seeing the whole lot sink within three months!

In January '33, Mingay started a new magazine called (would you believe *The Radio Review of Australia,* the contents and style of which set the pattern for the later Proceedings of the IRE. Mingay went on to publish a number of other wireless and electrical related journals.

Radio Monthly, the magazine that had suddenly become the WIA official journal, began in Sydney in December 1931, with A W Watt 2WW (of *Wireless Weekly* fame) as its managing editor, and Don Knock as the technical editor. At a price of 1/-, it comprised 68 pages of technical articles for domestic wireless builders and amateur builders, and included columns for the Association of Radio Amateurs of NSW and the WIA. It was a substantial production with glossy paper, of about A4 page size.

It was initially published by Federal Publications, Sydney, which later changed its name to *Federal Journals.* The magazine was the typical mixture of technical articles for builders and listeners, with amateur columns provided by various correspondents.

As outlined above, from February 1932 *Radio Monthly* became the official organ of the Wireless Institute of Australia, following the demise of *Television and Radio Review.* In mid-1932, Don Knock resigned as Technical Editor to join a rival magazine, *Australian Radio News* and Mr A Alexander, a professional radio engineer, became the Technical Editor in September 1932. *(to be continued)*

The Blackwood Radio Club

Early history of the first radio club to be established in South Australia

BY LLOYD BUTLER VK5BR
(ON BEHALF OF THE ADELAIDE HILLS AMATEUR RADIO SOCIETY)

Introduction

THE PERIOD AROUND 1920 to 1930 was an exciting time in the development of wireless communications and radio broadcasting and many keen people were attracted to experimentation with wireless or radio equipment. During this period, numerous radio clubs were formed in the Adelaide metropolitan area and in the country areas of South Australia. It is believed that some 20 or more clubs were formed. The Blackwood Radio Club had the honour of being the first of these clubs to be formed early in 1923. The club remained active to around 1937.

This article outline some of the history of the Blackwood Radio Club. This history has been assembled from various sources such as the club station logbooks, and the good memory of a remaining foundation member, Gordon Ragless. In 1983, a club was re-formed with its base at Blackwood, and in the final paragraphs we will also discuss that club.

Formation

The Blackwood Radio Club was formed by Owen Griffiths, Gordon Ragless VK5GR and Robert Ragless, with its headquarters at the Griffiths home at Young Street, Blackwood. The club affiliated with the WIA in November 1924

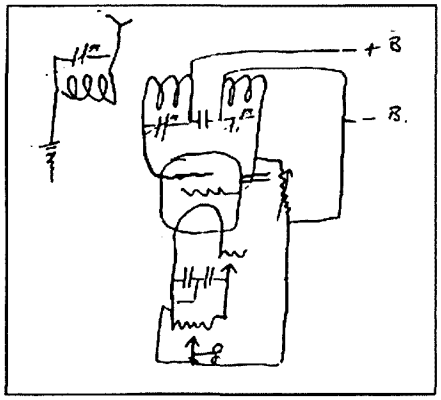


Figure 1 First short wave transmitter – as recorded in the VK5BR log by Don Elliott VK5RD (reproduced exactly as drawn)

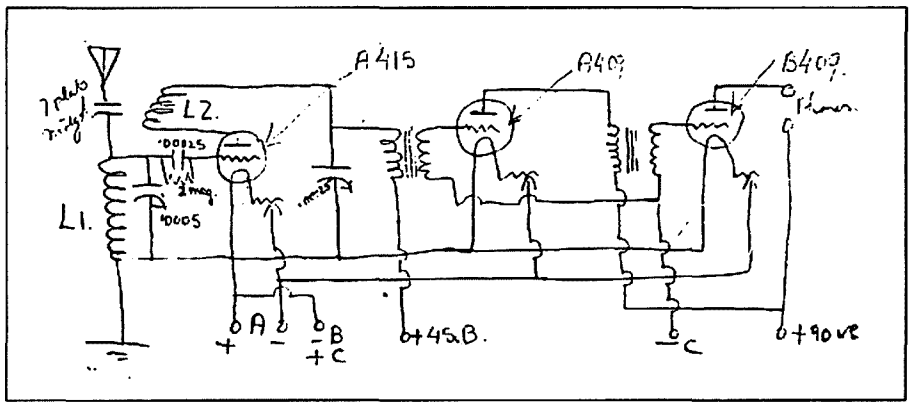


Figure 2 The Schnell receiver circuit used by VK5BR as recorded in the Blackwood Radio Club files. (reproduced exactly as drawn)

and, during the period of its existence, a number of its executive members served on the SA Division council of the WIA. (In fact, member Don Elliott served as a Divisional President).

Owen Griffith was the first secretary of the club and we was succeeded by Jack Ferry and then Ford Wells. Presidents included L H Griffiths (Owen's father) and Bert Lampe. Some of the other members were Robert Ragless, Don Elliott VK5RD, Arthur Baust, Harry Wheeler VK5HW, Lionel Badenoch VK5LB, Keith Mutton VK5ZY, Jack Hume, Erne Hume, Percy Deer VK5DR and Ivan Banyer (who had the very early callsign of XVQ, dated back to around 1913). Other names will appear as the article progresses.

The club was granted a transmitting licence and first went to air in August 1926. Transmissions were on the 200m band and the original callsign was A5BR. The callsign became OA5BR in 1927 and VK5BR in 1929. The significance of those early callsign prefixes is that "A" stood for Asia, and "OA" for Oceania Australia.

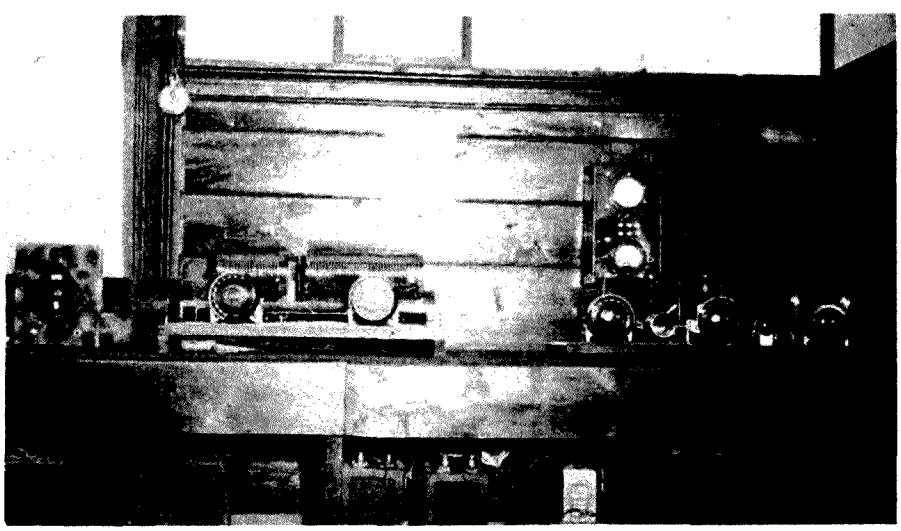


Figure 3 Early transmitting equipment – thought to be VK5BR when operating from Claphamaround 1931

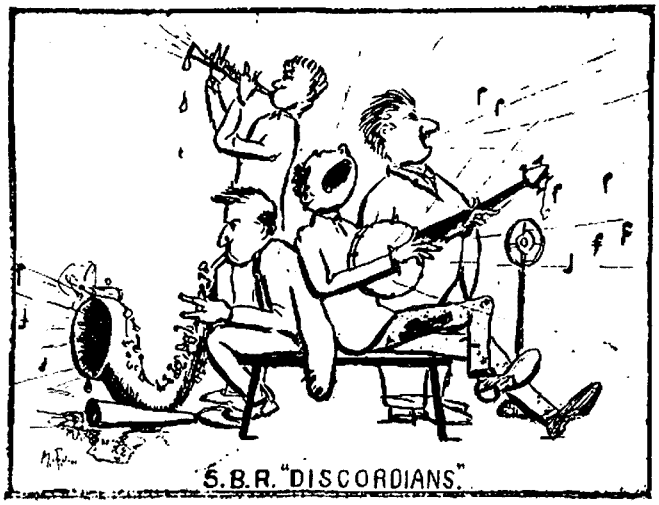


Figure 4 A sketch of the Blackwood Radio Club Orchestra prepared by Max Ragless around 1927. Standing is Bob Ragless playing the clarinet. Sitting is Jack Ferry playing the saxophone and Oswald Ragless the banjo. Frank Hill is shown announcing or perhaps singing. In later years, Max Ragless became a well known artist.

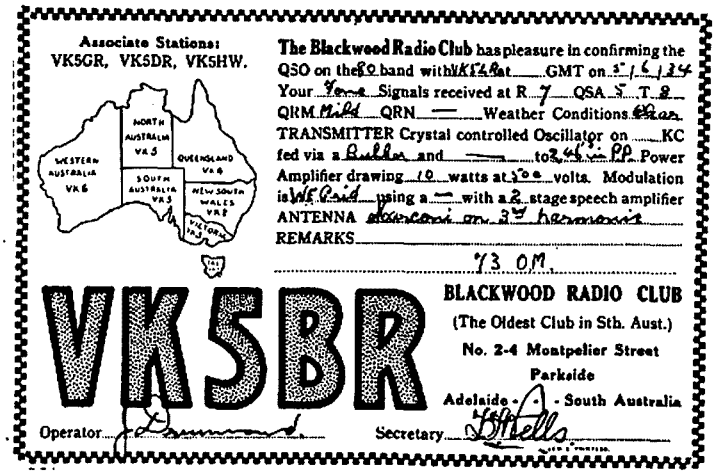


Figure 5 QSL card from VK5BR in 1934 when operating from Parkside. The operator is Jim Drummond.

The VK eventually became the internationally agreed prefix for Australia. Station VK5BR operated on the 200m band until October 1932 using the station for both communication with other experimental stations and for experimental broadcasting. The logbooks show that wavelengths between 170 and 200 metres were used. The experimental transmissions were restricted to times when the A and B class stations were closed down, essentially on Sunday mornings and after 10pm in the evening.

Transmissions first commenced from the Young St headquarters with a transmitter that used a split series Hartley oscillator with Telefunken system of modulation. Input power to the transmitter was only 3W, but good reports were received as far afield as Moonta and Kadina. Recorded music was played from a phonograph acoustically coupled into the microphone. Some years later this was replaced by a Bosch electromagnetic pickup.

The transmitter was soon upgraded to a Colpitts master oscillator using a UX201A valve driving a UX210 valve as an amplifier. This was Heising modulated with a Philips A630 valve (later changed to a B605 valve). Input power to the amplifier was 8W.

Construction of the original club station transmitter and receiver was essentially carried out by Owen Griffiths. Later construction was carried out by Jack Ferry.

A shortwave transmitter was first made up in 1928 by Don Elliott VK5RD. This used a split series Hartley circuit with 250V on a UX210 valve running 40mA to provide 10W of input power. A rough sketch of the circuit was made by Don in the VK5BR log and a copy of this is shown in figure 1. The shortwave receiver was constructed from the popular Schnell circuit consisting of a regenerative detector and two stages of audio. The circuit diagram for this was found in a section of the Blackwood Radio Club correspondence and the diagram is reproduced in figure 2.The antenna used with the original shortwave equipment was Zepp fed.

Figure 3 is a photograph of what is thought to be the VK5BR transmitting equipment at Clapham around 1931. On the left, with the large coils, is the 200m MOPA transmitter. The right-hand unit appears to be the HF transmitter.

Operations

The first shortwave contacts were made by Don Elliott in January 1928 on 32m and using the CW mode. Communication was set up for every Friday evening between 7pm and 11pm. Contacts were made with interstate and overseas stations.

Between October 1932 and January 1934 there appears to have been a break in the operations of VK5BR. Transmissions recommenced in January 1934 on the 80m band using the precise frequency of 3.593kHz. This continued until April 1935.

At some stage, the club must have further upgraded its transmitter to around 30W input. The log records figures of 600V at 50mA as early as April 1930. The precise frequency of 3.593kHz also indicates that they had probably changed to crystal control.

The club station shifted its location a number of times. It was first located at Young St, Blackwood, and then at Waite St, Blackwood, both the Griffiths residences. Around 1930, it was relocated to the home of Jack Ferry in Clapham and, around 1934, to the home of the Hume family at Parkside. This was also the original location of Broadcast Station 5DN, established by the Hume family. After 1935, the equipment was not operated, and some of it was stored at the home of Gordon Ragless. What fate it ultimately met is not clear.

During the period 1926-1929, frequent operators of the club station were Owen Griffiths, Gordon Ragless, Ford Wells, Robert Ragless and Don Elliott. Frequent announcers when the station broadcast were Owen Griffiths, Jack Ferry, Harry Wheeler, Oswald Ragless, Frank Hill, Robert Ragless, Ford Wells, Douglas Wright, John Messer, Milton Trott, Sid Maag, S Macey and H Naughton. The club also introduced its own studio orchestra. A humorous sketch of this orchestra in performance was prepared by Max Ragless around 1927. The original sketch is kept by Gordon Ragless and a copy of this is shown in figure 4. Here is shown Bob Ragless, Oswald Ragless and Jack Ferry playing the instruments, with Frank Hill announcing.

During the early years, contacts were made with many other stations, but not all of these were licensed. Many came under the category of what was known as an IWW, which stood for "Illicit Wireless Worker" or, in the words of Gordon Ragless, "I Wonder Who". They are more commonly known today as pirates.

In the period 1930-1932, station operators were Jack Ferry, Ford Wells,

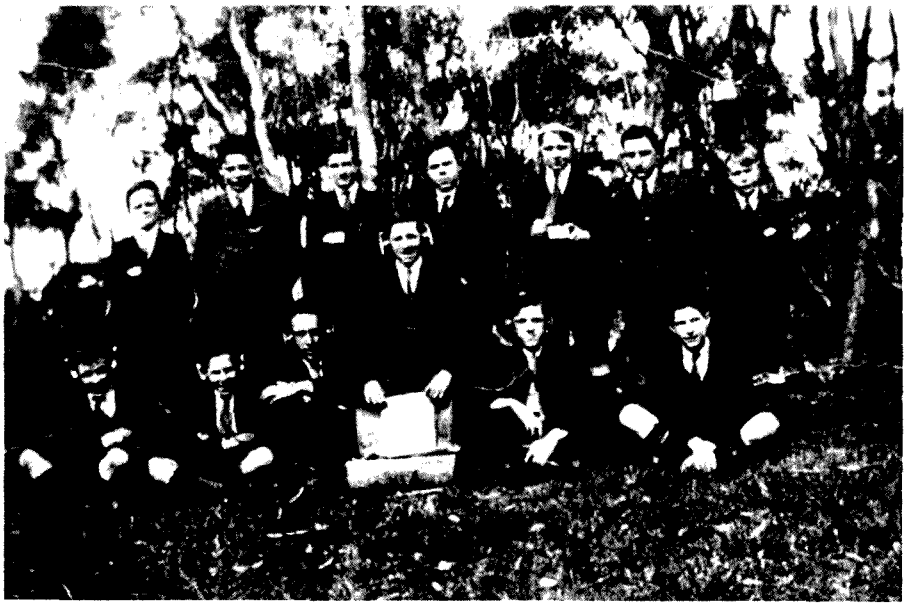


Figure 6 Combined field day of Blackwood Radio Club, Northern Districts Radio Club & Eastern Districts Radio Club held one Saturday near Eden Hills Railway Station. Top row from left – John Gill (BRC), Alec Robertson, Keith Mutton VK5ZY (BRC), a NDRC member, Doug Merry (NDRC), a NDRC member. Bottom row from left – Bob Ragless (BRC), Keith Litchfield (EDRC), Owen Griffiths (BRC), Bill Harmer (EDRC), Dick Whitington (NDRC), Clive George (EDRC).

Lionel Badenoch, Frank Hill, Jim Drummond, Ron Wauchope, Erne Hume and Milton Trott. From 1934 at the Parkside location, operators were Ford Wells, Frank Hill, Erne Hume, Jack Hume and Jim Drummond. Figure 5 shows a QSL card from VK5BR for a contact in this period on 80m. This demonstrates that, at that time, the RF power amplifier was push/pull 46 tubes with 500V on their plates running an input power of 10W. Grid modulation was used and the antenna is some form of Marconi.

It is interesting to observe how so many amateur radio experimenters turned to radio as a career and often the reverse. Some of the operators of the club station sought a career in radio broadcasting. Erne Hume was chief engineer at station 5DN from 1925 to 1941. He designed much of the transmitting and studio equipment used at that station, and designed the original transmitter at 5RM Renmark. Jack Hume was an announcer at 5DN for some years and was involved in other broadcasting activities such as writing plays. Frank Hill and Ford Wells became members of the technical staff at 5DN and 5RM.

Other Activities

For about four years around 1931 to 1935, the club published an official organ called "KEY-KLDX", and this was edited by Ford Wells. A typical issue for February 1932 included an editorial, a technical article on television by Harry Wheeler VK5HW, shortwave notes by Gordon Ragless VK5GR and other features.

As with our clubs of today, the Blackwood Radio Club arranged for interesting technical lectures at its meetings and arranged for visits to such places as Radio Station 5DN, the Unley Telephone Exchange, the Adelaide Observatory and the Hackney Tram Depot. It also organised social events such as the Blackwood Radio Club picnic and other field days. One of the field days included a visit to Kangaroo Island via the old *SS 'Karatta'* to visit a radio amateur on the island. According to Milton Trott, this turned out to be rather a rough voyage. Another activity was the provision of radio for the Adelaide rowing event, Henley on Torrens.

Keith Mutton VK5ZY was able to supply a group photograph taken by Gordon Ragless at an early field day around 1923. (Refer figure 6). A copy, probably supplied by Gordon, was also found in the Mitcham Library archives. The field day was a combined event of the Blackwood Radio Club, the Northern Districts Radio Club and the Eastern Districts Radio Club. In the centre of the photograph is a transmitter which used a single early Mullard ORA valve. (ORA stood for Oscillator Rectifier Amplifier). Individuals in the group, with headphones fitted, had simple receivers which were used to detect signals from the transmitter. The object of the field day exercise was to see how far away they could go and still pick up the signals.

For many years, the Blackwood Radio Club ran a monthly dance which was held at the Eden Hills Parish Hall. It also held an annual radio concert at the Boys Club Hall in Blackwood. From all accounts, the Blackwood Radio Club became quite a social organisation, with social and not just technical type of membership.

The club ceased to be active around 1937, a little before the start of World War II. The club was not reactivated

Figure 7 Gordon Ragless operating his station VK5GR around 1933.

after the war and its callsign VK5BR was allowed to lapse. The callsign was re-allocated to Lloyd Butler in January 1946 and still remains in his hands.

VK5GR

We have been fortunate to have club foundation member Gordon Ragless still with us to verify some of the facts presented in the article. Gordon operated his own station VK5GR and a photo of Gordon and his early amateur radio equipment is shown (refer figure 7). A further recent photograph (figure 8) shows Gordon with his early transmitter and the original VK5BR microphone. Gordon's transmitter is now an exhibit at the Adelaide Telecommunications Museum. The VK5BR microphone case is held by the Adelaide Hills Amateur Radio Society.

With 67 years elapsed since the Blackwood Radio Club was formed, and 54 years since it ceased to function, it is not surprising that there are now few of its members to be found. However, in addition to Gordon, we were able to contact Keith Mutton VK5ZY, Jim Drummond and Milton Trott, who were also members in the very early years of the club, and who were able to add a few details for this article.

A New club

In recent years, radio clubs have again become popular and numerous clubs have been formed much as they were in the 1920-1930 era. In 1983, some 46 years since the early Blackwood club had dissolved, a new club was formed with its base at Blackwood. On 10 February 1983 the Adelaide Hills Amateur Radio Society was formed in the Blackwood War Memorial Hall. Marshall Emm VK5FN was elected president and, at a following meeting on 17 March, David Green was elected secretary and Alf May was elected treasurer.

The society was accepted for affiliation with the WIA on 26 July 1983. An amateur station licence was taken out with the callsign VK5BAR (since the old VK5BR call had been re-allocated). The society started with a membership of 14. At the time of writing, this had increased to a figure of 65.

The society has regular monthly meetings at which there is usually a technical lecture or guest speaker. Visits have been arranged to such places as the National TV transmitter site at Mt Lofty and the Telecom Cellular Radio Base. A popular event with South Australian amateurs is the annual November buy-and-sell day which is organised by the society.

Amateur radio station equipment is owned by the society and it involves its members in radio field days and public radio exhibitions. It is also responsible for hosting the yearly national CW sprint.

Figure 8 A recent photograph of Gordon Ragless with his own early transmitter and the old VK5BR microphone.

Essentially, due to the initial efforts of member Marshall Emm, the society has set up facilities to examine amateur operator certificate candidates in devolvement of this function by the DoTC. In fact, the society was the first to conduct examinations in Australia. These first took place on 25 November 1989 and have since been repeated at regular intervals.

Various enthusiastic members have held office in the society since its inception. At the time of writing, the president was Alan Haines VK5ZD, the secretary was Meg Box VK5AOV and the treasurer was Bryan Trott VK5PBT. Others who have held office include Marshall Emm VK5FN, Bob Burton VK5ZAL, Hans Smit VK5YX, Doug Head VK5DUG, Gordon Welsh VK5KGS and Jenny Warrington VK5AMW.

Writer's footnote:

It is pure coincidence that I was issued with the callsign VK5BR in 1946, and at that time I had no idea that the callsign had such an historic background. However, this gave me an incentive to find out more about its early history. What you have read now records in print the information, such as in the memory of Gordon Ragless, before it is lost.

Lloyd Butler VK5BR **ar**

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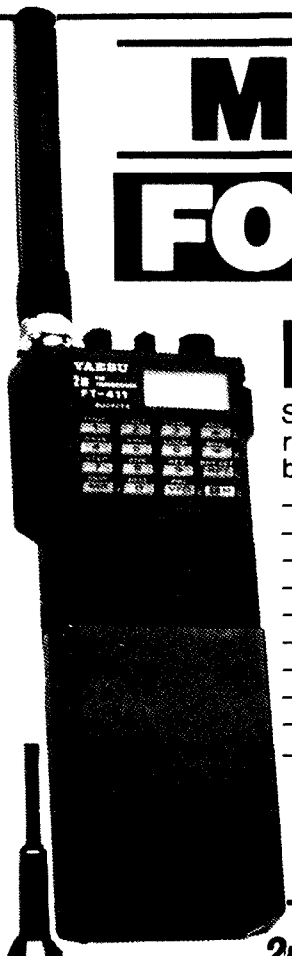

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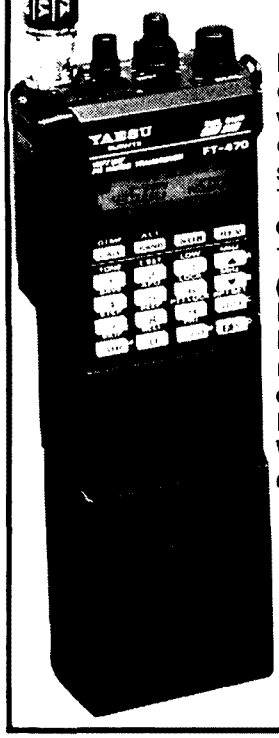

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See A.R.A review Vol 12, Issue 5, or A.R. review Aug '89 issue.

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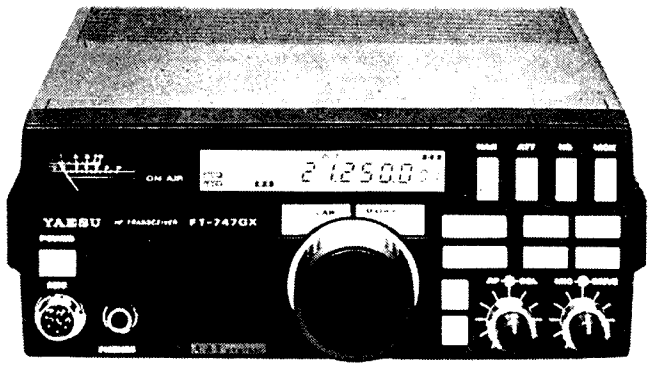

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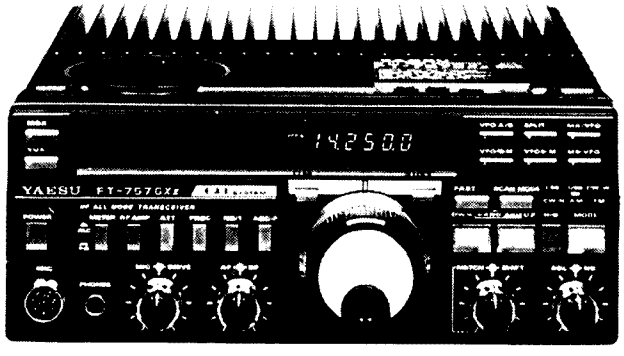

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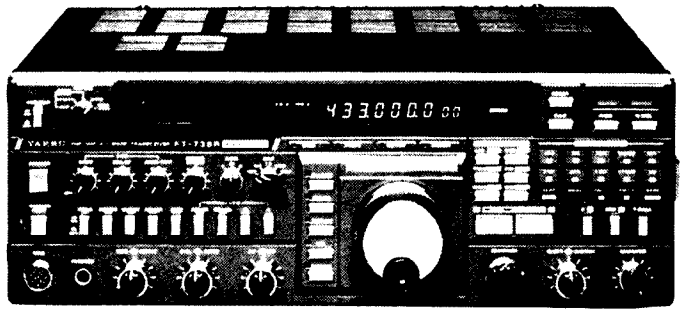

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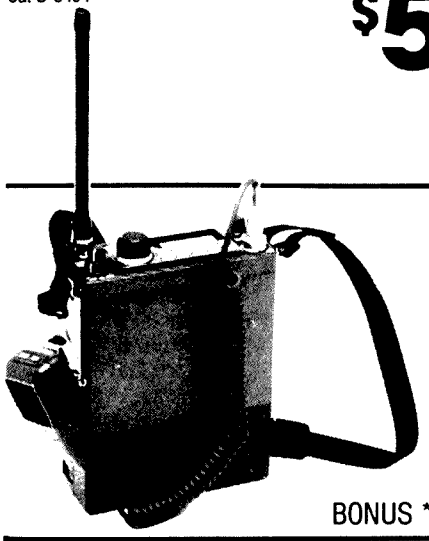

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Selamat Datang

(AND THEY MEAN IT)
KEN PINCOTT VK3AFJ
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(Written from a delegate's viewpoint, this account complements that by 9V1RH. Ed)

ON A PREVIOUS OCCASION (*AR* September 1990) I wrote about SEAnet 1989. I said at the time that whoever organised the next convention would have a very difficult act to follow. Nothing daunted, Malaysian Amateur Radio Transmitting Society (MARTS) undertook to hold the 18th Seanet Convention, possibly in Malacca. As it turned out, the venue was changed to Kuching, and its member club, Sarawak Amateur Radio League (SARL) became the host. At the last count, SARL had 24 licensees, of which 17 are in Kuching, and 10 members without licences (but high hopes). Due to their enthusiasm and drive they outdid last year's efforts, something I thought impossible. Let me now tell you something about SEAnet for 1990.

After 11 hours travelling, our little party comprising Alf VK3LC and XYL, plus myself and XYL, landed at Kuching airport a few minutes before midnight local time. A friendly greeting, bang, bang, bang with a rubber stamp and a "have a pleasant stay" from the immigration officer saw us officially in Malaysia. On leaving the building we were confronted by a huge banner which read:

1990 SEANET DELEGATES
WELCOME TO SARAWAK
LAND OF THE HORNBILLS

under which was what I thought would have to be the happiest looking face on earth, but I found after a few hours that such faces were pretty much the norm in that part of the world.

The face which greeted us was that of Festus 9M8FH who whisked us off to our hotel and made sure we were comfortably installed. As far as I could gather he kept meeting planes for the next 36 hours, with hardly a break.

We had arranged our trip to arrive two days before and to depart three days after the convention, giving us a change to see something of the area. I'll come back to this later.

The organising committee worked like beavers all Thursday and Friday on the registrations, preparation of name tags and putting together folders of information regarding the program for the weekend, and what could be seen and done after the Convention.

These folders, along with an attractive ceramic memento of the occasion and a most informative 1990 diary, were left in our room some time Friday when we were out exploring the city.

Proceedings began with a dinner on Friday night hosted by the Mayor of the City of Kuching South. The convention was opened officially by the Chief Minister of Sarawak on Saturday morning, followed by lunch which was hosted by the State Government of Sarawak. Saturday afternoon was devoted to the symposium, when we heard from the Director-General of Telecommunications Malaysia, a representative of the President of JARL, who was unable to attend personally, Mr D Devan, Director of IARU Region III, Mr Geoff Robinson of IPS Radio and Space Services Australia, who gave a demonstration of IPS Advanced Stand Alone Prediction System, and David Rankin, chairman of IARU Region III. Dinner on Saturday night was hosted by the Ministry of Environment and Tourism Sarawak. The night was topped off with a durian party by the pool.

Sunday's daylight hours were devoted to sightseeing, taking in a tour of the city, a river cruise (lunch served on board) and a visit to the cultural village located about 30km from Kuching.

The final official event was more feasting on Sunday night, this time hosted by the Director General, Tourist Development Corporation of Malaysia. This event, and the festivities associated therewith, lasted until midnight.

It would be impossible for me to list all the speakers at the various functions, but I must mention Mr Richard L Baldwin, President IARU, who managed to celebrate the 25th (approximately) anniversary of his 39th birthday during the weekend.

All told, 258 people representing 18 countries attended the convention. Apart from the countries in the South East Asia area, other countries represented were Italy, Germany, England, Canada, USA, India and Sri Lanka.

An amateur station with the special callsign 9M8SEA was set up on the 10th floor of the Holiday Inn. This created much interest for the VIPs.

Apart from those already mentioned as helping with the convention, many business organisations helped with advertising in the diaries, and Malaysia Airlines sponsored SARL's paperwork.

To sum up the Convention I can do no better than quote verbatim from Dick Baldwin's final address:

"I get a chance to travel all over the world, meet hams all over the world, meet telecommunications administrators all over the world, attend hamfests and Conventions all over the world; I have never been to one that was better organised than this (loud applause). It has been a great weekend."

A large proportion of the weekend was video taped, and for a very modest sum I obtained edited copies of the three tapes — a unique memento of the Convention.

On the Monday after the Convention, at some unreasonable hour of the morning, some of the younger and physically fit delegates (that lets me out) left on the DXpedition to Mulu Caves where they operated as 9M8ULU. They had not returned by the time we left Kuching, but we were told they had managed to make a number f contacts.

The SARL club station 9M8MKS is permanently located on the 11th floor of the Holiday Inn, with the antenna systems on the roof. Now that is what I call organisation. I had a look through their log book, and from 19/2/90 to 12/11/90 they had made 1870 contacts, only one of which was with a VK. Alf and I improved on this a little by working two VK5s on 10m. Although we were hearing VKs on 15m, we could not raise anybody.

We still had a few days to fill in and managed a day trip to Bako National Park — a full day trip involving travel by car and longboat. Unfortunately, we could not cover the whole park as the going was too rugged for us senior citizens. I would suggest to anybody contemplating a trip to Sarawak, that you contact the Treasurer of SARL — Jimmy Choo Poh Hin — who is probably in the best position to suggest trips etc to match your age and physical condition.

Having our XYLs with us meant — of course — a shopping expedition. Shopping in Kuching bears no resemblance to

shopping in Singapore. Their newest (five years old) and largest shopping complex has about 50 shops spread over four floors. In the main their shops consist of the so-called shop houses. Life moves at a leisurely pace, nobody pesters you to make a purchase, and prices are very reasonable. If you stop to look at a shop the proprietor will most likely come out and invite you in.

Walk in on your own to browse and receive a friendly "selamat datang" (welcome). Decide to make a purchase and the proprietor and his family all come along to assist you. I especially recall my XYL deciding to buy a couple of silk scarves. Making her requirements known, almost instantaneously four people were producing scarves of all colours, patterns and sizes, chatting and laughing all through the transaction.

No ham gear is available in Sarawak.

Strangers would stop us in the street to greet us, ask where we came from, how long we were staying, did we need any assistance. On being assured we had everything under control, we would exchange a few pleasantries and they would wish us a happy visit and be off.

Visit Malaysia Year and Selamat Datang were really working.

On reflection, if I had to nominate the happiest person I met, I would have to name Francis, the immaculately dressed restaurant manager at the hotel. He could make a delightful meal into a most pleasurable experience just by greeting us with his infectious smile and stopping to talk with us as he moved round the restaurant. He and his staff treated our smallest request as if it were a Royal command. In discussion with him we learned that he worked from 7am until 9pm six days a week. For this work he received 15 ringgit (less than $7.50) and one meal a day. The hotel supplied his suit.

We seemed to spend an enormous amount of time eating, and, as I said last year, it seems to be a national pastime. If ever eating is made an event at the Olympic Games, Singapore may take the gold, but the silver and bronze will go to Malaysia.

After a most pleasant week we departed for a few days in Singapore, where, armed with a list of establishments where one might purchase amateur gear, Alf and I set out on an expedition. Much to our surprise, there was very little available, and what was there was about the same price as we would pay here; more if one had to pay duty and sales tax on arrival home. We made no purchases. It looks as though today's economic climate is fast catching up with Singapore. The only bargains appear to be some items of video equipment, of which there appears to be a vast amount available.

SEAnet 1991 — well, it is scheduled for Thailand, but not in Bangkok. The most likely venue is Chiang Mai, and unfortunately there is virtually no chance that we will be attending as we have other commitments for 1991. Hopefully somebody will attend to represent Australia.

ar

Fast CW Reminiscences

JACK WHITTAKER VK4CGO
11 CARNEGIE ST
WESTLAKE 4074

MUCH HAS BEEN WRITTEN recently about changing times, the changes in amateur radio procedures and attitudes and the value in home brewing, the Morse code etc, etc.

I believe that we are now witnessing a changing pattern in the CW part of the bands — as my observation seems to indicate the apparent disappearance of the fast CW ragchewers.

I remember spending many hours in earlier years listening to operators such as George Studd ZL2AFZ — who was without any doubt the fastest CW operator in this part of the world, even though he was, I think, a great-grandfather and getting well on in years, his CW prowess was still quite amazing — 20m QSOs with (as I recall) W9ELG were a source of very high-speed code listening on that band — something which seems noticeably missing from the airwaves today.

Sadly many detractors and knockers of CW I think simply cannot appreciate just what that fast code was about, and nowadays the younger operators do not progress to those levels — I suppose the backgrounds and the interest and incentives do not any longer exist. Perhaps it is akin to lamenting the passing of the steam train, but a backward glance could be worthwhile, if only to realise what has all but slipped away already.

Fast code at the speed level I am referring to was really something, which, apart from sheer practice and achievement, was a situation where the operator actually thought words and word groups — in fact just THOUGHT what was to be said as in normal everyday speech. Morse was sent and received on THAT level. All the intermediate brain processing and finger co-ordination were at a subconscious and automatic level, and whilst I concede that not everyone may be capable of such skill levels, it does make CW at such levels intriguing, to say the least.

I had the pleasure of meeting George Studd in the late '70s and had quite a chat with him.

George was, I believe, in his earlier years an operator with the Post and Telegraph section of the Post Office and had worked through from hand keys to bugs to electronic keyers — ending with the iambic keyer, which, with squeeze technique for letters C, F, L, Q etc, contributed to smooth speed keying. He did NOT use a keyboard keyer — though possibly W9ELG did, I do not know about his method of operation. George told me that he had not worked with his hands with anything heavier than a pen or pencil, which no doubt assisted him to retain such nimble and responsive fingers. He told me that he had taped a sending session of 10 or 20 minutes, timed it accurately at 62 words per minute, and, upon slowing the tape for replay and careful scrutiny, found one character error and one slur.

Ham radio QSOs — ragchews on CW (without keyboard computers) at high speeds — upper 40s — into the 50s and above DID exist, and were ENJOYED by the participants, but as the years have progressed, most of those who developed highly advanced operating skills have either been slowed by the aging process, retired from these aspects of the hobby, or died of old age.

Though the passing of such advanced skills has undoubtedly occurred, and further lessening of CW values is inevitable, the past high levels of achievement still should be historically recognised — even if what remains in 1991 seems like pure nostalgia.

ar

An Overview of EMI/EMC in Australia

MR N JOSEPH
COMMITTEE EXECUTIVE OFFICER, TE/3
STANDARDS AUSTRALIA
(REPRINTED BY PERMISSION FROM STANDARDS AUSTRALIA)

Australian Standards

AUSTRALIA HAS RECENTLY published a series of electromagnetic interference (EMI) Standards, based on the International IEC/CISPR Standards, in order to set limits of tolerable interference to other equipment, and to assist Australian manufacturers export their products.

Standards now exist covering emission of interference from information technology equipment (ITE), ie computers and like equipment, industrial scientific and medical (ISM) equipment, overhead powerlines and radio and television receivers etc.

All electrical and electronic equipment produces electromagnetic interference, either conducted along the supply cord or radiated directly from the equipment.

Similarly, most equipment is susceptible to interference either conducted into it, usually via the mains supply lead; from nearby radiated electrostatic or electromagnetic fields or from electrostatic discharge from nearby objects.

For equipment to be safe and operated satisfactorily, it must be compatible with other equipment, that is, emit interference below a given level and operate in an environment of up to a given level of interference.

With the proliferation of electronic microprocessor appliance controls and, computerised office and factory equipment, compatibility has become of real concern.

Although Australia has its own EMI Standards which specify acceptable limits, these limits were voluntary until 1985 when a mandatory Standard specifying the limits of interference from industrial, scientific and medical (ISM) equipment became necessary to protect safety-of-life communications, aircraft navigation, from industrial high-powered radio-frequency (RF) heaters.

Because of the spread of computer equipment into telecommunications equipment it has also become necessary to protect the telecommunication network, so that from January 1991 all equipment directly connected to the telecommunication network must meet Australian AS3548 — Electromagnetic interference from information technology equipment (ITE).

Australia has copied the IEC/CISPR Standards except where variations were absolutely necessary, such as in Australia where there are several aircraft navigation beacon frequencies which are not used elsewhere, and these frequencies must be protected (safety-of-life) from high-powered industrial equipment.

Australia has adopted the international EMI Standards prepared and published by CISPR, a group of committees which is part of the International Electrotechnical Commission (IEC) Standards preparation organisation.

International Standards

IEC Standards have been accepted by all the European Commission (EC) and European Free Trade Organisation (EFCO) countries plus Japan, New Zealand and Australia, and although the USA FCC Standards vary, they are somewhat aligned.

The European Commission, by its EMC Directive 89/336/EEC of May 1989, has made EMI/EMC Standards for *all* electrical equipment mandatory from December 1922, the member states having to implement legislation by July 1991 for enforcement by January 1992.

The European Commission compliance is based on self-certification where a manufacturer submits a certificate declaring their equipment meets the appropriate European Standard (EN), which is technically the same as the IEC Standard. Testing does not have to be carried out by an independent third party. The exception to this ruling is for equipment connected to a telecommunication network where mandatory third party testing is required.

New Zealand has made EMI Standards mandatory except for motor ignition noise, the compliance and testing authority being the New Zealand Post office, but they do accept test reports from approved laboratories.

Japan has voluntary (virtually mandatory) Standards based on IEC Standards for most equipment under the control of VCCI accepting reports from approved laboratories.

EMI/EMC
Comparison Australian, European and USA Standards

AS	EN	CISPR	BS	FCC[4] CFR47 Coda of Federal Regulations	Short Title	Comments ≡ identical ≠ not identical
1044	55 014[1]	14	800		EMI Appliances	AS=CISPR, =EN, BS
3548	55 022[1]	22	6527[1]	Part 15	EMI Appliances ITE	AS=CISPR, =EN, BS
1052		16	727		Measurements	AS=CISPR, =EN, BS
2257		12	833[3]		Ignition	AS=CISPR
2344		18.2[2]	5049[2]	ANSI 430[5]	Overhead lines	No limits in BS or CISPR
1053		13	905	Part 15	Radio & TV	AS≠CISPR
2064		11		Part 18	ISM	AS≠CISPR
2839		IEC 107	3549[2]		EMC Radio/TV	AS≠CISPR, BS
XXXX	55 020	20			Immunity Radio/TV	AS=CISPR, ≠EN
3145		17[2]	6299[2]		Suppression devices	AS=CISPR, BS
—	60.555.1	IEC 555.1	5406.1		Harmonics-definitions	EN=BS, IEC
2279.1	60 555.2[1]	IEC 555.2	5406.2[1]		Harmonics-household	AS=IEC, ≠EN, BS
2279.2	—	—	—		Harmonics-Industrial	
2279.3	60 556.3[1]	IEC 555.3	5406.3[1]		Volt fluctuation-household	AS=IEC, EN, BS
2279.4	—	—	—		Volt fluctuation-Industrial	
NIL	55 015	15	5394		EMI fluoro	BS=EN, ≠CISPR
				Part 68	Telecom connected	

Notes: 1 EN=BS
2 CISPR=BS
3 =NZS 6621
4 FCC differ from all others, ie in limits and in bands
5 ≠EN, CISPR, BS

(We are also holding a copy of "Tha International Electromagnetic Compatibility (EMC) Standard for Information Technology Equipment (ITE) — Future Revisions of IEC/CISPR publication 22 (AS3548)" by I McFarlane, Head, Electromagnetic Compatibility Group, Research Laboratories, Telecom Australia — Ed)

continued on page 34

Build an Insulation Tester

BY MERVYN EUNSON VK4SO
GPO BOX 1513 BRISBANE4001

AN INSULATION TESTER IS NOT the sort of thing electronics stores stock, and our amateur fraternity seems to have overlooked the uses of this instrument.

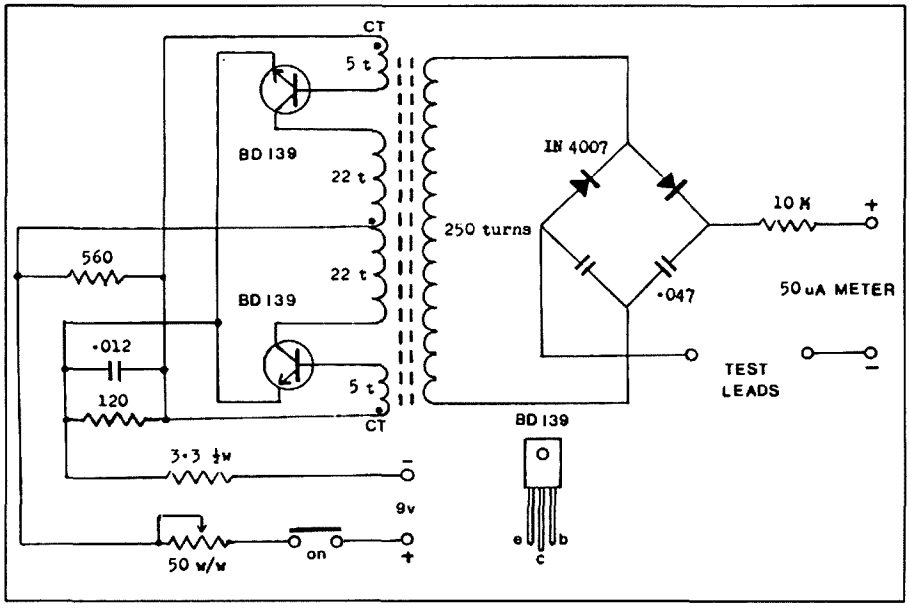
It's handy for testing isolation of salvaged transformers selected for rewinding, possibly charred by overload to the point of breakdown. It has many uses in checking antenna transmission lines and all manner of wiring or cables. Indeed, it will measure anything in the high megohm range — for example, have you ever tried to measure a 10M resistor on a multimeter?

The concept seemed simple enough, only a high-impedance ohm-meter with a range in the hundreds and thousands of megohms. A high driving voltage is needed, of course, with low current for safety.

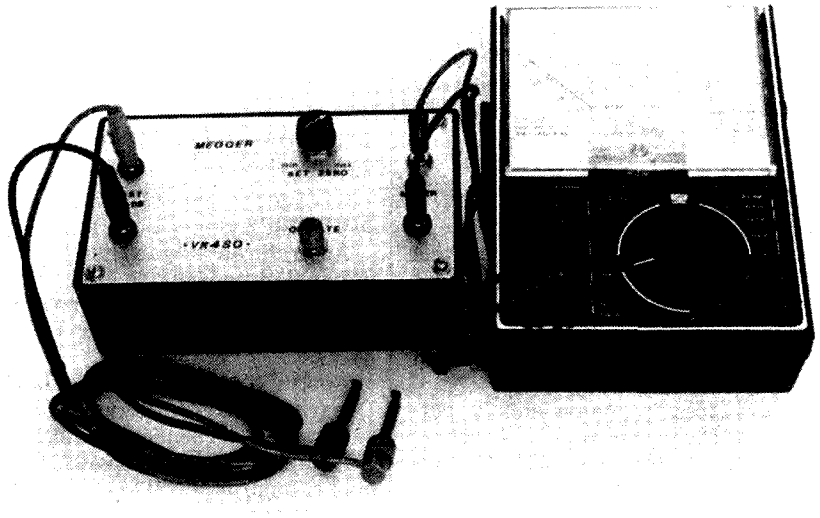
It took no time to knock up a working model. A search of the junk produced a telephone-ringing alternator delivering 48VAC, plus a small 12/12V mains transformer with primary taps of 230/250V. With a rectifier diode and meter a fair insulation tester resulted, leaving no incentive to improve on it. However, it was not quite state-of-the-art, for things just have to be solid-state these days.

So, back to the junk box for a pot core to wind a DC/DC inverter. No joy, and they're too dear to buy. Hmmm, but there's one of those funny ferrite formers from a TV timebase — it'll do. Now to salvage wire for a secondary winding. This proved to be a bobbin from old PMG gear, nicely labelled 500 turns 8mil (or 32g). Even better, the inside was the same diameter as that of the former, for a neat fit (Murphy's me mate, you know). This enabled a quick lash-up to test feasibility of the approach. Sure enough, better than 500V AC output was available.

Not being one to rely on supernatural help, a simpler secondary was home-brewed. An offcut of half-inch PVC con-



The Simple Circuit



The bench-top assembly

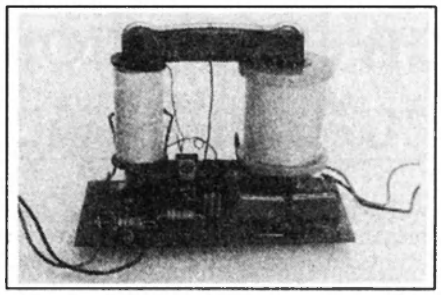
duit with two plastic cheeks added made a bobbin to fit on one leg of the square former. The salvaged 32g wire (equivalent to decimal size 0.2mm) neatly wound 100 turns per layer. A total 250 turns were wound in layers, each interleaved with waxed paper (lunch-wrap). The intention was to produce 250V AC and use a voltage-doubler rectifier to give 500V DC into a 50μA meter (if you plan on using a 100μA meter, a total 500 secondary turns will be required). Any gauge of wire will do, but finer wire than 32g breaks too easily, and thicker gauges prove too bulky.

The primary winding was fluked equally easily. A layer of tape was placed on the other leg of the former with fibre washers for cheeks. Two short pieces of 22g wire somewhat over a metre long were scrounged for starters, and the available space was simply filled with one layer of 22 bifilar turns. This proved to be another hole-in-one (thanks again, Murphy).

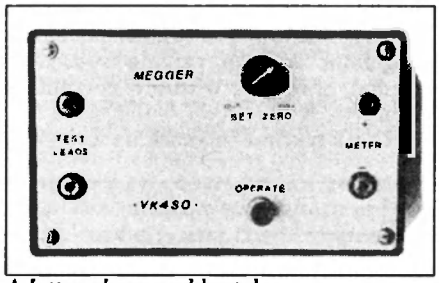
The feedback winding goes over the primary. A single centre-tap winding might suffice, but a balanced bifilar form is more efficient. Thus five bifilar turns of something like 26g are needed (thin hook-up cable is acceptable).

The base connections or ends of this feedback winding need to be phased correctly. A tedious explanation is avoided by suggesting that if the inverter fails to work the first time, merely reverse the feedback leads.

Two small BD-139 power transistors conduct alternately to deliver ample drive. No heat-sink is necessary, for total dissipation is but a fraction of their limit of eight watts. Base current is limited by a 560 ohm resistor and another of 120 ohms creates imbalance in the symmetrical circuit to cause oscillation to be self-starting. A surge-limiting resistor is included in the emitter supply, and the few components mount conveniently on



The simple assembly



A lettered case adds style

plated strip-line board.

The creature is not fussy about supply voltage, and will function happily with 6V applied. This allows a small inbuilt 9V battery to be used (current drawn is about 75mA and operation is brief and infrequent). A press-button switch in the supply lead energises the circuit. To obtain the precise output voltage of 500V for FSD a 50ohm wire-wound pot is added as a zero-set control.

Two 1000V diodes (IN4007) serve in a voltage doubler rectifier. With a high frequency of operation and negligible load only minimal values are needed in the discharge capacitors, so two .047μF polyesters (630V rating) are adequate. Now there is the required DC output of 500V

A one per cent series multiplier of 10M determines this same centre-scale reading on a 50μA movement. Such a meter would need to be calibrated and marked, of course, a simple matter using Ohm's Law, to produce the familiar logarithmic scale, cramped at the upper end.

At this stage a potential setback loomed — no suitable meter in the junk box! But, hold on, is there not one on the bench with a 50μA range on the trusty multimeter? So help me if it isn't already calibrated with a direct-reading ohms range showing (with mental conversion) exactly 10M at centre-scale and a top reading of 2000M (you beauty, Murphy!). Easy enough to couple it outboard to the Megger with banana plugs.

Operation is exactly as with a multimeter. First short the clips, used for connection to whatever is to be tested, and obtain FSD on the 50μA range with zero-set control. Now measure the unknown quantity, anything up to 2000M. Actually, in most cases you'd be gauging the extent of isolation, usually a degree of good or bad, and precise values seldom are needed.

The output voltage is safe to handle— an inadvertent encounter merely produces a slight tingle, barely perceptible with the high impedance. *(Still not a recommended practice. Ed).*

Besides testing doubtful transformers, the instrument proves excellent for checking twisted mic cords and suchlike. Suspect leaky coax also, even open antenna feeders (dust on the spreaders creates havoc). In one specialised instance it was invaluable in determining the quality of various insulating materials for constructing Tesla coils and high-voltage apparatus (possibly a forthcoming article).

The insulation tester or "Megger" is better known for its use by electricians, who perform mysterious rites on mains cables and earth wiring. However, such things are not within the province of amateurs, and this branch of fiddling is best left to those trained and licensed for the purpose.

Note "Megger" is a trade name. **ar**

An Overview of EMI/EMC in Australia *(continued from page 32)*

In the USA, electromagnetic interference is controlled by the Federal Communications Commission (FCC) under its Code of Federal Regulations CFR47, Part 15, Subpart J. They have six levels of authorisation:

Type approval — mandatory, safety-of-life equipment

Type acceptance — licensed transmitting equipment

Certification — non-licensed devices, ISM

Notification — manufacturer tests and keeps record of text

Verification — computers (except PC), TV and FM — manufacturer tests and keeps records

Registration — telecommunication connected equipment

Most approval is by desk review with appropriate test certificates. FCC bands and limits differ from the IEC, usually being a looser limit. There are no EMC limits in the USA.

EMC

Very few EMC Standards have been published giving the interference levels of the environment in which equipment must satisfactorily operate. In Australia there is AS2839 —

Colour Television Receivers and AS2279, Parts 1, 2, 3 and 4 —

Disturbances in mains supply networks, but because of the EC directive, considerable development of EMC Standards has been undertaken by IEC Committees. Several of these compatibility drafts are near to completion and will probably be published within 12 months. These IEC drafts will be copied by Australia as soon as they are published, thus giving Australian international EMC Standards.

Summary

Australia has aligned itself with International Standards so that testing to Australian Standards will meet the requirements of EN, IEC or FCC Standards.

Australia's EDI/EMC regulator, the Department of Transport and Communications, is at present examining the need for mandatory electromagnetic interference standards and, if found necessary, it will examine the economic effects before introduction. **ar**

Amplifier Reminiscences

PETER R SPENCER VK5KBK
PO BOX 147 CLARE 5453

HAVING READ AN ARTICLE on the Williamson Amplifier, of 1947 vintage, in the July issue of *Electronics Australia,* I have been prompted to write on some rather humorous experiences I remember around this period. Most of what follows concerns a character I knew who was an avid supporter of triode output stages in audio amplifiers, to the exclusion of all others.

This character, who I shall refer to as "Syd", was not blessed with an outstanding knowledge of the English language, but what he lacked, he more than made up for in stating his views with forcefulness and uncompromising attitude. He was a tireless experimenter and spent a great deal of time and money on his audio amplifiers. In order to convey the full impact of his statements, I will write Syd's version of what he wished to convey, followed by the accepted terminology.

I feel sure many readers who remember the days of valves will find this rather amusing.

Having read all about the virtues of the Williamson amplifier, I happened to meet Sydney shortly after reading the articles and, of course, asked him if he had seen them. Well, Syd informed me that on a visit to Adelaide, he had actually heard an example at a large radio store. When asked his opinion, the reply went something like this: "No good at all — full of 'screechy treble'; not enough bass."

Now we come to the first 'clanger' — "You can't beat TREEODS (triodes) with plenty of BYRUS (bias); them PENTHOIDS (pentodes) will never sound any good."

This rather 'rocked' me and I found it a bit difficult to keep a straight face. However, more was to come. It appeared that Syd had tried a new circuit using his beloved TREEODS and he was far from satisfied with the results. It was, of course, nothing to do with the valves or his circuit, but he was sure the output transformer was causing all the trouble. When I asked him for an explanation, he uttered his masterpiece — I quote — "The output tranny has HYSTERICS (hysteresis) in THE LAMINGTONS (laminations)."

There was no doubt that Syd had been doing some heavy reading on the design and performance of output transformers, but due to a somewhat sketchy education, his understanding of the technical wording was a little off the track.

What made these remarks even funnier was that his statements were always made in very rapid speech and an atmosphere of complete and uncompromising authority.

Following all this, which happened so many years ago, I very recently experienced a strange stroke of fate. My son, who lives in Port Lincoln, rang me to say that he had come across a hefty power supply which apparently, had been bought at an auction sale by a neighbour of his, and he wondered if it would be of any use to me as the neighbour had no use for it, but thought he might just "plug it into the mains — to see what would happen!!"

Eventually I came into possession of this supply and was amazed when I recognised it as the power supply from a huge PA system which Syd had bought from a firm which, I understand, built it for the Adelaide Showgrounds. The story was that for some reason the deal fell through and the system was sold when the firm went out of business.

It was just as well that the neighbour had decided against "seeing what would happen" as the largest power transformer was rated at 2000 volts at goodness knows how many milliamps. Apart from this, the whole of the wiring was done with rubber-covered hook-up wire, which had well and truly perished. I cannot remember what the valves were in this amplifier except that they were very large transmitter-type triodes — four in push-pull parallel for the output stage.

I guess Syd could not resist this huge unit — full of triodes!

Anyway, the transformers are still okay and one day will make a very big contribution to a linear amp. ar

Remember to leave a three second break between overs when using a repeater

AWARDS

PHILL HARDSTAFF VK3JFE – FEDERAL AWARDS MANAGER
PO BOX 300 SOUTHCAULFIELD VIC 3162

International Reply Coupons

Just before I went to the post office this week (7 Jan) to swap some IRCs for stamps, I happened to have a look in the back of the Postal Charges booklet (effective 3 September 1990 edition). I looked under IRCs and noticed this little paragraph tacked on the end which read, "Note: As from 1 January 1991 the coupon will be exchangeable for airmail postage for a standard article up to 20g." Hmmm, very interesting, I thought. How are they going to work this, as the rate for a standard article under 20g varies, depending on where it is going, between $0.85 and $1.50. Anyway, off I went to the Post Office, and asked the unsuspecting lady behind the counter what amount of stamps can I get for an IRC. Eighty-five cents was the answer. At this point I whipped out my postal charges booklet and showed her the little paragraph about the new rate, effective 1.1.91.

Oh!" she said, "I'll have to ask about that." Anyway, a couple of minutes later, she returned to tell me that I could get $1.20 worth of stamps for each one now. ($1.20 is the average of the minimum and maximum listed above). Needless to say, this made me very happy, as the pile of IRCs I had in my hand had just increased in value by about 40 per cent. At this time, I handed over 151 IRCs and walked away with $181.20 worth of stamps. These same 151 IRCs were worth only $128.35 on 31 December 1990. The upshot of all this is that I think the postal people have finally got it right, ie an IRC costs $1.35 and you get $1.20 in stamps for it, which is a much better ratio than a $1.35 outlay for a $0.85 return, which was the case before. I didn't really mean to waffle on about IRCs so much, but most award and DX hunters will have quite a few of these, and may be selling themselves short by selling them for a small price, and probably will not be aware that their redeemable value has gone up. I would, at this point, also like to give full marks to the lady at Greensborough Post Office for her patience and understanding in counting out 151 IRCs etc. I have had some quite unpleasant experiences redeeming IRCs, but this was not one of them. So, anyone from Australia Post reading, please note we don't always give you bad press.

Address for awards

As you may or not know, the correct address for all correspondence for the Awards Manager is the address above (PO Box 300). I raise this, as I have had reports of people just giving my callsign and address in the callbook as the address for the WIA Awards Manager. This concerns me, as I don't want to end up in the same situation as previous award managers who still keep getting mail at their home address for years after relinquishing their role. So, if you are asked for the address for the WIA Awards Manager, please give the address at the top of the column.

Other Awards Available Through WIA

Last month I listed all of the WIA Federal Awards. This month I would like to list a few more awards from the ARRL for which I can verify the cards, to save sending them to the ARRL in the USA. These are very popular awards, and I feel it would be worthwhile to list the rules in full, and will endeavour to do so in the coming months when space permits. In the meantime, if you need a copy of the full rules, I will send them to you provided you send an SASE. I also have application forms which you will need to apply for these awards. I would also like to point out that I will be giving all cards for these awards a very close inspection, as my credibility as an awards manager is on the line. So, please, before sending, double-check cards to make sure they comply with the rules. In particular, pay attention to alterations of any kind, as well as making sure all the required information is listed.

You should also provide an SASE to enable easy return of your cards.

Worked All States

The WAS (Worked All States) award is available to all amateurs worldwide who submit proof (written confirmation) of having contacted each of the 50 states of the USA. The WAS awards program includes 10 different and separately numbered awards as listed below. In addition, ENDORSEMENT stickers are available as listed below.

Separately numbered awards —	OSCAR
	SATELLITE
	SSTV
	RTTY
	432MHz
	220MHz
	144MHz
	50MHz
	160m
Endorsements —	SSB
	CW
	NOVICE
	QRP
	PACKET
	EME
	ANY SINGLE BAND

VUCC

The VHF/UHF Century Club Award (VUCC) is awarded for contact with a minimum number of Maidenhead 2° x 1° grid square locators per band. The minimum number of squares needed to qualify for each individual band award is as follows:

50MHz —	100
144MHz —	100
432MHz —	50
1296MHz —	25
2.3GHz —	10
above —	5

WIA Grid Square Award (WIAGSA)

I will allow one month for input on these new amended rules, which take into account most of the feedback I have received. The rules in their present proposed form allow a person who operates from home to have just as much fun as someone who can operate only portable. There is a heavy emphasis on portable operation. I hope this will encourage as many people as possible to operate portable, perhaps from as many as 100 different grid squares. This will not only improve their own scores, but may assist up to 500 people to gain new squares. So, as you can see, there is something in it for everyone.

As for being able to work only VK stations, I was going to drop this completely. However, I think it would be a good idea to make it so that a small portion of the contacts need to be VK, to encourage contacts with VK stations, and also to give it an Australian flavour — hence rule 6(b). This is a compromise between the original and some of the letters I got. The VK content applies only to the basic award.

The minimum number of contacts needed to qualify has been reduced on some bands, as some felt them a little too high and, on reflection, I agree. My main aim is to get people qualified and then keep them chasing after update stickers. If you want something harder to chase after, try VUCC. I think it is important not to lose sight of the fact that if you are only interested in seeing how many different locators you can work from one QTH, then VUCC is your baby. This award seeks to be **different from others offered** as well as being a challenge. While your tally will not really be the actual number of different squares you have worked (if you use rule 5), it will, however, be a measure of the amount of effort you have put in.

I have tried to keep the rules so that they are interesting for all concerned.

Redrafted Draft Rules

1. (a) The Wireless Institute of Australia Grid Square Award (WIA GSA) is awarded for contact with a minimum number of Maidenhead 2° x 1° grid square locators per band as indicated in (b). Grid squares are designed by a combination of two letters and two numbers.

(b) The minimum number of squares needed to initially qualify for each individual band awards is as follows:

All HF bands, including WARC bands	—	100
50MHz	—	50
144MHz	—	30
432MHz	—	25
1296MHz	—	10
13cm	—	5
all bands above	—	5

2. Only contacts made on or after 1 January 1990 are creditable for this award.
3. a) Individual band awards are endorsable in the following increments:
   — All HF bands 25
   — 50MHz + 144MHz 10
   — 432MHz + all bands above 5
   b) Separate bands are considered as separate awards.
4. a) No crossband contacts permitted
   b) No contacts through active repeater or satellite devices or any other relay method permitted
   c) Contacts with aeronautical or maritime mobile stations do not count
5. Stations which operate portable or mobile from a different locator to their "home" locator may claim the locator they are operating portable from, by either of two methods:

1. work a station located in their "home" locator
2. or work at least five different stations outside the portable locator (on bands 1.2GHz and above work at least one station outside the portable locator).

6. All contacts for all of the individual band awards must be made from a location or locations within the same grid square, or locations in different grid squares no more than 50km apart. This will be called the "home" locator. Excepting contacts made under the provisions of Rule 5.
   b) A minimum amount of contacts for the basic award need to be made with stations located in Australia or its territories (ie any prefix VK0 to VK9) as per the table below:
   All HF bands 25
   50MHz 10
   All other bands 1
7. Endorsements will be available on request, ie how ever you want it endorsed is how it will be done.
8. a) QSL cards are not required. A certified log extract should be provided with the following information:
— Date, time, callsign, mode, frequency, grid locator and signal report sent by the station concerned and grid you are operating from, if portable.
   This list should be certified by an official of a society affiliated with the WIA, or by two licensed amateurs, reading as follows — "I/we certify that the enclosed list corresponds with the information contained in the said logbook."
   b) For those who would have difficulty in getting a certified list, photocopies of your logbook signed by the applicant certifying all the information contained within to be true and accurate can be certified by the awards manager.

Note: All entries must be legible.

9. The cost for each award is $A5 or eight IRCs for amateurs in Australia, or $US5 or eight IRCs for those outside Australia. Requests for endorsements should be accompanied by an SASE or one IRC and SAE.
10. This award is very much dependent upon the honesty of the operator. Any fraudulent applications will result in the disqualification of the applicant from all future WIA GSAs.
11. Any decisions regarding interpretation of the rules here printed made by the Federal Awards Manager are final and binding.
12. There will also be a standing list of the top five scorers on each band so that people can see just what is possible and what is being achieved. This may encourage those who think they will never reach their target. It will also give those who like a bit of competition something to aim for.

CQ Magazine Awards

In the January '91 column I made mention of the fact that Bill Vogel (VK5NVW) is an authorised checkpoint for *CQ* magazine awards, and can supply rules, application forms and check cards. I also mentioned that Bill didn't actually say so, but an IRC or SAE probably would be appreciated. Well, he wrote to me again and said yes, this is the case. He and the other voluntary checkpoint in Australia for *CQ* magazine awards do not receive any financial support from *CQ*, and therefore it is imperative that you include either SASE (prefers 9" x 4") or sufficient funds to cover envelope and postage. He informs me that VK6JS is also a checkpoint. Bills address is:

Bill Vogel
16 Wandilla St
Largs Nth
SA 5016

Charges for awards

You would not believe the number of applications for awards that I get with absolutely no IRCs or money. While I am aware that there is at least one awards guide that lists our awards as FREE, the majority of these moneyless requests come from one particular large and prosperous state in the USA. I find this rather amusing, as it would be the last place that you would think that anybody would be short of a quid. I remember when I used to get a lot of cards from the USA as FK1TS that nearly all the cards from this particular state sent no money or IRCs or SASEs. So if you are talking to someone who is thinking of applying for an award please remind them of the current charges: ($US5 or eight IRCs). I have a policy at the moment of sending awards to people who send less than the required amount and enclosing a very politely worded request for the additional amount of IRCs. I have had a very good response to this, with nearly everyone sending the difference. In most cases, the information they have lists the old amount ($2) as the price was put up only recently. Those who don't enclose any funds at all get put on the bottom of the pile, and that's how it will stay.

73 PHILL VK3JFE/FK1TS
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CONTESTS

NEIL PENFOLD VK6NE
CONTESTS CO-ORDINATOR

Alara Contest Results

As you can see the list is not very long this year — only 26 logs received! I am rather disappointed to find that at least 10 ALARA members who took part in the contest did not bother to send in their logs. Some of them would have had higher scores than some who DID send their logs! Come on girls — surely all of you can spare enough time to write that log and send it off — after all, you made time to participate on air. I am again daring to hope that the response will be better in 1991. It doesn't matter how small the score — let us all know YOU were there!

Alas there were NO novices on air this time, so there will be no Florence McKenzie award. I also found that some members had not re-read the rules this year, thus missing the alteration to the CW scoring! If YOUR score is less than you thought, that will be why — CW now only scores double points if one operator is a novice.

We suffered from some of the same problems again this year — lousy conditions and another contest! Our winner, Bev VK6DE, managed to turn the other contest to her advantage (losing sleep, but gaining points). Congratulations Bev on a great score — I think we'll all move to Geraldton for better DX! Congratulations also to Zdena OK2BBI for gaining the trophy as top DX YL. I tried to catch you Zdena, but just never got through! It is also a great pleasure to give Ivor VK3XB another certificate as top OM — good work Ivor.

Comments from those taking part:

Erika VK3AEB: I found everyone very friendly — it was not as competitive and aggressive as some contests.

Dawn ZL2AGX: Many girls I just couldn't copy — propagation was not very good.

Joy VK2EBX: I enjoyed the contest very much.

Elizabeth VE7YL: I could have worked 2000 OMs from Japan!

Poppy VK6YF: I think it would be difficult to find a weekend when there wasn't another contest.

Bron VK3DYF: Comment from an OM that YLs were chatting (that's why we're on, isn't it?) — another OM complimented us for giving correct signal reports.

Bev VK6DE: Took a week to catch up on lost sleep! Worked 31 members in seven countries, 41 YLs in 10 countries and worked 35 countries!

Meg VK5AOV: Thoroughly enjoyed the contest although it was hard work at times.

Anne ZL2BOV: Should have worked SWL as I heard many girls who couldn't hear me. (I know how you feel, Anne).

Diana G4EZI: See you all next year.

Dorothy VK2DDB: I enjoyed listening, and emptied the mending basket during the contest. (Yes, we knew conditions were bad — but . . .)

So there we are — another contest been and gone, but still enjoyed despite everything. I've enjoyed getting the logs, so keep them coming next year. See you then!

Results of the Tenth ALARA Contest, November 1990

Marilyn VK3DMS
Contest Manager

1.	VK6DE	Bev	816	Top score overall, top phone, top VK6 ALARA member, top VK YL trophy.
2.	VK3CYL	Kim	550	Top VK3 ALARA member
3.	VK3KS	Mavis	328	
4.	VK6YF	Poppy	258	
5.	VK3EBX	Joy	256	Top VK2 ALARA member
6.	VK5AOV	Meg	216	Top VK4 ALARA member
7.	VK3AEB	Erika	213	
8.	VK3XB	Ivor	207	Top OM
9.	VK5BMT	Maria	152	
10.	OM6BBI	Zdena	141	Top Czech ALARA member, top DX YL trophy
11.	GM4YMM	Christine	117	Top European YL non-member
12.	VE7YL	Elizabeth	107	Top VE ALARA member
13.	ZL1ALK	Celia	104	Top ZL ALARA member
14.	ZL2AGX	Dawn	103	
15.	VK3DYF	Bron	94	
16.	ZL2BOV	Anne	94	
17.	G4EZI	Diana	87	Top UK ALARA member
18.	DF2SL	Anny	82	Top German ALARA member
19.	VK4VR	Val	80	Top VK4 ALARA member
20.	VK3DVT	Valda	76	
21.	VK3XF	Les	75	
22.	VK5ANW	Jenny	55	
23.	VK2DDB	Dorothy	53	
24.	WA2NFY	Lia	51	Top US non-member
25.	WB3CQN	Ruthanna	40	Top US ALARA member
26.	VK3DMS	Marilyn	Check log	

13 VK ALARA members
3 DX ALARA members
2 DX YL non-members
2 OMs — 26 logs in total

1990 K-ZL Oceania
VK and ZL Phone Results

ZL PHONE	160M	80M	40M	20M	15M	10M	
ZL1BVK	1600	8820	19758	416	1450		158064
ZM1IM		420	40	324	48480	1950	101232
ZL2AFY		31200					31200
ZL2ANR	5200						5200
ZL3TX	2240	8360	45	289	1188	32	59422
VK PHONE							
VK1NTW					62920		62920
VK1PJ		2340		22852	108480	103600	794555
VK1ZX					63250	10494	125664
VK2APK	420	2400	450	47300	133176	20856	774276
VK2AYK	160	2100		9744	67056	7980	303008
VK2BAM		160		1254		20424	39294
VK2CCK						67944	67944
VK2CJH		960		256			3264
VK2CKW		2400		196	3780	850	31312
VK2PS	1080			2958		1936	25754
VK2PWS					12850	60962	213962
VK3DZM		60140					60140
VK3SM		1260		3591			13398
VK4LT						297850	297850
VK4MWZ					217404		217404
VK4NEF	960				62118	38272	231702
VK4OD						17820	17820
VK4PJ		160	10		33464	1680	66640
VK4YB	6300	13800	36180	72877	12772	6000	1060645
VK5GN						77004	77004
VK5HB		490		48840	51360	30096	431680
VK5PJV		250			70692	20770	182508
VK5QX				145672			145672
VK6ANC			6510	4524	27548	50160	304288
SVK6HQ		4680		16611	32	180	62640
VK7MC						14040	14040
VK8BE						264	264
VK3AEO	Check Log						

VK AND ZL CW RESULTS							
ZL CW	160M	80M	40M	20M	15M	10M	
ZL1AIH			314860				314860
ZL1AIZ	180	9250	68160	7000	14060	8512	512568
ZM1BSG					82360		62360
ZM1HV		1080	14400	3588	2400	17120	171477
ZM2AGY		2160	39050	19008	45310	8030	522006
VK CW							
VK2APK	80	2210	96120	83640	50096	13936	1117754
VK2BQQ		1760	15870	26040	48108	19500	516890
VK2DID		1080	6450	3408	46736		165636
VK2CWS					42180		42180
VK2KM			40150	4218	52216	27632	464440
VK2PS	320	1620		9796	1040	7280	94464
VK3AOR		880			35148		47742
VK3EGN				137160	125280	20124	768108
VK3MJ				29016			29016
VK4DWA					78880		76880
VK4MWZ					5934		5934
VK4OD						18576	18576
VK4TT				143716			143716
VK4XA						184896	184896
VK5ZN				3036	8	8	4264
VK6AJ					49184	124806	330694
VK6HG		40	10	8892	10450	32032	154080
VK6HQ				11284	98	17928	64074
VK6NZ				54587			54587
VK6ZH				2050	2300	31310	75485
VK7GB						286	286
VK7RY		100		270	448	32	5846
VK8AV		30250	14850	41600	40460	21746	778674
VK8BE						2240	2240

From R J Litten ZL1AAS VK-ZL-0 Contest Manager

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AUSTRALIAN TELEVISION FREQUENCIES

Ch	Limits	Video	Audio
0	45-52	46.25	51.75
1	56-63	57.25	62.75
2	63-70	64.25	69.75
3	85-82	86.25	91.75
4	84-101	95.25	100.75
5	101-108	102.25	107.75
5A	137-144	138.25	143.75
6	174-181	175.25	180.75
7	181-188	182.25	187.75
8	188-195	189.25	194.75
9	195-202	196.25	201.75
10	208-215	209.25	214.75
11	215-222	216.25	221.75
28	526-533	527.25	532.75
28	533-540	534.25	539.75
30	540-547	541.25	546.75
31	547-554	548.25	553.75
32	554-561	555.25	560.75
33	561-568	562.25	567.75
34	568-575	569.25	574.75
35	575-582	576.25	581.75
36	582-589	583.25	588.75
37	589-596	590.25	595.75
38	596-603	597.25	602.75
39	603-610	604.25	609.75
40	610-617	611.25	616.75
41	617-624	618.25	623.75
42	624-631	625.25	630.75
43	631-638	632.25	637.75
44	638-645	639.25	644.75
45	645-652	646.25	651.75
46	652-659	653.25	658.75
47	659-666	660.25	665.75
48	666-673	667.25	672.75
49	673-680	674.25	679.75
50	680-687	681.25	686.75
51	687-694	688.25	693.75

Ch	Limits	Video	Audio
52	694-701	695.25	700.75
53	701-708	702.25	707.75
54	708-715	709.25	714.75
55	715-722	716.25	721.75
56	722-729	723.25	728.75
57	729-736	730.25	735.75
58	736-743	737.25	742.75
59	743-750	744.25	749.75
60	750-757	751.25	756.75
61	757-764	758.25	673.75
62	764-771	765.25	770.75
63	771-778	772.25	777.75
64	778-785	779.25	784.75
65	785-792	786.25	791.75
66	792-799	793.25	798.75
67	799-806	800.25	805.75
68	806-813	607.25	812.75
69	813-820	814.25	819.75

New Zealand VHF Channels

1	44-51	45.25	50.75
2	54-61	55.25	60.75
3	61-68	62.25	67.75
4	174-181	175.25	180.75
5	181-188	182.25	187.75
6	188-195	189.25	194.75
7	195-202	196.25	201.75
8	202-209	203.25	208.75
9	209-216	210.25	215.75
10	216-223	217.25	222.75
11	223-230	224.25	229.75

TV Carriers: 45-64MHz
All Australian stations are shown, but the NZ list includes only high-powered stations.
NZ1, NZ2 = BCNZ Network 1 or 2. /T=transistor

Ch	Video	Audio	Call	Location	Pol	Pwr
1	45.240	50.740	NZ2	Mt Studholme	V	100k
			NZ1	Te Arohe	V	100k
	45.250	50.750	NZ1	Kaukau	H	100k
			NZ1	Hedgehope	H	100k
	45.260	50.760	NZ2	Hikurangi	H	100k
			NZ1	Whakapunake	H	100k
0	46.172	51.672	DDQ	Toowoomba	H	200k
	46.240	51.740	ABMN	Wagga	H	100k
			ABSN/T	Cooma	M	35
			ABUN/T	Glen Innes	H	25
			ABWN/T	Nuroona	H	500
			ABNT/T	St Helens	H	30
	46.250	51.750	ABN/T	Goulburn	V	50
			ABMQ/T	Nebe	H	100
			ABNQ/T	Gordonvale	H	500
	46.258	51.758	ABCN/T	Wallsend	H	100
	46.260	51.760	NEN/T	Tamworth	H	1k
2	55.240	60.740	NZ1	Waiatarua	H	100k
	55.250	60.750	NZ1	Wharite	V	100k
	55.260	60.760	NZ1	Dunedin	H	100k
1	57.100	62.600	ABNT/T	Wynyard	V	1k
	57.240	62.740	NEN/T	Waicha	H	100
			ABSN/T	Eden	H	50
			ABGV/T	Elidon	H	5
			SEQ/T	Gympie	V	3k
			ABTQ/T	Townsville N	H	10
			ABT/T	St Marys	V	100
	57.250	62.750	ABTN	Taree	V	100k
			ABAV	Albury	H	100k
			ABNQ/T	Mareeba	H	16
			ABGS	Mt Gambier	H	100k
			ABNS	Port Pirie	V	100k
			ABNT/T	Launceston S	H	30
	57.258	62.758	ABCN	Orange	V	100k
			NBN/T	Murrurundi	H	50
			TNQ/T	Bowen	H	5k
	57.260	62.760	ABEV	Bendigo	V	100k
			ABSQ	Warwick	H	100k
			ABNQ/T	Babinda	V	300
			ABT/T	Rosebery	H	50
	58.350	63.850	ABWQ/T	Monto	V	1.2k

This data is an overflow from the February data issue – it simply wouldn't fit. Ed)

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HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

Like the solar cycles, WARC (World Administrative Radio Conference) gatherings come and go at regular intervals. The last one was at the end of 1979, the next one will be held early in 1922 in Spain.

One would ask, "What has WARC to do with DXing?" The answer is simple: quite a lot! "Our bands" ("our bands" by the grace of the politicians and the administrative apparatus behind them who allocate these bands to us) are under threat again. As the population of the earth grows, so grows the pressure for new allocations in the spectrum. The win for certain parties must mean a loss for others. Radio amateurs who, since World War I, pioneered by experimentation and research the application of communication in the "useless spectrum 200 metres and under", will be ultimately the losers.

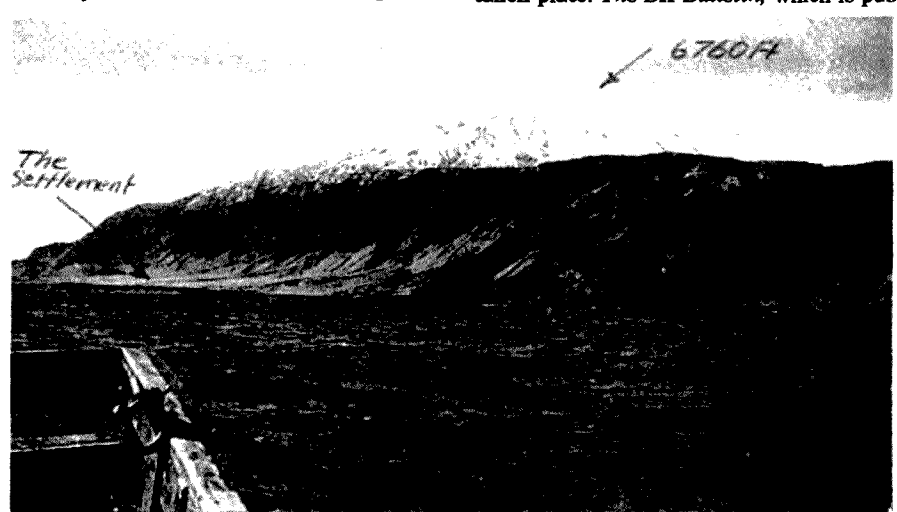
Government demand — political, economical and military — claims more and more of that part of the spectrum which was traditionally regarded as belonging to radio amateurs. Under threat are the HF bands, especially 7MHz, and the VHF, UHF and SHF bands. The demand for allocation for satellite communication, digital and wireless personal communications — the point to point — is growing every day.

What can the ordinary amateur, the hobbyist in the true sense, do to defend "our" bands?

We should all rally behind our national amateur organisations (WIA, NZART etc) which decided to represent us, the members, at the crucial negotiations in Spain. Rally not only in spirit, but also with money. We all know that representation costs money. You, as a DXer, can help. Please send your donation to your WIA Division, with the specific request that it should be forwarded to the Federal Office for the "WARC Fighting Fund". We need all your help to retain our present band allocations.

Albania — ZA

It was in the middle of last year when the first rumours started to emerge about a proposed Albanian activity. Peter HA5WE and Zoli HA5PP, known from their Vietnamese experiences, were the ones who, according to expert observers, were to carry the torch of amateur radio back into Albania. Nine months later, the proposed expedition has not yet taken place. *The DX Bulletin*, which is pub-



The snow covered peaks of Tristan du Cunha

lished in the USA, has surveyed its 9000 readers about the most wanted countries as far as DX is concerned. On the top of the lengthy list is Albania. Eighty-nine per cent of the readers need this country. However, some small progress has been made. The October 1990 issue of the *News Bulletin of the MRASZ* (The Hungarian Radio Amateur Society) published some facts about the proposed activity:

a) There is now an agreement between the Hungarian and the Albanian Radio Amateur Societies that there will be a future DXpedition to Albania for a period of 15 or 20 days, with the participation of 10 amateurs. This agreement has to be approved and ratified by the relevant Albanian authorities.
b) An Albanian amateur delegation has visited Hungary, including the President of the Albanian Amateur Radio Society.
c) The MRASZ has called for volunteers to take part in the expedition. All the chosen expeditioners have to pay their own expenses. So far, 19 amateurs have applied, but only 10 will be selected according to a very strict selection criterion.

It appears that the fate of the Albanian DXpedition hinges now on the political development in Albania, and is subject to the approval of the Albanian authorities.

Afghanistan — YA0RR

This is the third-most-wanted country in the survey conducted by *The DX Bulletin*. Seventy-six per cent of the readers need this country for their DXCC certificate. This demand was somewhat reduced during January 1991. Romeo Stepanenko (see February *AR)* came up on the bands on 5 January. His appearance was preceded by some pirate activity. He was allowed to use only 30W output and wire antennas, due to the hostilities which are still around Kabul, the capital of Afghanistan. The proposed move to a different location with greater power and different antennas did not eventuate.

Romeo and his friend Larry YL1WN were very active on CW with only an occasional call towards VK/ZL. A few lucky VKs worked them; others (including yours truly) have heard them but were not able to work them. Some others did not even hear them. The bedlam on 14195 and at 1255 UTC on 21295 had to be heard to be believed. In my opinion, the behaviour of some amateurs was worse than when Bouvet was on. The Europeans came to the fore with rude and derogatory comments about each other's ancestry and nationality. There were quite a number of false reports acknowledged by "policeman". It still amazes me that some so-called DXers do not know what a split frequency is, and how to handle it. They barge into the mob and do not listen before. Romeo closed the YA station on 21 January. The QSL information is not quite clear on this operation. Some DX publications say that you should send your cards to: Romeo Stepanenko, Box 812, Sofia, 1000, Bulgaria; others advocate the old Moscow address: Box 308, Moscow, 103009 USSR. Take your pick. At the end of January, unconfirmed reports said that Jackie F2CW, who is connected with the International Red Cross, was active from Kabul as YA0/F2CW.

Canton Island — Kiribati — T31

During the past year, all the call areas of this island nation (T30-T32-T33) were activated except T31. Kiyoko, the Japanese lady DXer, known also as NH6RT, T30KY, ZK1BY, ZK1XY, T22KY, YJ0AKY, 5W1HM, ZK3KY etc — who missed the Banaba T33 operation — managed to activate Canton Island on her own, under the callsign T31KY. She was heard on the usual DX frequencies. Now we are all waiting to receive the magical card from: Kiyoko Yamakami, Box 3, Tokaimura, 31911, Japan.

Saint Helena ZD7, Ascension ZD8 and Tristan Da Cunha ZD9

Bill VK4UA was kind enough to supply me with some information about the amateur activities on the British Islands in the Atlantic. Bill tries to maintain regular skeds for the benefit of VK-ZL-Pacific DXers, with these islands along the following lines:

ZD7 around 2000 to 2100 UTC. ZD8 the same time, on the hour on the calling frequency of 21260.

ZD9 around 0700 to 0715 UTC on 14165kHz long path. For the novices there is a possibility at 2100 UTC with Bob ZD8BOB on 21195kHz.

These are the stations which you might be able to work: ZD7DP Desmond, QSL to Box 86, St Helena Island, South Atlantic. Maggie ZD7SM (XYL of Desmond) ZD7VC, Bruce, Box 58, St Helena, South Atlantic. The island covers 48 square miles, with a general population of 5000 to 6000, and with 11 active amateurs, who are all anxious to contact their VK/ZL counterparts. The best path is over VE7 between the hours of 1900-2100 UTC on 21260kHz. The mail boat comes to St Helena around every five weeks. ZD8BOB Bob, PO Box 2, Ascension Island, South Atlantic. He can be worked around 1900 to 2100 UTC on 21260kHz long path. ZD8LII Steve, Box 2, Ascension Island, long path, same time. ZD8DX Dave, 2015 UTC. QSL to: WB2K. Bob is keen on propagation reports and checks regularly on 14165 kHz at 0700 and 0730 UTC long path for VK, and shortpath for ZL. The area of Ascension Island is 34 square miles, population about 1200, 12 radio amateurs, of which six are active. Green Mountain is about 2600 feet high. ZD8 has the second longest airstrip in the world and gets an almost daily air service. ZD9 Andy and his wife Lorraine ZD9C0 can be heard every second Monday on 14165kHz long path, around 0700 UTC, and they can also be found on 21330kHz around 1950 UTC, long path. (See Nov 1990 issue of *AR).*

Saint Peter and Saint Paul Rocks — PY0S

I have some further news about this proposed DXpedition. (See February *AR).* The rocks are located at 0° 56' north latitude, and 29° 21' west longitude, about 1100km east of the coast of Brazil in the Atlantic Ocean. This will be the second DXpedition to these tiny rocks by the Natal DX Group, Brazil. (See article about the 1989 expedition in August 1990 issue of *AR).* There will be two stations, both active at the same time, 24 hours a day, on SSB, CW and RTTY, from 10m to 160m, including the WARC bands. Transportation will be in a 15m-long sail-boat, and the trip will take five days. Total cost of the expedition is $US11,050, of which the members of the expedition have already contributed $US2500. They still need $US8550 to get the expedition under way. Send your donation by registered letter to: The Natal DX Group, Caixa Postal 597, 59022 Natal, RN, Brazil.

Maritime Mobile

Hungary is in the middle of Europe and is not known as a maritime nation. However, from time to time it produces some extraordinary navigators. The latest is Steve HG5S/MM. He left Gibraltar on 29 July last year, sailing single-handed in a 31ft sloop, the "Salammbo" around the world, with only one stopover, in Fremantle, Western Australia in December 1990. There he attended to some urgent repairs to his boat, replenished his provisions, and on 29 December left the shores of VK6. He kept in constant touch with the "Travellers' Net" on 14116 each day. The net is under the control of Roy VK6BO. When sailing south of New Zealand, he joined the maritime net of Tony ZL1ATE, assisted by Les ZL1BIN, who gave Steve the daily weather reports. Steve expects to complete his circumnavigation of the earth on 29 June 1991. When I caught up with him in a QSO at the end of January, his position was 48° 45' south latitude, and 176° 41' west longitude, on his way towards the Horn. Steve expressed his thanks to the VK6 amateurs who were kind enough to make a considerable cash donation towards his repair costs. He is financing the whole trip himself, and does not have any sponsors. He confessed to me that basically he is a "yachtie", however this voyage opened his eyes as far as the amateur fraternity is concerned, and he is grateful for the assistance and help he received via the medium of amateur radio. he has an FT747GX on board. He admired the selfless dedication of the various net control-

lers, and asked me to convey his personal thanks to all those who helped and assisted him whilst in the VK and ZL waters.

Speaking of yachties, our readers might remember the other Hungarian sailors Nandi and Joe who, in 1986/87, sailed around the world in a small sloop, equipped with amateur radio and the callsign HG4SEA/MM. One of these adventurers, Nandi, surfaced in January 1991 as one of the participants in the BOC single-handed Around the World Boat Race. This race is for the Big Boys. He carries amateur radio again, and his callsign is HA4WM/MM, and his next stop will be in Punte Este, Uruguay at the beginning of March 1991.

Niue — ZK2

Eli HA9RE and Miki HA8XX were operating from Niue late January to middle of February as ZK2XA and ZK2XB. From there they went to the South Cook Islands: ZK1. Whilst on Chatham Islands ZL7, they made 31,000 QSLs. QSL to their manager: DJ1ND (See February *AR).*

Interesting QSOs and QSLs *Information*

Note: callsign, name, frequency, mode, time in UTC, months of QSO. ADAR = QSLinfo

* 8P9/XE1L-Luis-14160-CW-2158-Dec. QSL to: WA3HUP=ADAR.

* 7Q7RM-Ron-28030-CW-1252-Dec. QSL to: K6KII=Clifford G Moore, PO Box 1338, Arcadia, 60611, Ill, USA.

* A92C-Ravi-14015-CW-1708-Dec. QSL to: The Manager, PO Box 10043, Bahrain, Middle East.

* TU4CO/TT8-Antonio-14012-CW-1730. QSL to: The Manager, BP7, MerleVenez, 56700, France. Antonio has only verbal permission to operate.

* ZS6/G3SGQ-Ron-21013-CW-0642-Jan. QSL to: home call via Bureau.

* TR1XX-Paul-14025-CW-2041-Jan. Not yet in the callbook. Try to send to: AGRA, Box 1826, Libreville, Gabon, Africa.

* FP5HL-Henri-14027-CW-2133-Jan. QSL to: Henri Lafitte, Box 1107, Saint Pierre Island, Atlantic Ocean.

* 7X5AV-Djamal-14033-CW-0800-Jan. QSL to: Djamal Bendaud, Maison De Jeunes, 23, Bou Saada, Algeria, Africa.

* 5T5/N5JRC-Gene-21298-SSB-2152. QSL to: WA5ZIJ Gene A Hill, 1828 N Harco Dr, Baton Rouge, LA, 70815, USA.

* C53GH-14240-SSB-2012. QSL to: The Manager, PO Box 92, Banjul, The Gambia, Africa.

* V63NW-Bob-14226-SSB-1223-Jan. QSL to: DF6FK via the Bureau.

* CE0ZTY-Rosita-(YL)-14143-SSB-1133-Jan. QSL to: Ms Rosita Rojas, PO Box 1972, Valparaiso 1, Chile, South America.

* ZP5CGL-Carlos-21244-SSB-0514-Jan. QSL to: The Manager, Box 512, Asuncion, Paraguay, South America.

* OA4BHM-Gloria-(YL)-14222-SSB-0557-Jan. QSL to: Gloria Maria Munoz De Layness, PO Box 4939, Lima, 100, Peru, South America.

* 9M8AJ-Alan-14192-SSB-1104-Jan. QSL to: AA5AZ Alan J Clarke, 1102 Lake Ave, Metairie, LA 70005, USA.

* 4Z80TA-Udi-14188-SSB-0536-Jan. QSL to: Home Call 4X6ZM via Bureau.

* KP2J-Pat-10101-CW-1050-Jan. QSL direct only: Henry T Miller, PO Box 1853, Charlotte Amalie, Virgin Islands, VI 00801 USA.

*V63JC-Father Cav-14226-SSB-1149-Jan. QSL to: Joseph A Cavanagh SJ, PO Box 39, PATs, Pohnpei, FM 9641 USA.

*9Y4SF-St Clair-14226-SSB-1139-Jan. QSL to: St Clair Forde, Cardi Uwi, Saint Augustine, Trinidad, West Indies.

*XF3RGS-Salvador-14166-SSB-0628-Jan. QSL via the XE Bureau or direct: The Manager, PO Box 1, Cancun Island, Yucatan, 77505, Mexico.

RTTY News

Syd VK2SG supplied the following information:

* UF6FJ-21087-1240Z. QSL to: Box 120Tblisi, 380008, Georgia, USSR.

* ES1RA/UI5F-14083-1450Z. QSL to: Box 806, Tallin, 200017, Estonia.

* A92FG-14073-2000Z. QSL to: Box 22381, Muharah, Bahrain, Middle East.

* YS/WD4IFN-21083-1517Z. QSL to: Herman H Franks, US Embassy, APO Miami, 34023, Fla, USA.

* UL7LR-14085-1505Z. QSL to: Box 97, Dzhetygara, 459430, Kazakh, USSR.

* VP8CEL-21091-0052Z. QSL to: G4PVM.

* LY2BBF-21084-1233Z. QSL to: Box 1029U, Vilnius, Lithuania, 232012, USSR.

* ZB2JB-21088-2020Z. QSL to: Box 292, Gibraltar, Europe.

* VP2EE-21087-1335Z. QSL to: KA3DBN.

* 3B9FR-14091-1902Z. QSL to: Box 31, Rodriguez Island via Mauritius, Indian Ocean.

* 9M6/JH1ROJ-21086-0229Z. QSL to: Home call.

From Here and There and Everywhere

* Bernhard DL2GAC is on a South-East Asia-Pacific DXpedition. He left Germany in January and will operate in the next five months as VU2BMS-9V in Singapore, YB5NOC-9M2QR-9M8QR-DU1 in the Philippines, C21 in Nauru, H44MS and other localities. Bernhard is a strong supporter of the IOTA award system, and is asking stations working him to make one contact per island only.

* Please note: when sending direct QSLs to Pakistan send IRCs only. Green stamps are not welcome there if they are sent via the mail.

* From 3 February, the airmail postage from the US to other parts of the world will be US$0.50 instead of the 45 cents which was charged until now.

* According to Eva PY2PE, Crozet Island will be activated by FT4WC. He was heard on 14115 at 1600 UTC.

* Some of you might be interested to know how the VK DXers rank in the ARRL DXCC Honour Roll. The full list was published in the November issue 1990 *QST* Magazine. Mixed: VK5WO-320/349, VK6DH: 320/339, VK3YL: 319/355— VK6HD: 318/337— VK4QM: 316/364 — Phone: VK5WO: 320/346 — VK6RU: 320/367— VK6HD: 319/337— VK5MS: 318/362— VK6LK: 318/334 — VK4LC: 315/348. It is interesting to note that no VK station is listed on the CW section of the honour roll. The above list is eight months old, and since that date some changes might have occurred.

* The well-known "Greenpeace" Antarctic Station, Marcus ZL0AIC, closed down on 11 January. His service time expired and he went home. However, you can now have a contact with K5AFJ/ZL5 Walt, who is now on "World Park Base", Ross Island, Antarctica. QSL to home call.

* We might be lucky. It was reported early in January 1991 that Italian technicians are installing three complete radio stations in Ethiopia. IK6DPW is already in the country and hopes to get a licence to be active sometime in February. QSL will go to: I8YCP.

* There was a particularly good opening on shortpath on 13 January to XQ0X. John CE0ZAM, with the help of Mickey CE3ESS, has worked dozens of VK/ZLs. (See January issue of *AR).* John hopes to have his 80m band antenna up in February/March.

* UG1700GAW was celebrating 700 years of Christianity in Armenia. QSL to: UG6GAW.

* Jim VK9NS hopes to be in Bangladesh by the end of February for a few weeks of activity. He also said that he will go to Bhutan with Kirsti VK9NL for two weeks around 3 May. Both destinations are very much sought-after locations. S2 is needed by 62 per cent and Bhutan is needed by 55 per cent of the readers of *The DX Bulletin.*

* QRM, either accidental or intentional, is the curse of the DXer. When talking to Luis CU2EL he bitterly complained about the QRM on 40m when he attempted to have a contact with EA0JC — who is none other than the Spanish King Juan Carlos with the QTH in the Madrid palace.

Monitoring Zedan's net (JY3ZH, 14250) the other day, I was surprised to hear an angry American amateur demanding from Zedan that he should bring JY1 up on the frequency. He wanted to discuss the present Middle East situation with the absent JY1. I think most of us know that JY1 is none other than King Hussein of Jordan. Zedan politely told our friend that JY1 is now busy with non-amateur activities.

* The "HE" prefix can be used by Swiss amateurs during the year of 1991. The Swiss are celebrating the 700th anniversary of the establishment of the Federation of the Swiss

Cantons into one nation. I worked HE7CSA, who happens to be the Award Manager of the Swiss Radio Amateur Society (USKA).

* Had a QSO with Mark VK0ML who is a scientific research officer on Macquarie Island. He is very busy in his profession. He is not a DXer, and uses amateur radio to communicate with his home base in VK5. Here and there he will have a chat with whoever happens to pass by. VK5AHI will collect Mark's cards, addressed c/- VK5AHI, only through the Bureau. Do not expect a reply in a hurry. Mark will reply only after his return to the mainland.

* If you worked T32LN, he is Mr Tekinaiti Kaiteie, and his address is: c/- Ministry of Line and Phoenix Islands Group, Republic of Kiribati, Pacific.

* The well-known net controller, Gray VK4OH ("Family Hour" net 14226.5 at 1100 UTC) has reported recently that in the first 26 days of 1991, 78 different DX countries have checked into that net.

* I was surprised to hear Ian VK5QX active one night from Western Samoa as 5W1JI. Ian was on a very hectic antenna erection tour of duty in the islands, and hoped to work also from Fiji as 3D2QX, and from Tonga as A35QX.

* Jean Louis 6W6JX advises that he discontinued the use of QSL managers. All cards only direct to him: PO Box 200, Kaolack, Senegal, Africa.

* If you hear VK0KC, he is Jim, who just arrived at Casey Base, Antarctica. His QSL manager is Graham VK4BB.

* Karl WB4BCQ, one of the US net controllers on the "Family Hour" net, became a silent key early in January. His rasping voice and his southern drawl will be missed on the bands by many of his friends.

* The 42nd International DX Convention will be held at Visalia, California from 12-14 April this year. If you intend to go, contact Louese Bloom KA6ING urgently at 2520 Heather Lane, San Bruno, CA, 94066 USA. On the other hand, if you wish to attend the 40th Dayton Hamvention (the prescribed pilgrimage for all amateurs) that will take place on 26-28 April. Your contact address is: Dayton Hamvention, Box 1446, Dayton, OH 45401, US.

Interesting QSLs received

It looks like the postal service — direct and QSL Bureau — has stopped?! Any info from others? Are you regularly getting your QSL cards? Drop me a line . . . Direct QSLs received: FW0ET (15W FM OP), T33WV (4W FM OP).

Thank You

I appreciated the help, support and contribution from: VK2DID, VK2SG, VK4BB, VK4DA, VK4OH, VK4UA, VK5WO, VK6PY, VK9NS, HA5HR, HA6NF and the DX bulletins: *QRZ DX* and *The DX Bulletin*. Many thanks to all of you. Without your help this column would not be possible. Keep the information rolling in.

GOOD DX AND 73.
ar

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074
PACKET: VK5EA@VK5WI

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz
(7.064MHz is the frequency presently in use)
AMSAT SW Pacific 2200 UTC Saturday, 14.282MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia, and now has over 310 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia, addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disc and a nominal donation of $10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available, and other AMSAT Australia services, send a SASE to Graham.

AO-16 Notes 13Jan91 from NK6K

Contents:
Comments on <REJ> frames and TNC parameters
Comments on not interfering with software reloads
Comments on uncorrectible SEU file errors

REJ Frames

I've noticed, from watching the downlink, that several users either don't have the proper TNC parameters set, have deaf receivers, are running way too much power, or are transmitting on the wrong frequencies.

The problem is that you are getting <REJ> frames sent to you. This means that PACSAT has received an <I> frame that is out of order or it has received one that it has already seen. This can happen when you are sending data, either uploading a file, or requesting a DIR or download.

The most common reason for getting <REJ> frames is that you transmit more than one frame in a burst (maxframe>1), and the satellite misses the first frame. You then get a <REJ> for the second. As has been recommended several times, you should have maxframe set to 1 for best results, so this should never be the reason. (Hint: change maxframe to 1 if it isn't already).

Another reason is that your TNC times-out before the <rr> frame in response to your <I> frame is sent. Because the downlink is being shared by frames to several other users in addition to telemetry frames, there could be a 2-6 second delay before an <RR> is transmitted. If you have your FRACK set less than 6, you could be retransmitting when you don't need to. (Hint: change FRACK to 6 or larger if it isn't already.

Another reason is that you missed the <RR> (ack) for the frame you sent. Since the <RR> is the shortest frame, and therefore the easiest to receive, either you have a local noise problem or you have a problem with your receive setup. Of course, the more acks you miss, the more time you spend on the uplink, and the less time everyone else gets. This being amateur radio, we encourage experimentation, testing with omni antennas etc, so if this is what you are doing, no problem. However, if you've got store-bought equipment and tracking antennas, there is no excuse for missing acks, something needs adjusting. Get to work.

The final reason for seeing <REJ> frames on the downlink is that you are getting into more than one receiver. The microsat receivers are more sensitive than required for the average user ground station. An AO-13 class station, with 1000W eirp, will probably be heard by more than one receiver at a time, resulting in multiple copies of the same packet being placed in the input queue. Because

there are multiple receivers, all running with interrupts and DMA, the doppleganger packet might not appear directly after the real one in the queue, so they can't easily be filtered out on the spacecraft. In addition to wasting time on the downlink by causing unnecessary <REJ> packets, you are also blocking adjacent receivers from other users.

You can solve this problem by reducing the uplink power, checking to make sure your deviation is 3.5kHz or less, and that you aren't transmitting between receiver frequencies. If tracking doppler by hand, start the pass about 2kHz lower than the published frequency, and end up 2kHz higher than the published frequency. Yes, this is the reverse of the direction the downlink receiver moves. On downlink, you are moving the receiver lower to make up for fast moving fixed frequency transmitter, which appears to be sending at progressively lower frequencies. On the uplink, you are compensating for a fixed receiver, which is hearing you on progressively lower frequencies, so you move your TX frequency up. Trust me on this.

You can see if you are having problems in this area by having a friend watch the downlink while you are logged on. Use the PB header option. If you see too many <REJ> frames sent to you, you have one of the above problems.

While on the subject of TNC parameters, you should set DWAIT to 0. There is no advantage in holding off via this parameter on AO-16. You should also do some testing to determine the proper setting for your TXDELAY parameter, setting it too large wastes channel time. This can be done by ear with a local receiver, or experimentally by digipeating frames while adjusting TXDELAY.

Software reloads

We will, from time to time, be reloading the PACSAT software. We usually try to broadcast a file warning of this a few days in advance. We will be reloading again sometime in the next seven days to add the file wash feature discussed below. If you transmit while we are reloading, it can slow the reload.

If you are having trouble getting connected or digipeating, make some attempt to determine the state of the satellite. On the reload last weekend, all the command stations reported having difficulty getting into the spacecraft. We can only assume that the problem was several users trying to digipeat or connect, even though the BBS was not running and digipeat was turned off.

One user appears in the log with a log-in two seconds after the STARTUP log entry. This user was probably trying to connect from the start of the pass, and had been interfering with the upload for the previous four minutes.

Here is how to tell what state the BBS is in.

By sight: If you see packets to QST-1, the BBS is up. If you see BBSTAT packets, the BBS is up. If you see packets from PACSAT-

SATELLITE ACTIVITY FOR OCTOBER/NOVEMBER 1990

1. Launches

The following launching announcements have been received:

Int'l No 1990-	Satellite	Date	Nation	Period min	Apg km	Prg km	Inc deg
093A	INMARSAT-2 F1	30 Oct	USA	10h45m	36118	198	23.6
094A	GORIZONT 21	03 Nov	USSR	23h51m	35688		1.4
095A	USA-65	13 Nov	USA				
096A	COSMOS 2103	14 Nov	USSR	92.8	430	410	65.0
097A	STS-38	15 Nov	USA	88.6	221	215	28.4
098A	COSMOS 2104	16 Nov	USSR	90.6	387	247	62.8
099A	COSMOS 2105	20 Nov	USSR	11h49m	39339	606	63.2
100A	SATCOM I	20 Nov	ESA				
100B	GSTAR IV	20 Nov	ESA				
1010A	MOLNIYA 1-79	23 Nov	USSR	12h15m	40593	654	62.9
102A	GORIZONT 22	20 Nov	USSR				

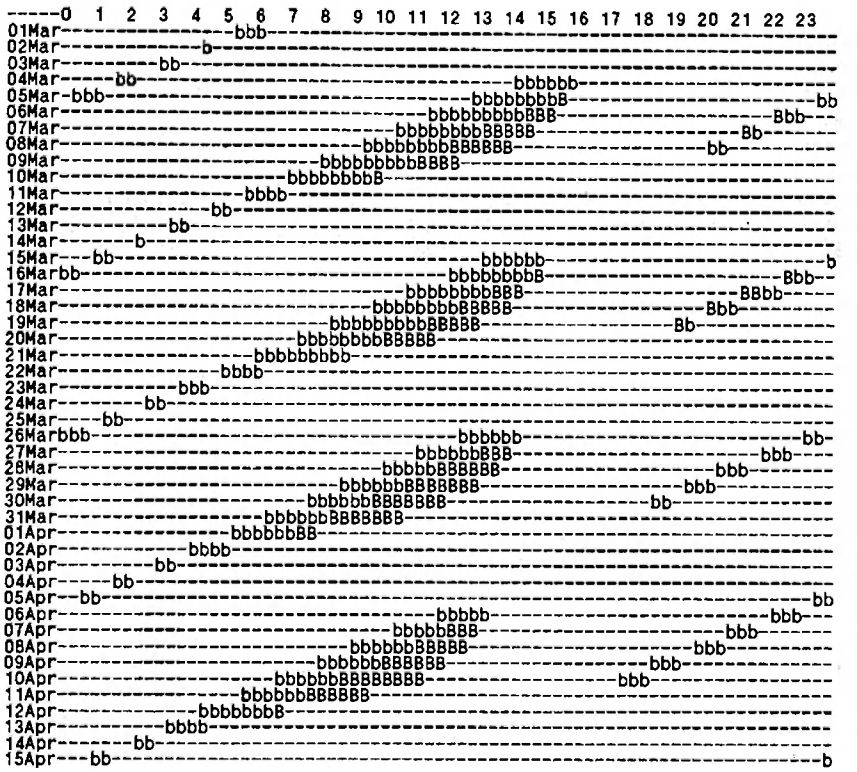
2. Returns

During the period 32 objects decayed, including the following satellites:

1968-017A	EXPLORER 37	16 Nov
1990-012A	COSMOS 2059	12Nov
1990-033A	COSMOS 2072	21Nov
1990-097A	STS-38	20Nov

Bob Arnold VK3ZBB ar

OSCAR-13 Schedule for 01Mar91 to 15 Apr91
Station: Adelaide
Hour – UTC



12 or PACSAT-11, the BBS is up.

Otherwise, if you see packets to LDR, we're loading. Don't transmit.

If you see LSTAT packets with d:0 instead of d:1, then digipeating is off. Don't try to digipeat.

By ear:

If you hear constant packets, the BBS is probably up.

If you hear a short packet about every two seconds, we're probably loading.

We don't expect that you always check the state of the satellite before transmitting. We would expect, however, that after a few unsuccessful log-on attempts, when you don't see the PACSAT-12 busy message, that you would check the state of the spacecraft. An easy way is to run PB, and use H to turn the headers on. You can then see the packet addresses, and look for QST-1, BBSTAT, LDDR etc, as detailed above.

One last comment in this area. Except for command stations while loading, there is never a good reason to keep your transmitter keyed up on AO-16. You are blocking other users who may be using the same uplink, and you are adding to the noise on the adjacent channels, especially if your deviation is too high or you are running too much power. Don't do it. This does not necessarily apply to UO-14, where the smaller number of channels and higher baud rate cause some differences. UO-14 will be the topic of a subsequent message.

SEU errors

Single Event Upsets (SEUs) are bit flips that are caused by charged particles which strike AO-16 in its unprotected position above the atmosphere. These errors show up as bits whose values change. We protect against these errors by using a software algorithm by researchers at the University of Surrey. Memory is protected in blocks of 252 bytes. Any single error can be corrected, some some multiple-bit errors can be corrected. Most multiple-bit errors, if they can't be correct, are at least detected. To avoid accumulating too many errors to be corrected, the BBS must read and correct each block on a regular basis, a process called washing. The goal is to read a block often enough to catch the block when it has just one error. Read slower, multiple errors accumulate, read more often, CPU time is wasted.

Before launch, it was estimated that, based on past performance of similar memory in similar orbits, errors would occur at a rate of 1e-7 per bit per day. At this rate, G8NOB determined that a block would need to be washed away only once every 140 days, on average, to ensure against multiple errors. Based on this, file washing was one of the things left out of the first BBS upload, as it was becoming clear that if we waited until everything was perfect we'd never get users on the BBS. We thought we could delay the file wash implementation a month or two before we had a problem. Note also that downloading a file in effect washes it, since any read will correct and re-write the file block. The only files we need worry about are files that sit for a long time without being read.

It now appears that we are getting closer to 1e-6 errors per bit per day in the AO-16 mass memory. One of the purposes of the microsat project is to gather some hard data on the real error rate of these devices, so a different than "expected" rate is not a big surprise. It does mean that we need to be washing files once every 7-14 days instead of once every 140. Now that things have become more stable, I've had a chance to look at things like error rates. Once I saw a higher than predicted base error rate, I looked for occurrences of uncorrectable errors, and indeed, I found some.

GO/K8KA has made implementation of the file wash routine the highest priority, and this feature will probably be uploaded on AO-16 next weekend. In the meantime, these errors may show up as an error message from PHS.EXE, "ERROR — body checksum error". We would be interested in reports from users on such errors. The file should have been completely downloaded, ie be a .DL file, not a .PDL file, and have a body or header checksum error. Please report any such errors to NK6K; include the file number and the day you downloaded the file.

Note that the SEU rate is not an indication of any problem, and does not mean that we expect to have damaged files as a matter of course. The wash rate will be set accordingly, and the problem will go away.

Implementation of the file wash feature is the last missing major piece for round one of the phase implementation of the PACSAT software. We've been adding BBS features since October, the majority of the work being done by GO/K8KA on UO-14, with porting to AO-16 and some minor features by KK6K. The major phases included:

basic file upload, download and simple DIR
More complex DIR
Activity logging
Multple users
Auto file delete
File wash

The Mean Time Between Failure for the AO-16 BBS is heading in the right direction; it has been 17 days since the last crash; we have reloaded twice in that time to fix bugs and add features without losing files.

73s FROM MAURIE VK5EA

ar

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

The second week in January saw the international situation change when all efforts failed to persuade Iraq to voluntarily leave Kuwait. On 17 January, American and other allied air forces commenced bombing military and strategic targets within Kuwait and Iraq. Unfortunately, I was unable to follow events leading up to this point on shortwave, as I was on vacation in Ballarat. But media reports indicated that allied forces had launched electronic counter-measures prior to the outbreak of hostilities, including jamming radar and military communications.

Upon returning to my receiving location, I noticed that some international broadcasters had dumped normal programming to concentrate on news and discussions on what was happening. For example, the BBC World Service in London has hourly news broadcasts up to 15 minutes, and programs such as "The World Today", "24 Hours" and "Newsdesk" being absorbed as continuous Gulf coverage.

The other interesting fact that I quickly noted was the absence of Iraqi external broadcasts. Initially I surmised it was because of allied bombing, but other monitors noted these went silent before the outbreak of hostilities. The only Iraqi outlets I am at present hearing are on 17940, 15600 or 11990, reportedly from Kuwait. The first two have been also reportedly carrying clandestine anti-Iraqi programs, and I have heard both on channel simultaneously, plus Iraqi jamming. Quite a mess! The amount of Iraqi jamming of external Arabic broadcasts has also decreased, whether by design or the result of allied air strikes, I cannot gauge at this juncture.

I have continued to keep an ear on Israel. The English morning news broadcast at 0500 UTC on 11605kHz has been patchy, but a few days after the Iraqi SCUD missiles started to rain down on Tel Aviv and Haifa, a relay of an Israeli network appeared on 15640kHz at 0700 UTC with an unscheduled English newscast followed by Russian programming for the Soviet emigres, who now are daily arriving in Israel. The normal relay of the Israeli commercial programming in Hebrew on 15617 and 21710kHz from 0610 UTC continues at reasonable strength here.

While the world's attention was focused on the Gulf War, tensions also increased within the USSR, following Soviet military intervention in the Baltic republics of Lithuania and Latvia. After the seizure of the radio and TV centre in Vilnius, Moscow suspended the relays of Radio Vilnius on shortwave from senders located elsewhere within the Soviet union. Vilnius reportedly was left with one HF sender plus the domestic AM senders in Kaunas.

Monitors in Scandinavia reported hearing both Baltic republics appeal for help and signal reports of their transmissions. The situation does remain tense as I am writing this. Keep an ear on both the Radio Moscow World Service and those external broadcasts from individual Soviet republics.

My copy of the 1991 World Radio TV Handbook arrived just at the same time that the Gulf War erupted. It has already proved very useful, especially with the alterations to Eastern European broadcasters. There is one puzzling discrepancy, however. Why does the frequency register at the back cut off at 21735kHz? There are broadcasters on allocations above that, including our own Radio Australia. These listings are included within the details of the respective broadcasters, but are excluded on the final register. The World Radio TV Handbook 1991 edition should be in the bookshops shortly, and is highly recommended. **ar**

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

It is now over a year since examination devolvement became a reality. Perhaps it is time to have a bit of a look at how it is going. Several organisations have run a number of examinations, so by now the worst of the teething troubles should be past.

I have not received a lot of feedback from either candidates or examiners, but from what I do hear it seems that there are still some problems to be overcome by both DoTC and the external examiners. DoTC has made changes to the examination protocols and to the instructions to the examiners rather more frequently than should have been necessary if sufficient forethought had gone into the process. Some examiners are finding that the workload is much higher than was expected, or the returns are smaller, or both.

Before devolvement was proposed, DoTC was confident that its resources could eventually cope with examinations on demand, or at least on a weekly basis at the state offices, and was working towards this ideal. The WIA's early submissions on the devolvement issue also saw this as the ideal, and we planned to enable this to happen. But this was based on the WIA being the only or the major accredited body, and a full-time paid examinations officer to do the organising.

What seems to have happened is that a number of enthusiasts have individually decided for their own reasons to become examiners. In most cases, the main reason has been a genuine desire to help candidates and to encourage new recruits into the hobby. But, with the DoTC 'free for all' policy, there has been no attempt to either limit the numbers of examiners in any areas or to ensure that all areas are served.

The number of candidates is finite, and not significantly larger than under the old system. Preparation and accreditation of a set of examination materials takes the same time however many candidates are to attend. The cost of hiring a venue is not greatly affected by the number of candidates expected. So, if we look at the economics of the system, the ideal is a few big events at a few venues.

But from the point of view of the candidate, the ideal is a small group, close to home, timed for when the individual is ready for it, with the possibility of another attempt shortly thereafter if it is needed.

Unfortunately our present social environment does not provide the number of willing volunteers needed to allow both ideals to work, to provide the quality and frequency of examinations at a minimum cost to both the candidates and the examiners.

It is to be hoped that over the next year, the devolved system will settle down, that communication between examiners and DoTC will clear up most of the current problems, and that we will end up with a system that is fair to all and 'candidate-friendly'. I see the start of 1992 as an appropriate time for the WIA and DoTC to co-operate on a full review of the devolved system.

In the meantime, I am interested in receiving comments, opinions, data and statistics from those who have been associated with devolved examinations on either 'side'. Such items will be of great value when the review is held; but do not wait until then to send them to me. I promise to file them so that I can find them when the time comes.

73, Brenda VK3KT
Federal Education Co-ordinator, WIA
ar

REPEATER LINK

WILL MCGHIE VK6UU
21 WATERLOO CRESCENT LESMURDIE 6076

Audio AGC

Repeater audio quality is one of my pet topics and I have commented on it in a previous article. There is a simple but very effective way of improving your repeater's audio quality, and that is by installing an automatic audio gain control. The most obvious change to a repeater's audio, upon the installation of audio AGC, is the reduction in audio level variations between amateur stations. Instead of audio levels varying from impossible to hear to blowing you out of the car, there will be a middle ground where audio levels are similar. It becomes easy to forget that the audio AGC is working until you compare various audios direct and through the repeater. On some signals marked differences between the direct audio and the repeated audio become obvious. A compromise on just how much compression can be used has to be found. Too much results in an unacceptable level in background noise from mobiles and heavy breathing sounds from stations running correct audio levels. Compression levels somewhere between 6 and 10dB work out best. Six decibels equates to a station running 2kHz peak deviation being increased to 4kHz deviation.

The audio AGC amplifier also enables the repeater's peak deviation to be set. If your repeater runs a clipper in the audio chain then peak deviation would already be set, but the audio AGC amplifier does a better job. Any repeater that is not running some form of deviation limiter can over-deviate, if the incoming audio signal is running excessive deviation. When set up correctly, the audio AGC amplifier results in similar audio levels between amateur stations, better sounding audio with more punch and less distortion due to excessive deviation.

In a future edition of Repeater link, I will include a simple circuit of an audio AGC amplifier. Time has caught up with me.

Sydney-Melbourne

Persistent comment about a Sydney to Melbourne repeater link has been around for over a year and little is known by Repeater Link about who, how, where and when it is all to take place. I have nothing but admiration for those planning such a large linked system. At times even keeping a single repeater on air is difficult enough, let alone several all interdependent. The word is that the system would be based around 70cm input/output to the amateur user, with the linking between the repeaters on 23cm. The use of 70cm to the amateur user is a good one, as it will be a great stimulus to the use of our 70cm band. The project should be supported by amateurs, as it could be the forerunner to other ambitious linking projects. The project may also shake up the linking regulations because, as they stand now, such a proposal does not comply with repeater linking regulations. If you know any more about this project, please let me know because the little I know may be wrong.

Since writing this article, inquiries have

resulted in an address to write. This I have done, and any information about the Sydney to Melbourne link I receive will be passed on in Repeater Link.

Deregulation

Deregulation is a much used word in amateur radio today, and it could well see improvements for the amateur. It may be that amateur radio will move in a direction that will see the Australian amateur leading the world in a few small ways. Always following the leaders will never result in any firsts. Repeater technology in Australia has always followed the leaders. We are even behind New Zealand in repeater linking. In parts of New Zealand, the amateur enjoys a linked repeater system far and above any we in Australia can boast about. Seventy-centimetre repeaters are linked together providing voice and packet operation. While this is in operation and expanding, the Australian repeater system is bogged down in regulations. Yes, we can link repeaters, but not in any innovative ways. The standard commercial method of linking two-way radios is all that the regulations allow. This method (direct linking) offers flexibility, and is the single most important way to link two repeaters together. However, it is expensive, and requires considerable hardware along with the use of extra spectrum space. If deregulation in the repeater field only means changing one regulation for another, then let the regulation change to include off-air linking. DoTC is said not to favour off-air linking, but apart from a couple of rumoured reasons why, it is still to reply to the WIA, which supports off-air linking. In VK6, we look forward to a successful resolution of a situation that has dragged on for over a year.

ar

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
FREEPOST NO 4 AG LOVEDAY RUBYVALE 4702

Nineteen-ninety saw a consolidation of the new ideas of 1989. These have proved to be worthwhile in assisting DoTC (I hope) to pinpoint the most intrusions into our bands. It also shows DoTC that we are under threat of illegal invasion by irresponsible governments which obviously have no control over their broadcast stations. There is NO valid reason why our Government should not act on our behalf.

A run-down of intrusions follows:

Broadcast mode (A3E, A3J, J3E) 851
RTTY (F1B) 1309
A1A (CW) 1401
Other (F7B, B9W, FSK, P0N, N0N) 507
Total observers in any one month 17

I have not included CB operators. The governments of these intruders are obviously powerless against the numbers, and the ease that sets are modified and/or purchased. Much as we wish otherwise, our Government cannot do any more than state our objections. Let us all be reasonable about it . . . we have NO jurisdiction over these countries . . . a couple of kilowatts might help!

The 10m band needs more use — it is going begging. This large amount of unused air space is just waiting to be used by frequency-hungry nations. All classes of amateurs should rediscover this useful band. Dare I say it? "K" calls should be given more in this area — they could use it for "packet radio communication" which should attract other classes to use it. Use it or face the threat of losing it, now that the purchase of spectrum seems to be just around the corner for VK. It is about time the Government here assisted us and recognised our worth.

UUMS, the Moscow Naval Station in Moscow, transmits for up to 24 hours each day on its various bands — all our bands, I might add. Why are they immune? VRQ, the Vietnam Press, has been observed and reported 446 times for about 24 hours. Again nothing is done to remove them, and they have a lot of "satellites" eg, PKJ, VBX, VPC — the list goes on.

I conclude hoping that 1991 will see some of these observers presently in the Special Survey continuing to some degree in the normal monitoring process.

After March, your skills are sorely needed. My thanks to you for a wonderful effort.

Owing to the weather conditions locally, mail has not been getting to my QTH in time for the summary. Cyclone "Joy" was widespread in effect. Observations received from VKs 4BG, 4AKX, BHJ, BXC, 6HQ, 6RO and 6XW.

The A3E broadcast station which has been consistently observed by VK6RO is no longer with us — what did you use, Graham? We hope this is for "keeps".

ar

December 1990 IARUMS Summary

Freq	Date	UTC	Times Logged	EMN	ID	Comments
7002.6	301290	2016	1	P0N		
7053	0612	0948	1		8NT	CQ de 8NT
14023.5	231190	0830+	16	F1B	—	RTTY 250Hz 24 hrs hrd
14048	231190	0850+	19	J3E	—	Rad Phone Indonesia?? 24 hrs
14055	241290	1030+	10	A1A	PKJ	Tlc daily hrd 10 hrs
14058/063	231190	0835+	12	AC3	—	Hellscreiber Ch 24 hrs hrd
14070	121290	1030	8	A1A	VBX	Traffic
14075+	111290	1030	38	A1A	VRQ	Viet Press
14069/91	141290	1254	2	A1A	VPC	Msgs same as VRQ
21023.5	231190	0500+	19	F1B	UMS	ID in CW USH 250Hz RTTY 18 hrs
21283	231190	1015+	29	UUMS	—	ID iN CW USR 250Hz RTTY 18 hrs
21347	231190	0900+	30	F1B	—	250Hz Txt in cypher USR
21405	261190	0400+	12	A3E	—	Com b/caster, no other info
28260	271290	2135	1	A1A	VIP04	VIP04 QSX Ch56 ET16(????)
28478/80	231190	0510+	19	F7B	—	Twinplex
28650/980/	141290	0951+		A3E	—	Com b/cast most music ch

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

Annual General Meeting

The AGM will be held on Saturday afternoon 4 May 1991 at Amateur Radio House. The closing date for agenda items and council nominations will be 2pm on Wednesday 20 March 1991, at the registered office, 109 Wigram Street, Parramatta. The annual report and meeting notice will be included as an insert to the April issue of *AR*. The report will also include the new membership card, a survey form and details about a lucky draw for a 2m handheld rig. Council nomination forms are available from the Parramatta office.

Gladesville/AUSSAT ATV Test

This had to be deferred from the end of January, when part of the link from the studio to the earth station was taken out of service for a system reconfiguration. This second test is expected to be conducted late February or early March. Details will be on various divisional broadcasts.

80th Anniversary Dinner

It is just about the end of the 80th year since the Institute was founded in Sydney in 1910. It is planned to hold a dinner in late autumn. Please contact the Parramatta office to register your interest during this month.

Storm Damage

A severe storm to parts of Sydney on the

afternoon of 21 January passed VK2WI with minor damage to the beacon antennas. The 6, 2 and 70cm arrays got to know each other better, and these systems were out of service for a few weeks, while alternative verticals were installed pending the repair of the originals. The Dural VK2RSY beacons operate on five bands from 10m to 23cm. Recently the callsign identification has had the Maidenhead locator details added.

Happenings

The March Trash and Treasure is a week earlier due to Easter, now on the 24th at Parramatta on Sunday afternoon. No details to hand when these notes were written, but watch for the annual Urunga Convention on the north coast over Easter. Stocks of the current Australian Callbook now exhausted at the Divisional Bookshop. Many books are available; send a stamped 9 x 4 addressed envelope for a list. An ATV forum at Parramatta mid-march; details on the broadcast. Any groups with an interest in establishing a 6m repeater should apply to the office for the required paperwork. Many groups have already applied. All repeater/beacon co-ordination is carried out through the Divisional office.

New Members

A warm welcome is extended to the following who joined the VK2 Division during January:

K H	Ahamer	VK2GKA	Moss Vale
R H	Ballard	VK2NWT	Bargo
P D	Cooper	Assoc	Tumbi Umbi
R	Davies	Assoc	Marayong
D R	Diss	VK2TDD	Tamworth
F	Fanti	Assoc	Croydon
G	Hinchcliff	VK2GIX	Glebe
H W	Lunney	Assoc	Epping
P	Maloney	Assoc	Junee
G G	Milton	Assoc	Kingsgrove
E	Poole	VK2JBP	Carlingford
J W	Porter	VK2NVX	Summer Hill
P J	Richens	VK2FSD	Lismore Heights
P	Rysdk	VK2MJK	Gosford East

VK3 NOTES

BARRY WILTON VK3XV

Council Nominations

Nominations for the 1991/92 WIA Victorian Division Council will close with the Secretary at 3pm on Thursday 28 March 1991, and must be in writing on a form available from the Secretary.

Nominees need also to complete the form "Consent to Act as a Director" as required by the Australian Securities Commission prior to acceptance.

New Home for Victorian Division

The dramatic decline in property value in Victoria during the past year, together with a decrease in interest earnings on our capital investments, has necessitated a reappraisal of the Division's financial position.

A number of factors, including the cost of rental premises, the desirability of proving long-term investment stability for the future, and the availability of suitable premises at a relatively low cost, have all influenced a Council decision to purchase another property.

The Divisional council has negotiated the purchase of a property similar to the one we are currently renting in Taylor Street, Ashburton.

The new premises, located in Victory Boulevard, Ashburton, are close to public transport — the railway station is about 100m away — have been purchased at a cost of $135,000, and further improvements will be undertaken at a cost of about $40,000.

We are to take possession in July and, following the expiry of our current lease in Taylor Street, will be open for business at the new premises in January 1992.

The Council is confident this investment will serve to consolidate our already sound financial position, and in the long term provide a greater degree of security for the Division. In the short term it will facilitate further expansion of membership services.

Further information will be made available at the Annual General Meeting in May this year.

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

It was with deep regret that we received the sad news of Ann McCurdy's death. I am sure that Council, and indeed anyone who had had dealings with Ann through Federal Office, would wish me to express our sincere sympathies to her family, friends and colleagues in the office. Ann was always friendly and helpful and it was always a pleasure to contact her. It certainly won't be easy to find a replacement for her.

Broadcast Officer

At the time of writing we STILL do not have a Broadcast Officer. Members of Council are taking it in turns at present to do the broadcast, but this is not a very satisfactory arrangement, particularly when you realise that most of them are already doing two or more jobs! (not to mention earning a living in their spare time!). Surely there is someone out there with a couple of hours a week to spare. Don't worry that you might not be technically competent or have the right equipment, advice and the equipment will both be supplied. Perhaps your YL has a pleasant speaking voice and you could work the control. Bevin VK5TV and Barbara Boden worked as a team for years and, as far as I know, Bonnie and Bud Pounsett are still doing the VK4 broadcast this way. Please give it some serious thought.

Council Nominations

By now you will have received forms for Council nominations please give this some serious thought also. Council could use some 'new blood' and, again, the more people they get, the less everyone has to do. If the nomination date has passed, or you've thrown the form away, let a member of Council know if you have had second thoughts, I know they'll squeeze you in somehow!

Diary Dates

Sun 24 March	Barossa Picnic (open to all) Mt Pleasant Oval
Tue 26 March	WIA General Meeting 7.45pm.

President Rowland VK5OU presents Hon Life Membership certificates to Bill VK5AWM and Jenny VK5ANW

VK6 NOTES

JOHN HOWLETT VK6ATA

Notice of AGM

It is hereby notified that the Annual General Meeting of the Western Australian Division of the Wireless Institute of Australia will be held on 17 April 1991 following the General Meeting which commences at 8pm. The meeting will be held at the Westrail Centre, East Perth.

Agenda

1. Consideration of the Council's Annual Report.
2. Consideration of the Financial Report
3. Consideration of other Reports
4. Election of Office Bearers, viz President and Vice-President of the Division and seven other Councillors
5. Election of two Auditors
6. Appointment of a Patron
7. General Business which has been duly notified.

Notice of motion for the AGM must be received by the Secretary not less than 42 days prior to the meeting and must be signed by at least three members.

Nomination of a candidate for election to Council must be received by the Secretary in writing not less than 42 days prior to the meeting, with an intimation that such candidates are willing to act. A candidate may submit statement not exceeding 200 words outlining his or her case for election, and experience. Each nomination shall be signed by two members proposing the candidate. Candidates must possess a current amateur licence.

Proxies

Any financial member entitled to vote may appoint a proxy, who must also be a financial member entitled to vote, to speak and vote on his/her behalf. Each such proxy must be in the hands of the Secretary prior to the meeting and be in the following form:

I ..... 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 meeting of the Institute held on

Signed .....

Witness .....

Date ..... ar

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr Cec Crowe	VK2CEC
Mr A J van der Kolk	VK2KKD
Joe Baker	VK2BJX

Joe Baker VK2BJX

Joe died on 24/12/90 in the Alfred Hospital, Melbourne, aged 73. He had not been ill very long, having broken a leg in an accident, but complications were found which necessitated his transfer to Melbourne from Mildura.

Joe was well known to all Sunraysia amateurs and, indeed, to many others, especially those who frequented 80m in the late evenings. Joe was fist licensed in 1978 as VK2NIM, gaining his full call VK2BJX in 1980. Many readers of *AR* will remember his column "Listening Around" which appeared for several years.

His first radio experience came when he joined the Army Signals in 1939, subsequently also serving as a war correspondent. After moving from Sydney to Mildura in the 1950s, Joe became a radio apprentice with a local firm, later branching out on his own as a radio/TV repairman.

Joe was a quiet, unassuming gentleman who will be missed by all those who knew him, both on the amateur bands, and also on the 3UZ talk-back program in Melbourne, where he was a regular caller. Vale Joe.

MARILYN SYME VK3DMS

Cec Crowe VK2CEC

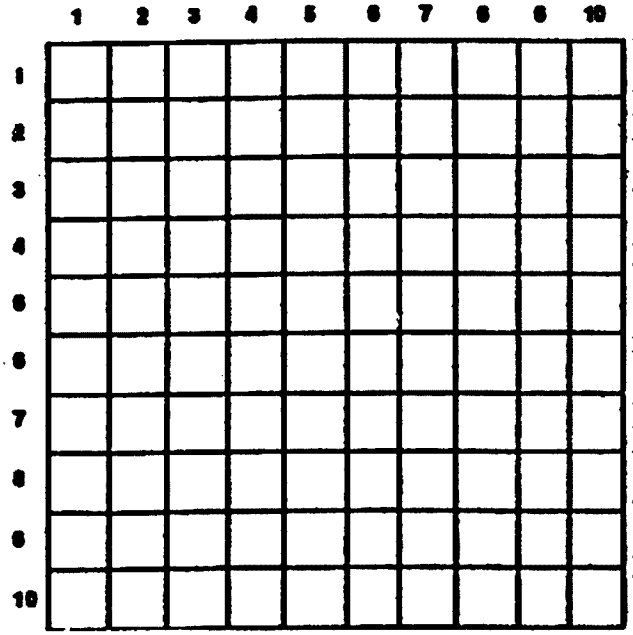
I sadly report that Cecil passed away on 15 November 1990. His untimely death at age 56 was as a consequence of a cerebral haemorrhage. He was an active amateur, operating on HF and VHF from his home in Grafton where he lived all his life.

Cec qualified for his first callsign, VK2BEC/T, in 1966.

After completing school he gained his apprenticeship in radio servicing. Later he worked repairing washing machines and refrigeration equipment. With the advent of television he worked solely on TV, broadcast and two-way radio repairs. He operated his own TV and communication sales and repair business from 1968 to 1980.

In 1956 he joined the State Emergency Services, resigning in 1983 as controller — Grafton.

Morseword No 48



Across

1 Scram
2 Mud
3 Careless
4 Trough
5 Russian city
6 Whole
7 Pond
8 At rest
9 Record
10 Measurements (abbr)

Down

1 Icy rain
2 False
3 Holy man
4 Dirt
5 Noah's son
6 Twelve months
7 Dog
8 Pelt
9 Bicycle
10 Sounds

Audrey Ryan © 1990

Solution Page 56

He volunteered for JOTA exercises as well as other community services activities.

Cec was a keen and skilled technician who constructed many homebrew projects. In 1971 he was proud to have won the VK2 section "A" of the RD contest.

Prior to his death he was active on a nightly HF net in which a number of mainly NSW amateurs participated.

I know that his hobby of amateur radio brought him a great deal of pleasure and was the source of many friendships.

Cec will be sadly missed by his daughter, Debbie, and sons, Brad, Scott and Thomas, together with all who knew him.

Ron W Higginbotham VK3RN

Amateurs will be sad to know of the passing of Ron Higginbotham VK3RN to the ranks of 'silent keys' on 7 January 1991, after a minor operation followed by infection and, finally, a heart failure.

Ron was born in Burnley, Victoria, and on starting work, was apprenticed to the *Richmond Chronicle* where he spent all his working life, finishing in charge of the whole works. The only time spent away from the smell of printer's ink was in 1941 when he joined the Army as a wireless mechanic, working on heavy radio gear.

Ron passed his radio exam on 15/6/38, but, for some reason, didn't take out his licence until 14/1/39.

He was a tireless worker for the WIA, and spent many hours as the editor of *AR* over a period of 10 years. Then, as the printer, he spent many more hours at the *Richmond chronicle,* producing *AR* magazine, until he retired from the editorship in 1964. But this did not end his work for the WIA.

Ron spent many hours in service to WIA, and in recognition of his continued efforts he received life membership, and the "Higginbotham Award" was established in his name. But this was not enough; he still undertook to check all additions and alterations to the callbook, after such a long period as editor of *AR,* as another way of helping the WIA.

He was also a member of the Moorabbin and District Radio Club. Again, due to his continued work, he was made a life member of that club and made a point of attending as often as possible. While being a "stirrer from way back", Ron was justly proud of receiving the "large stirrer's spoon" at the Tuesday morning group meeting at the M&DR Club.

Life had become a bit difficult, healthwise, for Ron over the past few years, being troubled with a number of illnesses which often put him into hospital. But always Ron came up smiling, with a laugh at his disabilities, also with a classic remark of his, "When you have to go, you have to go!" Well, there it is, and we have all lost a good friend with his passing.

To his XYL Helen, his daughter Joy, his son Brian, and their families and grand-families, we tender our deepest sympathy at Ron's passing.

Vale VK3RN Ron Higginbotham.

KEN PINCOTT VK3AFJ
& ED MANIFOLD VK3EM

R A C (Bob) Anderson VK3WY

Mr R A C (Bob) Anderson VK3WY died in Box Hill Hospital on 26/11/90, aged 82.

Bob's introduction to amateur radio came when he and the late Bob Cunningham, who was also a chemist, worked together at Mt Lyell Laboratory. When this was taken over by ICI, Bob continued working there, holding a responsible position in the explosives section during the war years and, subsequently, in administration, until retiring in 1970.

Although active on most amateur bands, he is best remembered for his service to amateur radio as secretary of the Victorian division for 17 years from the early 1930s to the late 1940s, having obtained his full licence callsign in 1930. On retirement as secretary he was granted Life Membership, but continued with the Amateur Advisory Committee for some years. He was also a member of RSGB and RAOTC, and was a member of the post-war Disposals Committee.

In latter years, he was active on 160m with the coffee-break net, his last QSO being just two weeks before he died. His friendliness and many talents will be long remembered by all who knew him.

Our condolences go to his son, daughter and her family.

HERB STEVENS VK3JO

Ian Morris VK3ELS

It is with deep regret that I advise passing of Ian on 15/1/91. Ian was a keen amateur, working his way up from limited (VK3TAD) to combined (VK3KAT) and then finally won the battle with CW and obtained his full call. His main interests lay in both 6m and 70cm and Ian was a member of both the WIA and the EMDRC.

To all those who knew Ian, he will be sadly missed.

DAVE NEVILLE VK3JEM
ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

Evolution of Amateur Radio

The idea of the improvement of international communications by wireless as a hobby seems now to have been largely lost. In 1934, as an English schoolboy, I made my first shortwave wireless set out of scraps, bits and pieces, and became a shortwave listener to international hams and broadcast stations. The noise of kookaburras from Radio Australia annoyed my family as the station closed down for the night.

Morse was used on the American railroads with Professor Morse's many differences from Continental CW which was used by the one-third of the world using the Roman alphabet. In those AM days, CW ham radio was used on the same frequency if things went bad on voice. Of course, everything was home-brew, and in those days the present ham radio examination was good and correct.

Semaphore and CW are still interesting communication hobbies but have nothing to do with real ham radio. Now we have SSB voice coming from black boxes, but the exams are almost unchanged.

Membership has not increased as it should have, and in my family, although I have taught them all to be enthusiastic sailors, none will have a bar of ham radio. The question is — do we need a re-think on ham radio generally?

"GEOFF" WALLACE VK4VLI
8 ORANA STREET
VICTORIA POINT 4165

Technical Content of AR

It seems there has been a change of mind at executive level. I hope you mean — *"We could use more technical articles. We tend to have more than enough general interest material"* (Jan editorial).

Also I hope the corporate managers mean the part of the often-repeated Mission Statement which reads — *"Encourages the maintenance of standards . . ."*

Which standards? Past? Present? Future?

The standard of *AR* technical content is lower than formerly; this in spite of an increase in technical literacy. If we must have technical literature standards — set a lower limit appropriate for the current technical literacy level and leave the upper level open.

Amateur organisations are vacating their traditional place among the leaders of technological development. That appears to be a response to trends engineered by vested interests to create "operator oriented" markets. Today's serious amateurs are more technically informed, and better equipped to search for new knowledge, than ever before. An organisation or publication which can't adjust to meet the new challenges and tries "market manipulation" to match its own mediocrity will fail; some have; and a good riddance.

More and better technical articles please.

Don't let self-training and technical investigation join CW on a "hit list".

LINDSAY LAWLESS VK3ANJ
BOX 112
LAKES ENTRANCE 3909

(I stand my by my January comments, Lindsay. The statement re standards is perhaps a little ambiguous but is intended to mean remaining abreast of current standards and maturing with them. Even if we had a "hit list" CW would not be on it! Ed)

Technical Content

I agree entirely with Drew Diamond, a magazine for radio amateurs has no point if it does not have a solid technical section. Advertising may pay for magazine productions, but it is subscribers that are necessary to convince people it is worthwhile putting their ads in!

Home-made equipment is not in competition with commercial gear, rather it points the way to new products and markets. Outboard additions can enhance the existing performance, especially where, by patient personal adjustment, various stages can be optimised, a 'blueprinted' set of internals!

Many test points are provided in production transceivers for test and alignment. Some of these could be panel, back or front accessible, and preferably buffered. This would make fault diagnosis easier and permit 'in case' final testing. There would then be opportunities for experimental gear to be directly compared, eg testing a new front end or aerial and front end by direction into the receiver IF channel. Access to the receiver input would permit a different aerial to be tested during reception, ie alternative polarisation, active antenna or a loop to null out a strong signal.

I was pleased to see that Drew won the Technical Award, I find his attitude to design and the resulting solutions stimulating. Pressure of work has prevented me constructing any of them but I AM MAKING 'PROGRESS' IN ABANDONING MY CURRENT FIELD OF ENDEAVOUR. I contribute a few comments of a technical nature when possible.

ROBERT R MCGREGOR VK3XZ
2 WILTSHIRE DR
SOMERVILLE 3912

Sending QSL cards

I see from the VK3 notes in January *AR* that there have been complaints from overseas re VK operators not sending QSL cards, and I wonder if my recent experience has been repeated elsewhere.

In the period 18 July to 25 September 1990 I posted 213 QSL cards to the VK2 Bureau in four packages containing, 30, 36, 75 and 82 cards respectively.

On 8 November 1990, the local postmaster returned to me seven loose cards which I had posted on 25 September. These had been found undamaged in a mailbag, six weeks after posting!

On 9 and 10 January 1991, three loose QSLs were returned from a batch posted on 28 June 1990 and 3 August 1990, and, on 11 January 1991, a further card from a batch posted on 18 July 1990.

These packets were securely sealed, but something drastic occurred to each of them in transit by Australia Post, and it has been an expensive exercise in futility. Since I have received only one batch of inward QSLs from the bureau in 1990, I do wonder if it is worth the effort to QSL at all, particularly when cards send direct to DX stations often go astray in the mail too!

DON SHAW VK2BDS/VK3PV
48 THIRTEENTH ST
WARRAGAMBA 2752

ar

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

March Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

VK EAST Covers the major part of NSW and Queensland.

VK SOUTH Covers southern-NSW, VK3, VK5 and VK7.

VK WEST Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world. To Europe, long path predictions are given in lieu of the short path, as the former is open at more reasonable hours.

The charts explained

These charts are different to those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 uV/metre (dBU). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands. The numbers in the column represent predicted field strength at each hour in decibels referred to 1 uV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 uV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvement. Where conditions warrant it, I sometimes include predictions for the bands below 14 MHz, deleting the upper bands.

Ten Metres

March being an equinoctial month, the predictions for ten metres show a slight improvement. It only takes a slight "lift" in conditions to dramatically improve conditions on this band during the March-April season, particularly on paths crossing the equator (transequatorial paths). Keep a watch on the short-term geomagnetic and propagation forecasts, which are broadcast by WWV and Radio Australia, or obtainable from the IPS recorded message service on (02) 414-8330.

Broadcasts

The VK2WI and VK3WI Sunday broadcasts carry propagation predictions; for the bands 14 MHz and above listen on the last Sunday of the month for the month ahead, and for the bands 1.8 to 10 MHz, listen on the first Sunday of the month for that month. Often, special predictions covering current or upcoming DXpeditions will be included, so keep a listen out.

VK EAST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.7	-9	13.7	-18	-8	-7	-11	-17
2	15.4	-20	11.7	-25	-14	-13	-16	-23
3	14.9	-27	11.3	-31	-17	-14	-17	-23
4	18.4	-20	13.8	...	-21	-14	-13	-16
5	25.0	-10	19.1	...	-26	-16	-10	-9
6	31.4	-4	24.5	...	-30	-17	-9	-5
7	32.6	-3	26.4	...	-30	-17	-8	-4
8	31.2	-3	25.1	...	-27	-14	-7	-3
9	29.5	-3	23.4	...	-21	-10	-4	-3
10	27.6	-1	22.0	-34	-13	-5	-2	-2
11	25.6	0	20.3	-22	-6	-1	0	-2
12	23.7	2	18.8	-9	1	3	1	-2
13	22.7	5	17.9	1	6	6	3	-3
14	21.8	9	17.2	11	12	9	4	-4
15	20.7	12	16.4	19	15	11	3	-6
16	19.5	13	15.3	21	16	10	1	-10
17	18.5	14	14.4	21	15	8	-2	-14
18	17.3	15	13.4	21	13	5	-7	-20
19	15.9	15	12.2	19	9	0	-13	-29
20	16.2	15	12.4	19	10	1	-12	-26
21	19.0	13	14.4	21	15	9	-1	-12
22	19.5	10	15.1	13	12	8	0	-9
23	17.9	4	13.8	3	4	1	-6	-15
24	20.0	0	15.5	-8	-1	-1	-4	-11

VK STH - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.8	-3	14.5	-10	-3	-3	-8	-15
2	16.0	-14	12.3	-20	-11	-11	-15	-23
3	15.2	-22	11.6	-26	-15	-14	-17	-24
4	18.9	-17	14.2	-38	-19	-13	-12	-15
5	25.9	-8	19.9	...	-25	-15	-9	-8
6	30.2	-5	25.0	...	-29	-17	-9	-6
7	30.1	-6	24.6	...	-30	-17	-9	-6
8	29.6	-6	23.9	...	-28	-16	-9	-6
9	28.4	-5	22.7	...	-24	-13	-7	-5
10	26.5	-5	20.9	...	-18	-9	-5	-5
11	24.3	-5	19.2	-30	-12	-6	-5	-6
12	21.8	-3	17.2	-17	-5	-3	-5	-9
13	19.4	-1	15.3	-6	-1	-2	-7	-15
14	17.8	3	14.0	4	3	-2	-10	-21
15	16.5	9	13.1	12	6	-2	-14	-29
16	15.5	11	12.2	13	4	-6	-20	-36
17	14.9	12	11.7	14	3	-8	-24	...
18	14.2	13	11.0	13	1	-12	-29	...
19	13.5	14	10.4	12	-2	-15	-34	...
20	12.9	14	9.8	10	-5	-19	-40	...
21	13.9	13	10.5	13	0	-13	-31	...
22	16.4	10	12.3	13	6	-2	-15	-30
23	20.9	7	16.0	11	10	7	0	-9
24	20.0	5	15.4	1	5	4	-1	-8

VK WEST - MEDITERRANEAN

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.4	4	14.9	3	5	1	-5	-14
2	16.4	-6	12.6	-10	-6	-8	-15	-25
3	15.5	-15	11.8	-19	-12	-13	-18	-28
4	19.3	-12	14.6	-29	-14	-11	-12	-16
5	26.5	-6	20.4	...	-19	-10	-6	-6
6	33.1	-2	26.2	...	-23	-12	-5	-2
7	32.9	-3	25.8	...	-25	-13	-6	-3
8	32.7	-3	26.8	...	-25	-13	-6	-3
9	32.1	-3	26.0	...	-23	-12	-5	-3
10	30.7	-3	24.6	...	-19	-9	-4	-2
11	28.8	-2	24.3	-33	-12	-5	-1	-1
12	26.8	0	21.3	-19	-4	0	1	-1
13	24.7	2	19.6	-6	3	4	2	-2
14	22.6	5	17.9	7	9	7	2	-5
15	21.4	9	16.9	17	14	10	2	-7
16	20.5	11	16.2	20	15	9	1	-9
17	19.5	12	15.5	21	15	8	-2	-14
18	18.5	12	14.5	21	13	6	-5	-18
19	17.6	13	13.7	20	12	3	-9	-22
20	16.5	13	12.8	18	9	-1	-14	-29
21	15.3	13	11.8	16	5	-5	-21	-38
22	15.9	13	12.2	17	7	-3	-17	-33
23	18.8	12	14.8	20	13	6	-5	-17
24	19.3	10	14.9	14	11	6	-2	-11

VK EAST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.1	-14	10.2	-17	-10	-11	-16	-25
2	14.7	-12	10.1	-13	-9	-11	-18	-27
3	14.6	-8	10.1	-9	-7	-10	-18	-29
4	13.7	-6	9.6	-5	-7	-12	-22	-35
5	12.8	-2	9.1	-2	-7	-15	-28	...
6	13.4	5	9.7	4	-3	-12	-26	...
7	15.7	8	11.5	10	4	-3	-15	-28
8	20.0	8	14.7	13	11	6	-1	-10
9	20.2	6	15.5	3	6	5	0	-6
10	18.9	-2	14.5	-10	-3	-3	-6	-12
11	18.0	-10	14.2	-20	-10	-8	-11	-17
12	16.8	-18	13.2	-29	-15	-12	-14	-19
13	15.7	-26	12.4	-34	-18	-15	-15	-20
14	15.0	-32	11.7	-37	-20	-16	-16	-20
15	14.3	-37	11.1	-37	-20	-16	-16	-20
16	13.6	...	10.4	-40	-23	-18	-19	-23
17	12.9	...	9.8	...	-29	-24	-25	-31
18	13.9	-40	10.5	-38	-21	-17	-17	-21
19	16.4	-29	12.9	...	-23	-17	-15	-18
20	21.1	-17	16.1	...	-25	-16	-13	-13
21	21.9	-13	15.0	...	-22	-14	-11	-11
22	19.0	-16	12.9	-35	-18	-12	-12	-15
23	17.1	-17	11.6	-28	-15	-12	-13	-18
24	15.8	-16	10.7	-22	-12	-11	-15	-22

VK STH - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.3	-19	9.9	-19	-12	-14	-20	-29
2	14.0	-15	9.7	-14	-11	-14	-22	-33
3	13.8	-11	9.7	-10	-9	-14	-24	-36
4	13.0	-8	9.3	-6	-9	-17	-29	...
5	12.2	-4	8.8	-4	-11	-20	-36	...
6	12.7	3	9.3	1	-8	-19	-35	...
7	14.7	7	10.9	7	0	-9	-23	-38
8	18.3	7	13.6	11	7	2	-7	-18
9	20.8	5	14.4	8	8	5	-1	-9
10	18.5	0	12.8	-1	1	-2	-9	-17
11	16.8	-7	11.5	-11	-6	-8	-14	-23
12	15.4	-15	10.5	-19	-12	-12	-18	-26
13	14.3	-25	10.0	-25	-15	-15	-19	-26
14	13.7	-31	9.4	-28	-17	-15	-19	-25
15	12.8	...	9.0	-35	-22	-20	-24	-31
16	12.3	...	8.7	...	-32	-30	-33	...
17	11.8	...	8.5	...	...	-38	...	...
18	12.7	...	9.3	...	-34	-31	-33	-40
19	14.9	-36	10.1	...	-23	-17	-17	-21
20	18.6	-23	13.8	...	-25	-17	-14	-16
21	20.6	-18	14.4	...	-25	-17	-13	-14
22	17.9	-21	12.5	-40	-21	-15	-14	-17
23	16.2	-22	11.2	-31	-17	-14	-15	-20
24	14.9	-22	10.3	-25	-15	-14	-18	-25

VK WEST - EUROPE L.P.

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.0	-29	9.7	-28	-18	-17	-21	-28
2	13.6	-27	9.6	-24	-17	-17	-23	-31
3	13.4	-23	9.5	-21	-15	-17	-24	-34
4	12.6	-21	9.1	-17	-15	-19	-28	-40
5	11.9	-20	8.7	-14	-15	-22	-33	...
6	12.4	-13	9.1	-10	-13	-20	-33	...
7	14.2	-6	10.6	-6	-8	-14	-25	-38
8	17.5	-1	13.1	-1	-1	-5	-13	-23
9	21.1	1	15.8	2	3	1	-4	-11
10	23.1	1	18.2	0	4	3	-1	-7
11	18.9	-3	14.6	-9	-3	-4	-8	-14
12	17.3	-11	13.4	-19	-10	-10	-13	-19
13	16.7	-18	13.2	-27	-16	-14	-17	-23
14	15.4	-27	12.1	-32	-19	-17	-19	-24
15	14.3	-34	11.3	-35	-21	-18	-19	-25
16	13.7	...	10.7	-40	-24	-21	-22	-27
17	12.9	...	10.0	...	-33	-29	-31	-37
18	12.4	...	9.5	...	-38	-34	-37	...
19	11.8	...	9.0	...	...	-40	...	...
20	12.8	...	9.6	...	-36	-32	-33	-40
21	14.9	-37	11.8	...	-24	-19	-18	-22
22	17.4	-28	12.3	...	-26	-19	-17	-19
23	15.7	-31	11.0	-40	-23	-18	-18	-22
24	14.5	-32	10.1	-33	-20	-17	-19	-25

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.2	-9	11.1	-10	-8	-12	-20	-32
2	17.9	-7	13.8	-16	-7	-7	-11	-17
3	17.5	-11	13.4	-22	-10	-9	-11	-17
4	20.3	-10	15.4	-30	-13	-9	-8	-11
5	26.3	-6	19.8	-38	-17	-9	-6	-6
6	28.0	-6	20.6	...	-18	-10	-6	-6
7	28.3	-5	20.8	...	-18	-10	-6	-5
8	28.3	-5	20.7	-38	-16	-8	-5	-5
9	26.4	-4	20.5	-31	-12	-6	-4	-5
10	24.3	-4	19.2	-23	-8	-4	-4	-7
11	21.9	-3	17.3	-16	-5	-3	-5	-10
12	19.5	-2	15.3	-9	-2	-3	-8	-15
13	17.8	0	14.1	-2	0	-3	-10	-20
14	16.6	4	13.1	5	3	-3	-13	-25
15	15.5	10	12.3	11	4	-4	-17	-32
16	14.9	12	11.7	13	4	-6	-20	-37
17	14.2	13	11.0	13	2	-9	-25	...
18	13.5	14	10.4	13	0	-12	-29	...
19	12.8	15	9.8	11	-2	-15	-34	...
20	13.8	14	9.5	13	1	-11	-28	...
21	13.0	12	9.0	9	-3	-16	-34	...
22	12.5	4	8.8	2	-7	-19	-36	...
23	12.0	-3	8.5	-3	-11	-22	-38	...
24	13.0	-9	9.3	-7	-10	-17	-30	...

VK STH - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.3	-5	9.8	-6	-8	-15	-27	...
2	17.3	-5	13.2	-8	-5	-7	-14	-23
3	16.9	-8	12.9	-14	-7	-8	-13	-21
4	19.6	-7	14.9	-21	-9	-7	-9	-14
5	25.3	-5	18.8	-29	-12	-7	-5	-7
6	26.2	-6	19.0	-33	-14	-8	-5	-7
7	26.2	-6	18.6	-33	-14	-8	-6	-7
8	25.5	-6	18.0	-32	-14	-8	-6	-8
9	24.0	-6	17.8	-26	-11	-7	-6	-9
10	22.1	-6	15.4	-21	-9	-6	-7	-12
11	19.9	-6	13.8	-15	-7	-8	-10	-17
12	17.7	-6	12.2	-10	-6	-8	-15	-24
13	16.0	-4	11.0	-4	-5	-10	-20	-33
14	14.5	0	9.9	0	-5	-14	-27	...
15	13.5	6	9.4	5	-6	-18	-35	...
16	12.9	9	8.9	6	-7	-21	...	...
17	12.0	11	8.4	4	-12	-27	...	...
18	11.6	12	8.2	4	-13	-30	...	...
19	11.2	13	8.0	2	-16	-35	...	...
20	12.1	13	8.8	6	-10	-27	...	...
21	12.3	13	8.6	7	-9	-25	...	...
22	11.9	9	8.4	3	-12	-27	...	...
23	11.4	2	8.2	-3	-15	-30	...	...
24	12.3	-4	9.0	-4	-12	-23	-40	...

VK WEST - AFRICA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.1	4	11.4	5	0	-7	-20	-34
2	17.9	1	13.5	0	1	-2	-10	-20
3	20.7	1	16.4	-6	1	1	-3	-9
4	26.8	2	20.7	-15	-2	2	3	0
5	30.6	-1	22.9	-24	-7	-1	1	1
6	30.6	-2	25.6	-29	-10	-3	0	0
7	10.5	-2	25.2	-31	-11	-4	-1	-1
8	30.3	-2	24.8	-31	-11	-4	-1	-1
9	29.7	-2	24.0	-29	-10	-3	-1	-1
10	28.5	-2	22.8	-24	-7	-2	0	-2
11	26.6	-1	22.6	-16	-3	1	1	-2
12	24.4	1	19.3	-7	2	3	0	-4
13	22.0	3	17.3	1	5	3	-1	-9
14	19.5	6	15.4	9	8	3	-5	-15
15	17.9	10	14.1	16	10	2	-9	-21
16	16.7	12	13.2	17	9	0	-13	-28
17	15.6	13	12.4	16	6	-4	-18	-35
18	15.1	14	11.8	16	5	-6	-21	-39
19	14.3	15	11.1	15	3	-9	-26	...
20	13.7	15	10.5	14	1	-12	-30	...
21	13.0	15	9.9	12	-2	-16	-35	...
22	14.1	15	10.6	14	2	-10	-28	...
23	14.9	14	11.5	16	5	-5	-20	-37
24	14.1	10	10.8	9	0	-10	-25	...

VK EAST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.6	2	24.5	-18	-2	3	5	3
2	30.1	2	23.0	-20	-3	2	4	3
3	30.6	2	25.0	-21	-3	2	5	4
4	30.6	3	25.3	-19	-3	3	5	4
5	30.3	3	24.8	-16	-1	4	6	4
6	29.8	4	24.2	-12	2	6	7	5
7	28.5	4	23.0	-4	6	8	8	4
8	27.1	6	22.9	7	12	12	9	4
9	25.8	11	20.6	27	23	19	13	5
10	24.3	11	19.3	27	23	17	10	1
11	22.9	11	18.2	27	21	15	7	-3
12	22.2	12	17.6	27	21	14	5	-6
13	21.5	12	17.1	27	20	13	3	-9
14	20.5	12	16.4	25	18	10	-1	-13
15	19.1	12	15.0	23	14	6	-7	-21
16	18.0	12	14.1	21	11	1	-13	-28
17	16.6	12	12.9	19	7	-5	-21	-39
18	15.0	12	11.6	14	0	-14	-33	...
19	14.9	12	11.5	14	0	-14	-34	...
20	15.6	12	12.0	16	3	-10	-28	...
21	18.6	7	14.7	13	8	1	-11	-24
22	25.9	4	20.1	2	8	9	6	1
23	28.3	4	22.7	-7	4	7	6	3
24	28.8	3	23.5	-13	0	4	5	3

VK STH - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.8	1	24.3	-22	-5	1	3	2
2	30.5	1	25.3	-25	-6	0	3	2
3	30.7	1	25.7	-26	-7	0	3	2
4	30.7	1	25.7	-25	-7	0	3	2
5	30.4	1	25.2	-22	-5	1	3	3
6	30.2	2	24.7	-18	-2	3	5	3
7	29.5	3	23.9	-11	2	6	6	4
8	28.1	4	22.6	0	8	9	8	4
9	26.3	9	20.9	21	20	17	11	4
10	24.3	9	19.2	24	20	15	8	-1
11	22.1	9	17.5	24	18	12	2	-8
12	20.0	10	15.8	22	14	6	-5	-18
13	18.7	10	14.8	21	12	2	-11	-26
14	17.8	10	14.1	20	9	-1	-16	-33
15	16.8	10	13.3	17	6	-6	-22	...
16	16.1	10	12.6	16	3	-10	-28	...
17	15.4	10	12.0	14	0	-14	-33	...
18	14.5	10	11.2	11	-5	-20	...	...
19	13.6	10	10.5	7	-10	-27	...	...
20	14.4	10	11.0	10	-6	-21	...	...
21	17.0	7	12.8	13	4	-6	-21	-38
22	22.0	1	16.9	0	4	2	-3	-11
23	26.4	1	20.7	-9	1	4	3	-1
24	29.0	1	23.1	-17	-2	3	4	2

VK WEST - ASIA

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.1	2	21.7	-12	0	4	3	0
2	27.7	1	22.5	-16	-2	2	3	1
3	28.3	1	23.5	-19	-3	2	3	1
4	28.6	1	21.8	-20	-4	2	3	1
5	28.9	2	24.2	-19	-3	2	4	2
6	28.8	2	23.8	-16	-1	3	4	2
7	28.6	3	23.4	-12	1	5	5	3
8	28.0	4	22.8	-5	5	8	7	4
9	26.8	6	21.6	5	11	11	8	3
10	25.3	11	21.4	26	23	18	12	4
11	23.8	11	18.9	27	22	16	8	-1
12	22.1	11	17.6	26	20	13	3	-7
13	20.5	11	16.3	25	17	9	-2	-15
14	19.6	11	15.6	24	15	6	-6	-20
15	18.9	11	15.0	22	13	3	-10	-25
16	18.0	10	14.3	21	10	0	-15	-31
17	16.9	10	13.3	18	6	-5	-22	-40
18	16.1	10	12.6	16	3	-10	-28	...
19	15.0	10	11.6	13	-2	-17	-38	...
20	13.8	10	10.6	8	-10	-27	...	...
21	14.0	10	10.8	9	-8	-25	...	...
22	16.4	8	13.0	13	2	-9	-26	...
23	21.1	1	16.3	1	4	1	-5	-14
24	25.1	2	19.8	-6	3	4	2	-3

VK EAST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.2	-2	24.7	...	-18	-9	-3	-2
2	27.9	-2	22.1	-31	-11	-4	-1	-2
3	25.6	-1	20.3	-19	-5	-1	0	-3
4	23.1	2	18.3	-7	2	2	0	-5
5	21.8	5	17.2	4	7	5	0	-7
6	20.7	8	16.4	13	12	8	0	-9
7	19.7	11	15.6	19	14	8	-1	-12
8	18.6	12	14.6	20	13	6	-4	-16
9	17.8	13	13.9	20	12	4	-7	-20
10	16.2	14	12.6	18	9	0	-14	-29
11	14.5	14	11.2	15	4	-7	-23	...
12	14.6	14	11.1	15	4	-7	-23	...
13	17.7	13	14.0	20	12	4	-8	-21
14	19.6	10	15.4	17	13	7	-1	-11
15	17.6	6	13.6	7	6	1	-7	-17
16	17.1	-2	13.3	-5	-2	-5	-12	-21
17	15.6	-11	12.0	-14	-9	-11	-17	-27
18	15.7	-17	12.0	-23	-13	-13	-17	-25
19	18.3	-16	14.5	-33	-17	-12	-13	-17
20	23.7	-10	18.3	...	-22	-13	-9	-10
21	28.3	-6	22.2	...	-26	-14	-8	-6
22	29.7	-5	22.8	...	-27	-15	-8	-5
23	29.7	-4	24.7	...	-27	-15	-7	-4
24	30.2	-3	25.0	...	-24	-12	-6	-3

VK STH - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.7	-2	23.0	...	-18	-8	-3	-2
2	29.1	0	23.1	-30	-11	-3	0	0
3	27.1	1	21.5	-17	-3	1	2	0
4	25.0	3	19.8	-5	3	5	3	-1
5	23.9	6	18.9	5	9	8	5	-1
6	22.9	9	18.1	14	14	11	5	-2
7	21.8	11	17.3	20	17	12	5	-4
8	20.3	12	15.9	21	16	10	1	-9
9	19.1	13	14.9	21	15	8	-2	-14
10	17.2	14	13.3	20	11	3	-9	-23
11	15.1	14	11.6	16	6	-5	-20	-37
12	14.8	14	11.4	16	5	-6	-22	-39
13	15.8	13	12.4	17	6	-4	-19	-35
14	15.1	8	11.8	9	1	-8	-22	-38
15	14.4	0	11.2	0	-4	-12	-25	-40
16	13.7	-11	10.5	-10	-10	-16	-26	-40
17	13.0	-20	9.9	-17	-14	-18	-27	-40
18	14.0	-24	10.5	-23	-15	-16	-22	-32
19	16.5	-21	13.0	-31	-17	-14	-16	-22
20	21.2	-14	16.2	...	-21	-14	-11	-13
21	25.7	-9	20.0	...	-25	-15	-10	-9
22	28.6	-7	22.7	...	-27	-16	-9	-7
23	29.8	-5	24.2	...	-27	-15	-8	-6
24	30.6	-4	25.4	...	-24	-13	-6	-4

VK WEST - STH PACIFIC

UTC	MUF	DBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.4	-3	24.8	...	-26	-14	-6	-3
2	28.0	-3	22.2	...	-20	-10	-4	-3
3	25.5	-3	20.2	-36	-14	-7	-3	-3
4	23.0	-2	18.2	-24	-8	-3	-2	-5
5	21.6	0	17.1	-13	-2	0	-2	-6
6	20.5	3	16.2	-4	3	2	-1	-8
7	19.5	7	15.5	6	7	5	-1	-10
8	18.5	11	14.5	14	11	6	-3	-13
9	17.8	14	13.8	19	13	6	-4	-16
10	16.3	15	12.6	19	11	2	-10	-24
11	14.6	16	11.2	17	7	-4	-18	-35
12	14.7	17	11.2	18	7	-3	-18	-35
13	17.8	16	14.1	23	15	8	-3	-16
14	17.1	12	13.5	16	10	3	-8	-21
15	16.1	6	12.8	7	4	-2	-13	-25
16	15.6	0	12.2	-2	-1	-6	-15	-26
17	15.0	-9	11.6	-11	-7	-9	-16	-27
18	14.2	-18	11.0	-18	-11	-12	-18	-27
19	13.5	-27	10.3	-23	-14	-14	-19	-27
20	14.5	-28	11.0	-29	-16	-13	-16	-22
21	17.2	-22	13.5	-39	-19	-14	-13	-16
22	22.2	-13	17.0	...	-25	-15	-11	-10
23	26.7	-8	20.9	...	-29	-17	-10	-7
24	29.5	-5	23.5	...	-30	-17	-8	-5

VK EAST - USA/CARRIBBEAN

VK STH - USA/CARRIBBEAN

VK WEST - USA/CARRIBBEAN

APOGEE ARTS

HAMADS

TRADE ADS

● AMIDON ferromagnetic cores: for all transmitter and receiver applications. Send DL-size SASE for data/price to: RJ & US Imports, Box 431 Kiama NSW 2533. (No enquiries at office please . . . 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscotts Electronics, Melb.

● AMTOR/RTTY/CW/FAX/SSTV software for PCs by G4BMK. AMTOR supports ARQ, FEQ and Listen modes, $75; RTTY 40-110 baud Baudot/ASCII, $50; CW, $50; FAX, $50; SSTV, $40. Full details from Dave Ralph, VK4ASB, 23 Darwin St, Aspley, Qld, 4034. (07) 263 3872 AH.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution shortwave weatherfax, Morse & RTTY receiving program. Needs CGA, SSBhl radio and RADFAX decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2 but suitable for Hercules, EGA & VGA cards respectively, $35. SATFAX is a NOAA, meteor and GMS weather satellite picture-receiving program. Used EGA or VGA modes. Needs EGA or VGA colour monitor and card, & WEATHER FAX PC card, & 137MHz receiver, $45. All programs are on 5.25" or 3.5" disks (state which) & documentation, add $3 postage. Only from M Delahunty, 42 Villiers St, New Farm, Qld, 4005. Ph (07) 358 2785.

FOR SALE - NSW

● PACKET RADIO: Get started with BEEPAK plus Microbee computer-in-a-book. Computer, monitor, Beepak, printer cable, software for computer and associated programs, Beepak, all with full documentation, $650. Roger Chubb VK2FGE, (067) 72 7840 QTHR.

● EIMAC 2C39A UHF triodes, new in sealed containers, $20 each posted. Goulburn Amateur Radio Society, PO Box 350. (048) 21 5036.

● TEN-TEC transceiver 509-4206 P/S 247 crystal calibrator 206-A CW filter 208 microphone 215-P, $350. Plus freight. Shure microphone 444D, $80 posted. VK2AKE QTHR. (048) 71 2113.

● BWD 539A dual-trace CRO 10MHz B/W C/W two probes, handbook, TV triggering, in original carton, $350 ono. Lloyd VK2ELB. (02) 639 7007 QTHR.

● FT200 transcvr, power supply, instruction book, box spare valves, mic, $300 ono. George VK2YT QTHR (02) 625 2602.

● KENWOOD SM220 station monitor, and BS-8 Pan display adapter. Brand new, has never been connected or turned on, packets still unopened, still boxed, $725 ono. A Walsh VK2TBW. (048) 61 2092.

● GENUINE IBM-XT computer, 20meg hard disk, 360K floppy, mono screen, with lots of software, word processing, spreadsheet, data base etc, $800. Also NEC 3550 Spinwriter, letter-quality printer, $300. All in good working order. Will assist with initial tuition if req. Will consider swap for synthesised HF xcvr. VK2KGG QTHR (02) 958 8703.

FOR SALE - VIC

● KENWOOD TS820S transceiver with VF0820 external VFO and MC50 desk microphone, $725. Mike Trickett VK3ASQ QTHR. BH (052) 78 9766, AH (052) 78 1986.

● YAESU FT-207R h/h with speaker mike mobile p/s wallcharger and soft carry-case handbook, $285 sn J020018. C-64 1541 disk-drive p/l B/W monitor, $300. Compakratt cartridge and RS232 converter for C-64, $70. VK3BIL. (03) 762 2119.

● ONE + 12V DC 5A 4+31V 3A power supply, $120. One 12V 1 amp DC battery eliminator, $15. One 24V 1.3A transformer, $25. One 240V 30rpm single-speed motor, $40. One anti-static mat & wrist straps, $20. 100 lengths aluminium tubing 4m long, 10mm O/DIA 2mm wall thickness, $8 length. Evan VK3EJV, AH (03) 438 2878.

● YAESU FT208, EC, incl batt and mic, $225. Realistic PRO31 hand-held programmable scanner, as new with box and manual, $225. (03) 782 1115. Norm VK3ZEP QTHR.

● 144 MOBILE 10W transceiver 23ch incl old ch41 to 63 incl main repeaters. Works well, w/mobile mount, mic, $70. Variac 2A 0-285V GE pattern, small area overheated, but works well, $30. VK3SZ, QTHR. (03) 560 4305.

● LINEARS Yaesu FL2100B S/No 280400 with manual, $675; Healthkit SB200 with manual, $600; spare valves extra. VK3EQO QTHR (03) 592 6236.

● TRIBAND full-sized beam Telrex (better than TH6DXX) $235. Ted VK3TG. (052) 59 3225.

● SEASIDE QTH 3BR BV home, outside shack, Nally lower, bay view, excellent UHF/VHF. QTH Ted VK3TG. (052) 59 3225.

● KENWOOD TS440S H/F transceiver with manual, $1695. Bert VK3BH. QTHR (03) 857 9438.

FOR SALE OLD

KEYER AEA MM2 2.99wpm Memorys, Trainer and Beacon facilities exc cond. Greg VK4UXX (074) 461 357 QTHR

FOR SALE - SA

● TS520 includes CW filter. FL2100B linear, both EC. Doc (086) 49 1956.

FOR SALE - WA

● OLD BOOKS — Cable and Wireless Comms of World-Brown, 2nd ed, 1930. Feedback, Crowhurst, 2nd ed, 1953. Frequency modulation, Sturley, 1950. Transistor Radio, Circuitry and Servicing, Mullard, 1962. Transistor and Crystal Diodes, Bettridge, 1954. Superhet Receiver, Witts, 1935. Radio Lab Handbook, Scroggie, 2nd ed, no date. Valve Technique, RSGB, 1948. Mullard Valve Regulator (Zenerdiode), 1966. Radio Designer's Handbook, Langford Smith, 1942. Handbook of Wireless Telegraphy, vol 1, 1938. Handbook of Wireless Technology, vol 2, 1938. Electrical and Radio Notes for Wireless Operator, Airmen, 1938. Radiotron Designer's Handbook, Langford Smith, 1944. Jones Radio Handbook, 1937. ARRL Handbook, 1935. II books in good condition and deserving a good home. Cost? Donation to WIA. Neil Penfold VK6NE QTHR (09) 409 9333.

FOR SALE - TAS

● YAESU FV707DM ext VFO, $200; FRB707 relay Box, $30; FT707 svce man, $30; Alinco EMS-1Z spkr mic, suit DJ500T, $40. Above as new. QTHR VK7AN (003) 31 7914.

WANTED- VIC

● SOCKET & DATA for COSSOR 2.5in (6cm) CRT type no 23-D. Power transformers: 240V primary, 100-0-100 up to 250-0-250 sec at 50ma & 2 filament windings of 6.3V at 1amp and 3amp CT. Bruce VK3YBW (03) 527 2661 after 6pm. QTHR.

● YAESU FRG7 com RX, must be in GC, required for the widow of a SK. Bruce Kendall VK3WL. (03) 741 7654 (H), (03) 741 1127 (B).

WANTED - WA

● INTRUDER WATCH OBSERVERS in VK6. Free tape, logs, postage & advice. Please help. Contact Graham VK4RO QTHR (09) 451 3561.

WANTED - OLD

● WANTED BY WWII signaller, books, British Army signals WWII Nalder, History of Radio in South Australia. Ross, Secret Warfare, Lorain, International Radio Tube Encyclopaedia. VK4EF, ● 97 JUBILEE TCE, BARDON, 4065. (07) 366 1803 AH please.

● KEYER AEA MM2 2.99wpm memory, trainer and beacon facilities, EC. Greg VK4UXX (074) 46 1357 QTHR.

WANTED - SA

● 6M CW Transceiver home-brew OK. QRP HF transceiver, Argonaut, Shimizu, Century 21 or similar. Doc (086) 49 1956.

Radio Amateur Helps Save Life

Need help urgently— then break into a net — someone is bound to hear your call.

That is exactly what happened when a missionary lapsed into a coma while in Sierra Leone, West Africa. Neilie Connolly EI6CB of Skibbereen in County Cork came to the rescue after receiving a desperate call for help. His actions over many hours helped save the life of Belinda Landy who had contracted cerebral malaria.

During the drama, Sierra Leone had no external phone links and authorities gave Neilie permission to handle the traffic.

After consulting with doctors on the missionary's deteriorating condition it was decided to air-lift her to the London Hospital for tropical diseases. A medical team from France made a mercy flight in an air ambulance. After reaching London her condition was stabilised within a day and she soon came out of the coma. While in the hospital recovering for a month Belinda Landy was amazed and grateful of the efforts made by Neilie EI6CB.

Sign of the Times

Thefts of cars for their radios and stereo gear in New York has seen motorists eager to advertise the fact their vehicle doesn't have such equipment installed.

Thousands of cars in New York are carrying the sign: "No radio on board". The same theft problem exists in Australia, and perhaps the sign will catch on here?

Amateur Radio Helping our Community

Stolen Equipment

Stolen from VK2TPH on 21 January 1991: One Alinco ALD24T 2m/70cm mobile rig, serial number 10107310. This radio is easily identified by noticing two antenna cables protruding from the rear panel, due to internal diplexer by-pass surgery. Would anyone who is offered this rig please contact Dapto Police on (042) 61 7144.

Stolen from VK2FLM on 23 December 1990: Yaesu transceiver FT102, serial number 3K990835, engraved number B62075. If any information, contact local police.

Prevent Pirates

Make sure you sell your transmitter to a licensed amateur

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

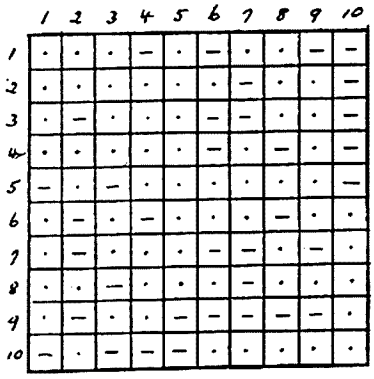
*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 48



Across: 1. Scat; 2. Silt; 3. lack; 4. sink; 5. Kiev; 6. entire; 7. lake; 8. idle; 9. log; 10. yds.

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Reflections - Transmission lines The Book - ARRL	BX348	$36.00
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Vertical Antennas - Orr	BX220	$14.27
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Operating Manual - RSGB	BX359	$25.20
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Transmitter Hunting - TAB	BX222	$32.31
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Computer Networking Con (Packet) No 9 1990 - ARRL	BX360	$21.60
Computer Networking Conf (Packet) 1-4 1982/5	BX166	$32.40
Gateway to Packet Radio 2nd edition - ARRL	BX169	$21.60
Packet Radio Made Easy - Rogers	MFJ32	$18.45
Packet Users Notebook - Rogers	BX285	$16.65
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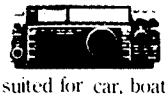

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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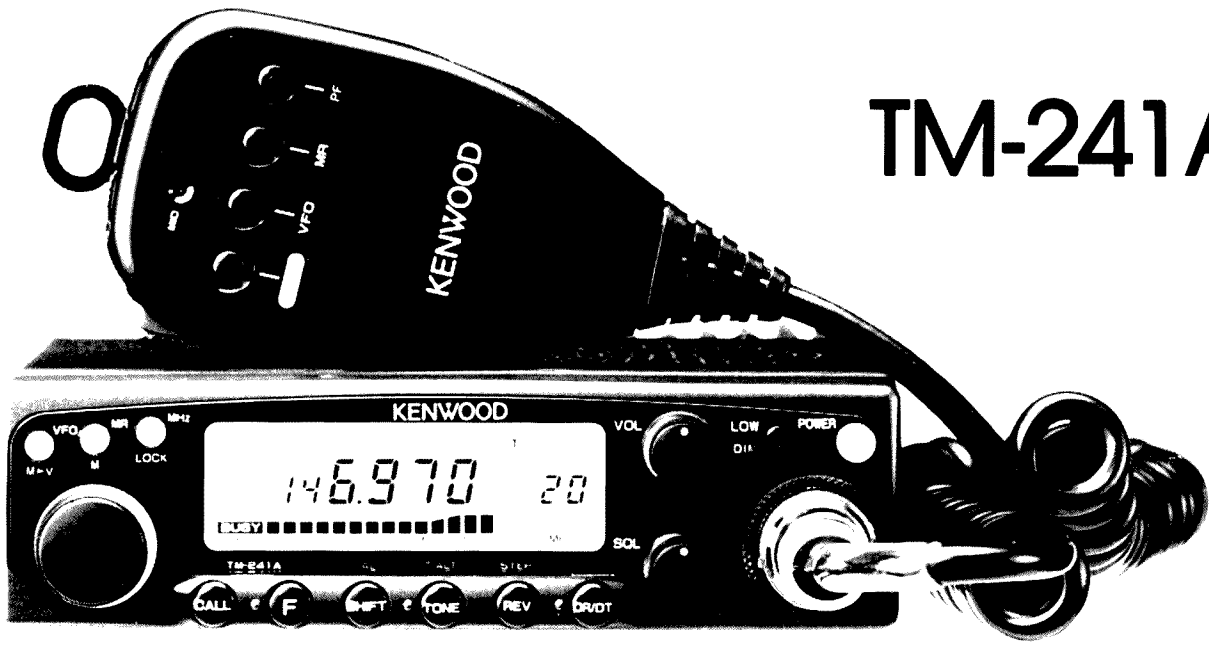

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THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

NEWS EDITOR
Jim Linton VK3PC

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
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MARKETING
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Norm Eyres VK3ZEP

ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161

Telephone: (03) 528 5962
(03) 523 8191

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Cover

This month's somewhat fanciful cover takes a whimsical look at one aspect of amateur radio. Photo by courtesy of Vicki Marsden VK2EVM.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

A Progress Report

It's that time of year again when someone (guess who?) has to write a page or two entitled "Annual Report of the Publications Committee" to be presented to the Federal Convention in April. In effect, we now have four Federal Conventions each year, but since it has the status of an Annual General Meeting, the April convention still occupies a special place in the Institute's calendar.

Members are free to visit the convention and learn more about the management of the WIA if they wish. Few do, and in view of the routine, if not actually boring, nature of the proceedings, this is entirely understandable. Along with many other reports from Federal committees and office bearers, the Publications Committee report is published in this issue of *AR*, so you don't have to be at the convention to read it. However, it refers only to the year from January to December 1990.

Since we are now a third of the way into 1991 I thought you might like an updated report, and perhaps a bit less formal. In order to write both these reports I have referred to the minutes of the monthly Publications Committee meetings, but mainly to jog the memory. Unless you were there, the minutes seldom tell the full story. To do so, they would need to be a verbatim account of everyone's remarks. We don't have the facilities or the budget of Hansard, so that's impractical.

One of the most common themes in the minutes is the supply of technical articles. Closely related is the supply of suitable colour photographs for the front cover. We are dependent for these, particularly the articles, on you, our loyal and patient members. *AR* is YOUR magazine! We prefer not to reprint overseas articles, but sometimes one may stand out by its excellence; or appropriate local articles may be in short supply, or, for various reasons, not quite ready to publish.

Sometimes it takes months to process an article from receipt to typesetter, and our team of technical editors are all busy people who can seldom work miracles! At present we have between 30 and 40 technical articles "in the mill". If yours is one of them, be patient for just a little longer! The same goes for cover pictures sometimes. The rather whimsical cover of this issue has been waiting for a couple of years to be used, and an April issue seemed appropriate.

Future planning is another recurrent theme in the minutes. In order to give you the type of articles you want, we must find out what you want, and how much of each type. Then we must ask the authors among you to write articles on this or that specific theme. A four-person sub-committee has sought this information and put it all together over the past few months, and its published guidelines are now beginning to shape our advance planning.

Every month there is a financial report by the General Manager who, over the years, has developed computer programs for detailed analysis of every aspect of WIA finances. This has permitted close control of our costs, and in fact the magazine production cost has not changed significantly for several years. The only area showing an unfavourable trend is advertising. Due to the present recession, less people have money to spend, and more dealers are "feeling the pinch". Even so, several

new advertisers have been persuaded to "give *AR* a try" over recent months.

Because of the need to restrain costs in the face of recession, we have had to reduce the number of pages (just 12 months ago). We think that the standard of our magazine is nevertheless at least as good as at any time in recent years, and all committee members remain keen to make further improvements whenever possible.

We would like more people on the committee, to replace those who cannot stay forever! As your Editor for nearly seven years, I would like to retire. One of our members was a candidate for Assistant Editor, but has now left the committee to become even more valuable as Assistant Manager of the Executive Office.

One final update. Back in February I referred to a need for a book, or a selection of books, to provide all the information a complete beginner needs to be able to pass the Novice exam. Two people responded with information about books already available. Rex Black VK2YA pointed out that at least two books which were published by the now-disbanded Youth Radio Scheme are still available from the VK2 Divisional Bookshop. From the Amateur Radio Examinations Centre, of Mandurah 6210, came a recommendation for *"The Novice Operator's Theory Handbook"* by Scott and Brucesmith, available from the authors (VK2KE and VK2AD). Nevertheless, I am sure none of their authors would disagree with a claim that these books were written many years ago and do need at least some rewriting. Who will volunteer? **ar**

WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Discussions with DoTC

The President of the WIA, Peter Gamble VK3YRP, and the General Manager, Bill Roper VK3ARZ, spent an exhaustive day in Canberra on 14th February. Meetings were held in the morning with the Manager of the Licensing Section of DoTC, and in the afternoon with the Assistant Secretary of the Radio Communications Section. Both meetings were intensive and productive. Matters of long-standing concern were addressed, as well as many items relating to the future functioning of the amateur service.

Japanese Amateur Minister of P & T

The JARL News for January 1991 announced the appointment to the position of Minister of Posts and Telecommunications of Mr Katsutsugu Sekiya, JA5FHB, a member of the Japanese House of Representatives. Mr Sekiya has been an amateur since 1970, and is one of the founding members of Diet Ham Club, JG1ZQU, which

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Tim Mills David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2ZTM VK2KFU	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Old 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Eddie Fisher Eric Fittock	VK4AOK VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Alyn Maschette John Faman Bruce Hedland - Thomas	VK6KWN VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

includes 21 members of the House of Representatives among its members.

ITU Seminar

The same JARL News gives notice of an ITU Seminar for amateur radio administrators to be held in Tokyo from 8th to 13th April 1991. The program ranges from the history of amateur radio through regulation and disaster communications to modern communications techniques. The Seminar is sponsored by ITU, the Japanese Amateur Radio League and the Japanese Ministry for Posts and Telecommunications.

Packet Operators Risk Fines

The American Radio Relay League (ARRL) reports that a number of packet radio operators have been served with violation notices by the Federal Communications Commission (FCC). This action was taken as a result of an item relayed on BBSs which was claimed to be "facilitating business issues" and to have nothing to do with amateur radio. The FCC has stated that "each BBS SYSOP is personally responsible for the "correctness" of all messages merely passing through his system". This official attitude may have repercussions among Australian amateurs.

The End of Heathkit

A recent ARRL Letter reports that the Heath company has left the kit business and will now concentrate on home-study courses, home automation equipment and assembled units.

The end of an era.

Callsigns of Deceased Amateurs

The current DoTC policy on re-issue of callsigns after the death of a holder has been to delay the re-issue for a period of two years, unless the consent of the next-of-kin of the deceased is received in writing.

The WIA strongly supports this policy, although regretting that the delay period was reduced some time ago from five to two years.

It is disturbing to learn recently of several instances where the families of a deceased amateur have been harassed shortly after the death by strangers to the family anxious to gain a particular callsign, especially if it is a two letter call.

This a most impertinent and ill-mannered intrusion into a family's private affairs.

Radio amateurs are asked to be patient and considerate in these circumstances.

More Morse

As stated last month, the WIA supports the Morse code training sessions supplied by the Divisions, and appreciates the dedication and expertise of those who provide other regular training schemes.

One of these is the service provided by Len VK3COD, who conducts a Morse code school of the air every evening, Monday to Friday, from 8.30 pm, on 147.425 MHz and 28.340 MHz. Len provides slow Morse for the first half hour, then a half hour of faster Morse. Many amateurs have found this cost free service a relatively painless and effective method of learning Morse, or of raising their speed to the examination standard.

Schedule of WIA Member Services

After some months of extensive work and discussion with Divisional representatives, Ron Henderson VK1RH was able to table a draft document at the February 9th and 10th WIA Executive meeting about the provision of member services by the WIA Federal Body or by the WIA Divisions.

It is hoped to provide an outline of this schedule as a separate news item in the future, but it has been arranged to identify the services provided by level, in order of priority, and by whether or not they involve extra charges to the members.

The intention throughout was to ensure efficient service to members and ease of access by members, without wasteful duplication of resources. The Executive meeting was pleased to adopt Ron's paper with only minor modifications.

Band Plans for 2.3 GHz and Above

The proposed band plans for these frequencies were published in the October 1990 issue of Amateur Radio magazine. As no objections or amendments had been received or proposed, it was recommended to the Federal Council meeting on 10th February 1991 that the proposed band plans for the frequencies of 2.3 GHz and above be adopted.

The motion was carried.

Working U2MIR on Packet

We have previously reported that a number of Australian amateurs are working or attempting to work the Russian Space Station U2MIR via packet.

However, from reports received, there has been a bit too much enthusiasm on the part of some amateurs, to the extent that the system has become jammed so that very few stations are connecting to U2MIR.

If U2MIR is already connected to a station, or has the PMS or digipeat function turned off, continuous connect requests, beacon and unproto texts, and digipeat tries only serve to increase congestion on the frequency and make U2MIR operation very difficult.

Please observe the frames returning from MIR and determine if a connect is possible before calling.

IARU Region III Conference

As previously noted there is to be a Region III conference in Bandoeng in October 1991. A copy of the initial agenda was received this week from Masayoshi Fujioka JM1UXU, the Secretary to the International Amateur Radio Union Region III Association.

Apart from the normal procedural and internal Association items, there will be discussion on both policy and operating matters.

Policy items listed include:-

1. Review and revision, if any, of the existing bandplans for HF, VHF and UHF
2. Use of amateur bands in Region III - HF new bands 10,18 and 24MHz; VHF, UHF and SHF
3. International Telecommunications Conferences and Events - preparation for WARCs; participation in CCIR meetings; Telecom '91 (Geneva, Oct. 91)
4. Changes to the Administration of the Radio Frequency Spectrum
5. Funding of IARU Activities
6. EMC/CISPR
7. Amateur satellite - amateur satellite usage; IARU Satellite Activity Co-ordinator
8. Promotion/Development of amateur radio
9. Formulation of call signs
10. Region 3 News.

Operating items listed include:-

1. IARU Monitoring Service - Report by Regional Co-ordinator; Review and Future activities
2. International Beacons - International Co-ordination and Co-operation; Beacons on 28 MHz, 21 MHz and 14 MHz
3. Amateur radio Direction Finding (ARDF)
4. Relaying of messages by Amateur stations
5. Contest
6. QSL Cards and QSL services - Format of QSL Cards; QSL services (Operation

of QSL Bureau)
7. Packet Radio (Regulations and Operation)

It is a long agenda. Obviously the WIA delegates will have a few very full days. If you believe that you have useful comments, information or suggestions about any of the items listed on the agenda, now is the time to be contacting your WIA Division.

Club Stations for Antarctica

A letter from DoTC Licensing confirms an agreement between the WIA and DoTC that Club station licences may be issued to facilitate amateur operations within Antarctica. Applications for such licences should be submitted in the first instance to the Hobart, Tasmania office of DoTC.

Any DX ATVers?

A letter received recently from a G4 amateur asks if there is anyone in Perth, Adelaide or Sydney who might be able to send some slow scan TV to the UK. The aim is to gain some publicity for both amateur radio and a sporting team from Bedford High School who will be playing in those cities during July 5th to 24th 1991.

The letter has been circulated to the VK2, 5 and 6 Divisions so, if you are interested, and can help, please contact the appropriate Division for further information, or write direct to Philip M. Steele, G4PMS, 107 Lower Shelton Road, Marston Moretaine, Beds, MK43 OLP ENGLAND.

Norfolk Island Special Stamp Issue

A News Release from the Norfolk Island Philatelic Bureau announces the issue of a "Ham Radio" stamp series to acknowledge the importance of amateur radio in the communications systems of Norfolk and Pitcairn Islands. There are three stamps in the series. The 43c shows a map of the Island, the $1 shows Norfolk Island in relation to Antarctica, and the $1.20 shows the Island in relation to Australia and New Zealand. In each, the background is a listing of callsigns.

The First Day Cover envelope shows a collection of QSL cards. The issue has been produced on the suggestion of Kirsti and Jim Smith of the Heard Island DX Association.

Interference to Baby Monitor

The ARRL Letter of 21st February 1991 reports on the activities of K3LR and WB3KKK in determining factors causing interference to an infant apnea monitor. The original suspicion was that a nearby amateur station was causing the monitor to emit false alarms, but investigation disproved this, indicating that the problem was mainly lack of shielding. Action is now being taken to ensure that a type approval system is arranged for future models, and that they are adequately shielded.

The assistance offered by the two amateurs has changed the attitude of the parents to amateur radio in general.

VK3 QSL Bureau

A considerable stir has been caused in international amateur radio circles by the publication, in at least two widely distributed journals, of a letter from a Victorian amateur with a grudge against the Division. The letter claimed that the VK3 Division was not processing or distributing incoming QSL cards, and that "all incoming cards are being burnt".

Several other organisations also received the letter, but checked with the WIA before publishing it and accepted the WIA's advice that the claims were totally false.

Legal action is pending where the published letter is causing damage to the VK3 Division. The following statement from the WIA, Victorian Division in response to one of the original queries makes the situation plain:-

"All amateurs are assured that the WIA Victorian Division Inwards QSL Bureau is operating efficiently within the guidelines of the IARU. The WIA Victorian Division Inwards Bureau operation is fully computerised and cards are handled and distributed by paid staff. Cards for both WIA members and non-members are accepted. Cards for members are processed and distributed as a free membership service, and cards for non-members are made available for collection without charge, or they may be distributed in the same manner as member's cards for a nominal charge.

The address for all Inwards QSL cards to the VK3 area is:-

VK3 Inwards QSL Bureau,
Box 757 G,
GPO Melbourne 3001."

JARL Ham Fair 1991

The annual Japanese Amateur Radio League (JARL) sponsored "Ham Fair" will be held at the New Hall of the Tokyo International Trade Centre at Harumi, Tokyo, from Friday 23rd August to Sunday 25th. Last year's fair attracted 59,000 visitors. This year's promises even more interest with a special commemorative station, 8J1HAM, in operation. Visitors will be welcome.

New Column in Amateur Radio

The April issue of Amateur Radio magazine introduces a new monthly column, "Knutshell Knowledge", prepared by Graham Thornton VK3IY, our Managing Editor, in his spare time!

It includes abstracts of a range of useful notes and articles from the magazines which come into the Executive office, and which may be of interest to members. Arrangements are being made for supply of copies of the articles for a small fee for the individual personal use of WIA members.

Check it out now - you may find just the item you have been seeking.

Recruitment

Statistics tabled at the February 1991 weekend meeting of Executive showed that of the 566 new members enrolled during 1990, 169 were recruited as a result of the Executive Office campaigns.

Most of these new members had requested recruitment or information packages either directly or by returning a printed slip from WIA advertisements in other magazines. This method of attracting new people to amateur radio and to membership of the WIA works but is not highly cost effective.

As has been said before, the most effective and cheapest recruiting method is by direct contact between member and non-member.

Divisional Bookshops

Members will have noticed that the WIA is now publishing a full list of books and other items available from your Division on the inner back cover of Amateur Radio magazine.

Not all items listed may be in stock at your Divisional Bookshop. However, if the item is carried by your Division, it can be ordered in with minimum delay.

Please note that Divisional Bookshop items are not available to members direct from the Executive Office.

There are some items listed, such as badges, ties and T-shirts which have been on hand a long time and have a slow turnover. Are there other items members would like made available? How about a set of WIA cufflinks, or mugs,

Continued on page 6

A Sweep Generator

To Plot the Response of IF Filters and IF Channels

LLOYD BUTLER VK5BR
18 OTTAWA AVE
PANORAMA 5041

Introduction

IN THE MODERN communications laboratory, exotic spectrum analysers are normally available to accurately plot the response of IF channels and those special crystal element filters used to shape the response of the channels. Such expensive test equipment is not often available to the average radio amateur, but if he becomes involved in assembling his own filters, or performance checking of receivers, some simpler form of test equipment might be sought. Because of this, the writer made an effort to design a simple sweep generator which could be used in conjunction with the radio shack cathode ray oscilloscope (CRO) to plot the response. The objective was to make a generator which could operate over a range of frequencies which included 455kHz and higher IF channels such as 9MHz and 10.5MHz. The task seemed simple enough if made to operate at one frequency, but a little more thought was required for the instrument to operate over a wide range of frequencies.

The finalised circuit makes use of a frequency modulated oscillator of fixed centre frequency which is heterodyned with an external variable RF signal source. This assumes that the user has some form of signal generator for general use in the radio shack. Before getting to this stage, a number of other circuit designs were made to operate. Whilst these were eventually put aside, their operation is of interest and they will be discussed before introducing the heterodyned circuit.

Basic Sweep Generator

A basic system for the sweep generator is shown in figure 1. A low-frequency sawtooth wave is generated from some form of oscillator or waveform generator. The instantaneous voltage of the sawtooth wave controls the frequency of an RF oscillator with its centre frequency set at the centre frequency of the device under test (filter or IF channel etc). Over a single sweep of frequency, RF output voltage from the device, as a function of time, is a plot of the filter response. By rectifying and RF filtering in a simple AM detector, the output is converted to a DC voltage varying as a function of time and this voltage is applied to the vertical input of the CRO. By synchronising the sweep of the CRO with the sawtooth output, the device response is plotted on the CRO screen.

The Sawtooth Generator

Various circuits could be chosen to generate the sawtooth waveform. The main requirement is that the oblique part of the wave should be as straight as possible to maintain linearity of the frequency sweep. It is also important that the sawtooth frequency be as low as possible. The reason for this is that we are frequency modulating the RF oscillator and FM sidebands are created. The greater the modulating frequency, the wider the band of side frequencies of significant level. If the significant sidebands are too wide, the resolution of detailed perturbations (bumps and kinks) in the plotted response curve is degraded. It also follows that the sidebands increase in bandwidth as the frequency deviation is increased, hence resolution is lost as sweep range is increased. For best resolution of the response plot, the sweep frequency range is set to just beyond the width of interest.

For the writer's experiments, a waveform generator type XR205 was used. The circuit detail is included later in the complete heterodyned system circuit, figure 6. A useful feature of the XR205 is that it feeds out short synchronising pulses which can be used to lock in the time base of the CRO. As an alternative, the XR205 can also accept synchronising signals so that, if desired, the CRO time base can be used as the controlling element in the system.

The sawtooth frequency was set to 33Hz. If a much lower frequency than this is used, the persistence of vision problem arises to produce a waveform flicker on the CRO trace. Even at 33Hz, this is slightly apparent but tolerable. At this low frequency, quite large coupling capacitors must be used to prevent waveform distortion and subsequent loss of frequency deviation linearity.

A Frequency Modulated Oscillator

A simple way to achieve frequency modulation of an RF oscillator is to make use of a voltage variable capacitor connected across its tuned circuit. Modulation voltage is applied to the capacitor via a circuit which blocks the RF component. The variation in shunt capacitance achievable with the voltage variable capacitor is fairly small, and initial thoughts were that, for a wide tuning range, using a large variable tuning capacitor, it might be better to use a reactance transistor stage. As a result, the circuit of figure 2 was made to operate over a tuning range

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WIA News *(continued from page 5)*

or spoons? If you think there are items you would like to be available, please let us know so that arrangements can be made.

1991 Federal Convention

The 1991 Federal Convention of the WIA will be held at the Brighton Savoy Hotel/Motel in Melbourne on the weekend of 20th and 21st April 1991.

Elsewhere in this issue of Amateur Radio magazine is published those WIA annual reports which were received at the Executive Office prior to the printing deadline (the legal closing date for receipt of reports to be included in the 1991 Federal Convention was 20th March 1991).

These reports make interesting reading.

Do you feel strongly about the WIA and the future of amateur radio as a leisure time activity? Do you want your views represented at the 1991 Annual General Meeting of the Federal WIA?

Then make sure you contact your Division or your Divisional Federal Councillor prior to the Convention so that your views can be represented. **ar**

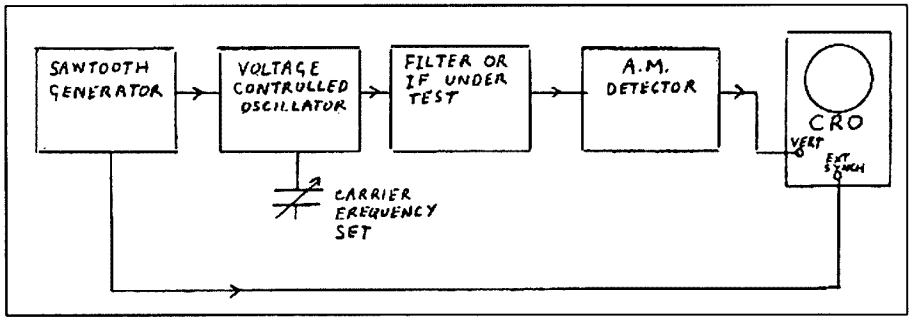

Figure 1 Sweep Generator used to plot response of IF filter or IF channel

of 400kHz to 1.3MHz. In this circuit, there is no passive tuning inductance, and the inductive reactance for Colpitts oscillator V2 is formed by reactance stage V1.

The circuit operates as follows: Resistance R1 is large compared to the capacitive reactance of C5 and hence the RF current through R1 and C5 is essentially in phase with the voltage at V1 output and oscillator tuning capacitors C9-C10. Since C5 is a capacitor, the current through it is 90 degrees out of phase with its voltage, and hence the voltage applied to the V1 transistor gate. As there is a phase reversal from input to output of the amplifier stage, the RF current through the transistor, resulting from the RF voltage on its gate, is of such a phase as to make it appear as an inductive reactance across C9 and C10. The effective inductance is controlled by the RF voltage across C5 and hence its value of capacitance. The centre frequency is thus set by the value of C5, which is used to tune over the range of 400kHz to 1.3MHz.

Over a narrower range, the inductive reactance across C9-C10 is also controlled by the V1 stage gain, which in turn can be varied by the reference voltage at its gate. By feeding the sawtooth waveform into the gate via the isolating choke L1, the oscillator V2 is frequently modulated by the sawtooth waveform.

Whilst the circuit worked well up to frequencies around 1MHz, it was not much of a success at higher frequencies, and a decision was made to frequency multiply its output for the higher frequency ranges. Frequency multiplication was originally chosen in preference to a heterodyne system because of possible problems in eliminating, particularly at the highest frequencies, the second or image frequency which would have been produced. (As it turned out in the end, the image was not really a problem at all).

The Frequency Multiplier

The frequency multiplier which was constructed is shown in figure 3. Integrated circuit N1 is a Philips LOCMOS hex inverter. Two of its gates, N1A and N1B, are used to square the waveform from the sweep oscillator. The square wave is differentiated by a third gate N1C used in a linear mode to produce positive and negative going spikes from the edges of the square wave. These spikes are used to pump a tuned circuit L1 or L2 and C4A which is set at an odd harmonic frequency of the incoming frequency. For any odd harmonic frequency, both positive and negative going spikes are in the correct phase to maintain oscillation in the circuit. This is illustrated in figure 4 for the seventh harmonic. Operation at harmonic orders as high as 13 or 15 was quite successful although, at these higher levels of multiplication, some amplitude droop occurred in the period between successive spikes. To reduce this effect, the output was coupled via a second tuned circuit L3 or L4 and C4B, which are tuned to the same frequency. For tuning, capacitors C4A and C4B are mechanically ganged.

One complication in using a multiplier is that not only the centre frequency is multiplied, but also the amount of frequency deviation, by the same multiplying factor. With all this multiplication, the sweep generator becomes fairly critical to adjust and, of course, the right harmonic must be carefully selected in tuning the multiplier.

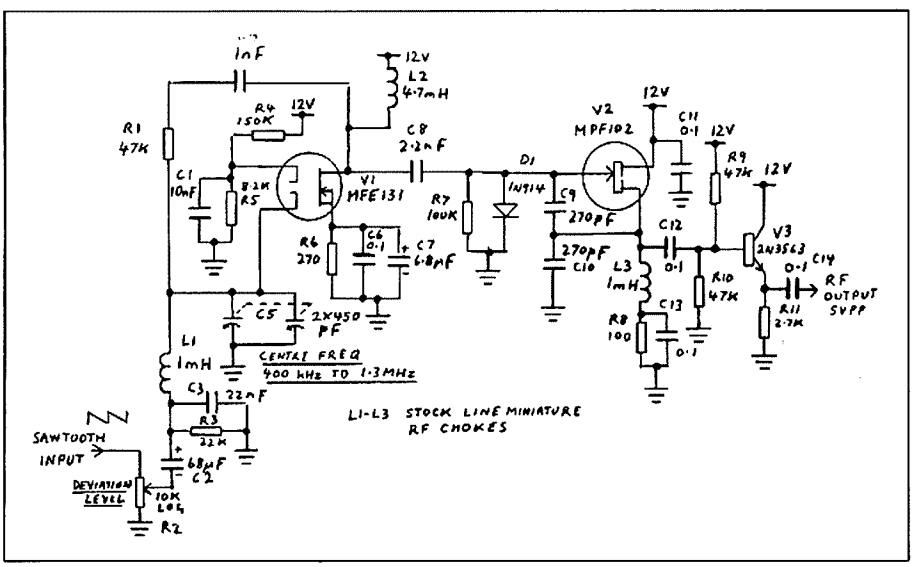

Figure 2 Frequency modulated oscillator using reactance transistor stage – tunable between 400 kHz & 1.3 MHz

The Heterodyne Sweep Generator

The tunable frequency sweep oscillator and the frequency multiplier were eventually discarded for the heterodyne system shown in the block diagram figure 5. Circuit detail of this is shown in figure 6 and its operation is described as follows:

The XR205 sawtooth generator N1 drives a voltage-controlled oscillator N2 operating at a fixed centre frequency of 1MHz. This is a very stable IC package type XR2209 which can operate at 1MHz with its frequency set by external R and C components. Its output at pin 8 is a triangular waveform and this is shaped to a sine wave by LP filter L1, C10, L2 and C11. The sweep frequency span is controlled by the amplitude of the sawtooth wave and this is set by potentiometer R8.

The 1MHz sweep output is mixed with an external variable signal source (such as a standard signal generator) in a double balanced mixer N3. This balances out the two input signals and delivers two frequencies which are the sum and difference of the input signal frequencies. The well-known MC1496 is used for this function and provides a high output level of mixed signals up to around 20MHz with output falling off as 25MHz is approached. Its low-frequency performance is limited to around 100kHz by the pri-

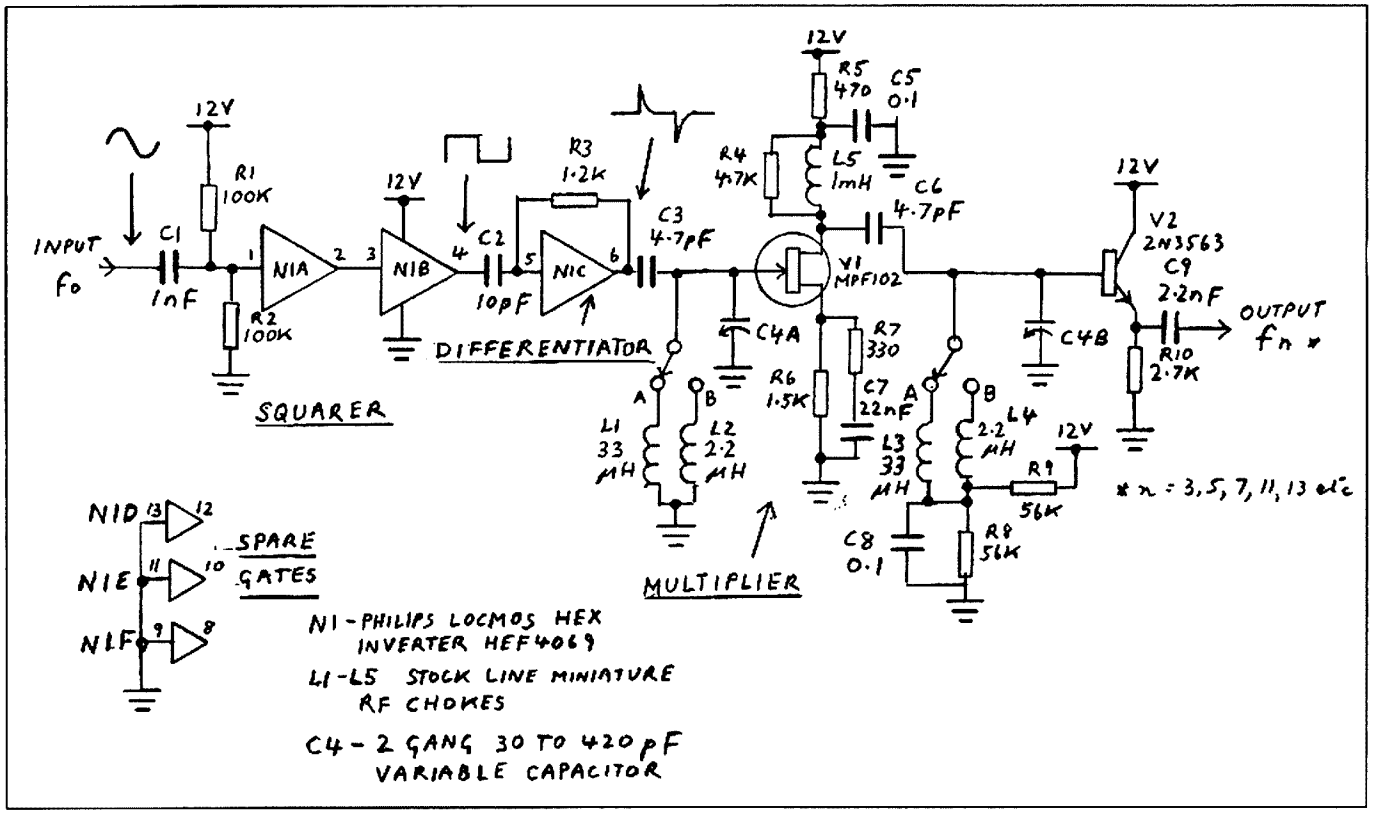

Figure 3 Frequency Multiplier

mary inductance of coupling transformer T1, wound on a small ferrite toroidal core. Output level is set by potentiometer R24 coupled via emitter follower stage V1 to provide low output impedance. For satisfactory operation, the signal level from the external signal source needs to be around 0.1 to 0.5 VPP.

To set up for a given output frequency, it is only necessary to set the external signal generator to a frequency 1MHz removed from the required frequency. No tuning is required in the sweep generator itself. Of course, there is always a second image frequency component at the output, but as the filter or IF channel being tested is itself a selective band limiting device, the image component is rejected from reaching the detector circuit. (This was something which was previously overlooked when deciding to build a multiplier in preference to heterodyning).

From an operational point of view, the precise centre frequency of the fixed internal sweep oscillator is not important. However, by setting it right at 1MHz, the frequency required from the external oscillator becomes obvious without putting pencil to paper or referring to the calculator. The precise frequency of the oscillator can be set to 1MHz by trimming the value of C7. The XR2209 is a very stable oscillator provided its supply voltage is held constant. Hence, the 12V supply to the sweep generator must be regulated.

Detector

A simple AM detector is all that is required to convert the amplitude varying RF signal to a varying DC level for the CRO vertical input. The time constant of the RF filter must be sufficient to remove the RF ripple, but short enough for it to follow the amplitude variations. If the IF channel of an AM receiver were

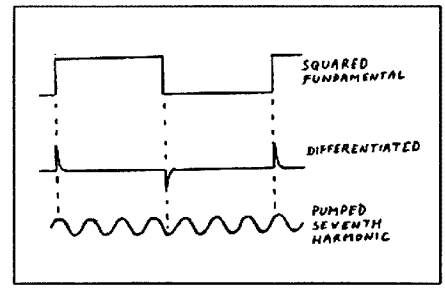

Figure 4 Differentiated pulses from square wave are correctly phased to pump odd harmonic.

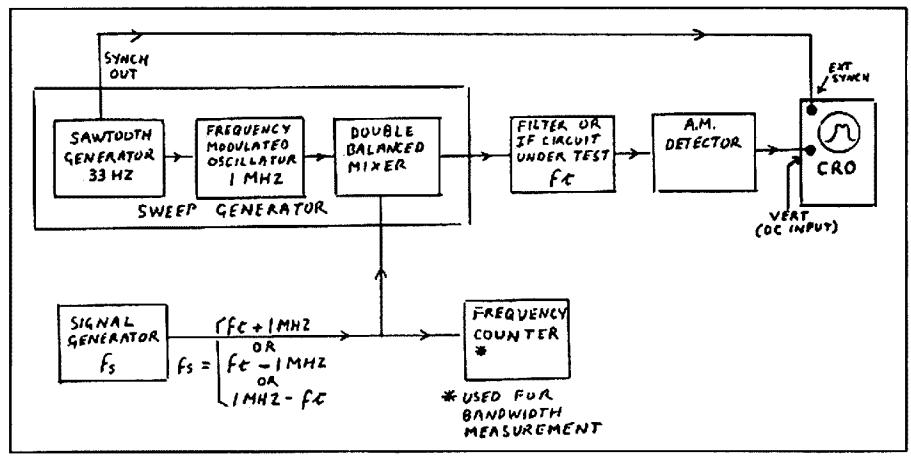

Figure 5 The heterodybe sweep generator system – sweep frequency width is independent of output frequency.

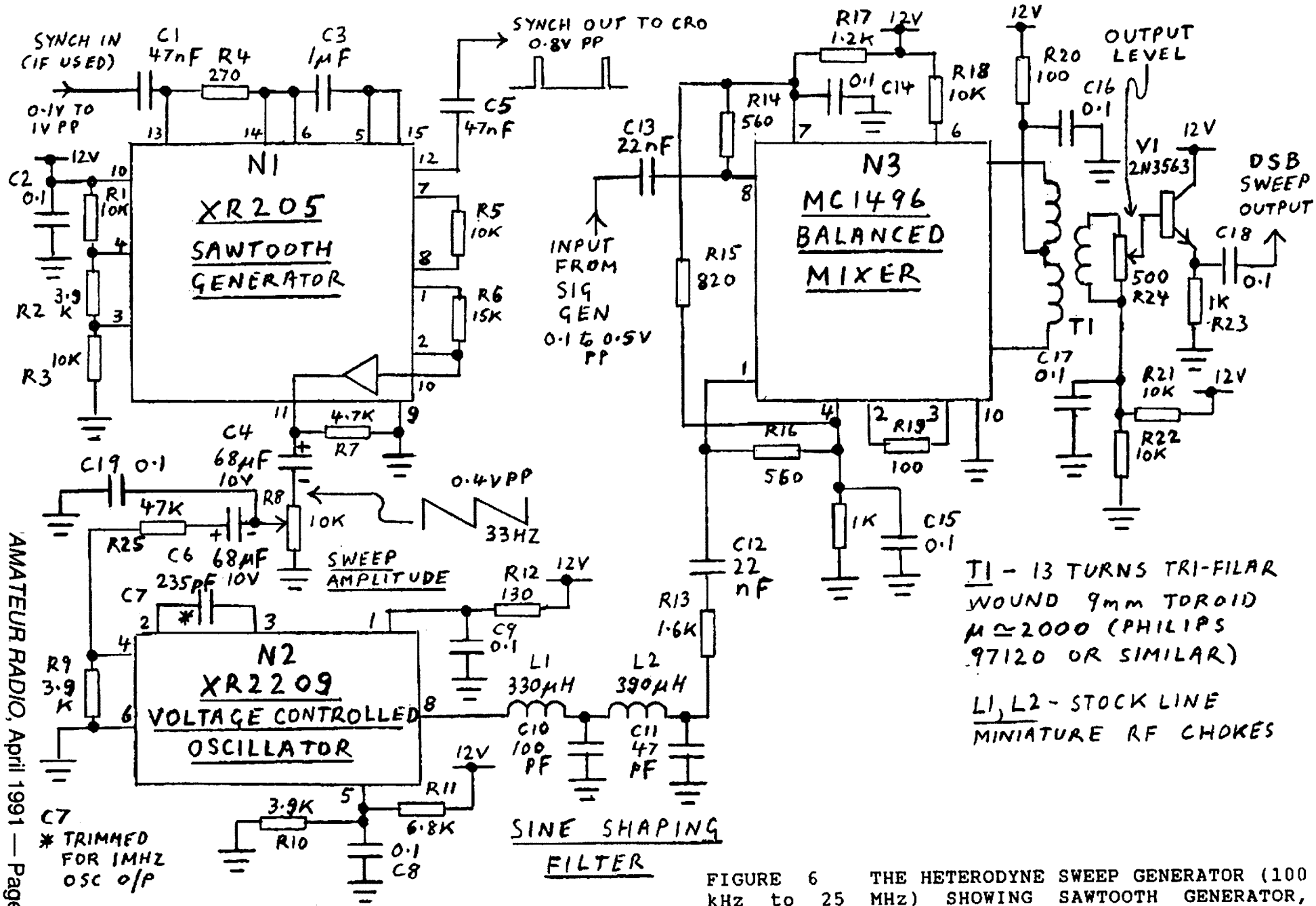

FIGURE 6 THE HETERODYNE SWEEP GENERATOR (100 kHz to 25 MHz) SHOWING SAWTOOTH GENERATOR, VOLTAGE CONTROLLED OSCILLATOR & MIXER CIRCUITS

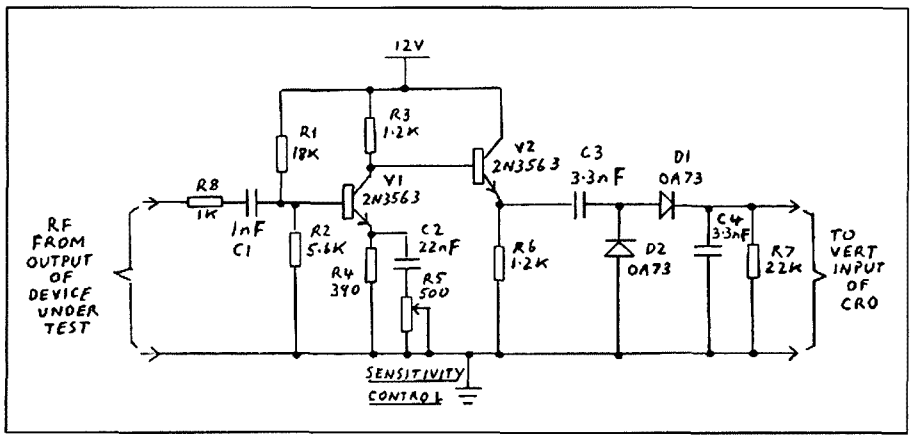

Figure 7 The detector circuit

being measured, the AM detector in the receiver would do the job nicely without any further circuitry.

Figure 7 shows the detector circuit used by the writer. Germanium diodes D1 and D2, with low forward voltage loss were used in preference to silicon diodes to reduce the zero reference error. The OA73 diodes shown were an early type used as detectors in TV receivers. The writer happened to have some of these but other germanium diodes suitable for high frequencies would also have done the job. The RF pre-amplifier V1-V2 was included to provide extra gain for measuring filters which had high insertion loss and delivered an output of inadequate level. A fairly high level into the diode detector is desirable to ensure that the zero reference error is minimal. The level must also be adequate to drive the CRO vertical deflection circuit. A gain control is provided as, on the other hand, too high a signal level input can drive the amplifier into saturation. If this happens, the plotted response curve can appear flatter at the top than it really is. If in doubt, a check can be made of the RF waveform across R6, using the CRO.

For the record, it is pointed out that the input resistance of V1 is not particularly high and if connected across high impedance circuits, it might require a further high resistance interface. Its actual input resistance depends on the setting of the gain control and is highest when the control is set for lowest gain.

The CRO

The detected output contains only AC components within the audio frequency range and hence almost any bandwidth oscilloscope is suitable provided that it has an external trigger facility. Coupling via the DC input is preferred so that a zero reference can be defined for the plotted curve. When AC coupling is used, the position of zero reference must vary with the amplitude and shape of the plotted curve. Hence, if only AC coupling is available on the oscilloscope, some interpretation is needed to establish the zero reference.

Another problem with AC coupling, which might be experienced in early types of oscilloscopes, is a restriction in low frequency response. With such a low sweep frequency used, this might cause distortion of the curve shape.

The External Signal Generator

Generally speaking, any signal generator with the required frequency range can do the job provided it is reasonably stable and free of FM noise. If there is a problem of stability, it will show up particularly at the high frequencies. If the signal source wanders in frequency, the trace will, in turn, wander across the CRO screen making it difficult to evaluate its shape and scale off its bandwidth. The writer's ageing Advance E1 signal generator (with valves) proved to be reasonably stable. At high frequencies (around 11MHz) a very slight jitter showed up in the trace. This was thought to be due to the carrier being frequency modulated by 50Hz. (Very close to the 33Hz sweep frequency).

On the other hand, the writer's Belco signal generator was unsatisfactory for the purpose at high frequencies. Using this source, it was difficult to hold the trace steady on the screen and it also introduced ripple on the top of the trace.

Had a suitable signal generator not been available, an alternative could have been to build in a stable variable frequency oscillator as part of the sweep generator unit.

Reading the Curves

In plotting the response of those filters which are made up of a number of crystal elements, some surprising bumps and kinks show up in the trace. In these

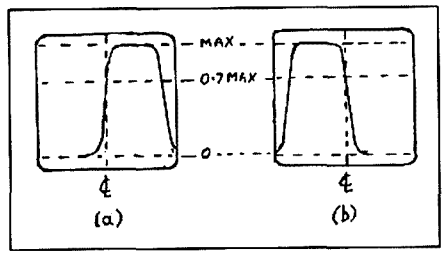

Figure 8 Measurement of Bandwidth

filters, the measured response is often quite different from the nice smooth curves shown in the glossy brochures. The perturbations as read on our equipment are even more pronounced than on the usual spectrum analyser because the vertical axis is plotted in a linear form, whereas the spectrum analyser is plotted in decibels. A typical spectrum analyser screen might plot 10dB per graticule division and hence a 3dB trough in response would be about one third of a graticule division. In the linear plot, 3dB is represented as 70 per cent of the whole trace height.

Bandwidth is defined as the range of frequencies with an amplitude within 3dB down or 0.707 of the maximum amplitude. To measure bandwidth, a simple procedure has been adopted. First adjust the trace height to say 10 graticule units. Adjust the frequency of the external signal generator so that the left-hand gradient of the curve intersects the centre graticule line at 70 per cent of the trace height or seven graticule units. (Refer figure 8a). Now accurately measure the frequency of the external signal generator with a frequency counter and record the value.

Readjust the frequency of the signal generator so that the right-hand gradient of the curve intersects the centre graticule line at 70 per cent of the trace height. (Refer figure 8b). Again measure and record the signal generator frequency using the counter. Bandwidth is calculated as the difference in frequency of the two measurements made.

Another method of measuring bandwidth is to scale off using the graticule scales. Before this method can be used, it is necessary to calibrate the sweep amplitude control (R8 in figure 6) in terms of sweep width in kHz. Once this has been done for all time, the control can be set to a reference width (say 10kHz). If the CRO graticule of 10 divisions wide, adjust the horizontal amplitude on the CRO sweep to exactly embrace 10 divisions. (Blips on the trace normally show up to mark where the sweep starts and finishes). Each graticule division is now 1kHz wide and this can be used to scale the curve width at an amplitude 70 per cent of maximum.

Calibration of the sweep amplitude control requires some patience. To measure sweep width, choose a prominent bump or kink on a typical trace and adjust this by shifting the signal generator frequency until it coincides with the start of the trace. Measure and record the frequency using the counter. Now change the frequency of the signal generator so that the reference bump or kink coincides with the finish of the trace. Again measure and record the frequency. The difference frequency between the two readings is the sweep width. Some repetition of this procedure is needed to build up data to calibrate the control.

In the writer's unit, maximum sweep width possible was 47kHz and the sweep width control was calibrated from this figure down in steps to 1kHz. In the heterodyne sweep generator, the frequency modulated oscillator has a fixed centre frequency and hence the sweep calibration holds good for whatever frequency is taken out of the mixed stage. This could not have been achieved in the type of circuit shown in figure 2. It would also be upset by multiplication as shown in figure 3.

Another measurement which can be made on the filter under test is its out-of-band rejection figure. This can be done by scaling off voltage readings on the CRO graticule. The output signal from the detector is set to a suitable level and the voltage step (V1) above zero reference, in the centre of the passband, is recorded. Maintaining the same signal level, the voltage step (V2) above zero reference, out of the passband, is also recorded. To take the second reading, it becomes necessary to step around the CRO vertical multiplier switch to resolve the lower value. In each case, the zero reference is checked by earthing the input. (Most oscilloscopes have a switch for this purpose). The out-of-band rejection in dB is equal to 20 log (V1/V2). The writer was able to measure out-of-band rejection figures as high as 55dB using this procedure. Measurements beyond this could be expected to be limited by the noise level of the measuring system.

Assembly

As the heterodyne sweep generator electronics are essentially three IC packages with associated components and the detector is essentially a few transistor and diode stages, the physical size of the unit is mainly set by the three potentiometer controls and five input and output connectors. The connector points are required for synchronisation, signal generator input, sweep RF out, detector input and output to the CRO. To house the unit, the writer made use of one of the Dick Smith Electronics small aluminium boxes. As the unit was experimental, the general components were hard wired on a piece of blank circuit board. The board suffered quite a few changes over the period of development and hence its final form was not suitable to submit as an optimised layout. This is another task which someone else might take up — perhaps on printed circuit board.

Evaluation

To check the performance of the sweep generator, it was used to plot the response of a number of filters, which had previously been evaluated using a good quality spectrum analyser. Both narrow band (3kHz) and wideband (15kHz) ceramic filters for 455kHz were checked out. The response of a 455kHz IF strip was also plotted. At the higher frequencies, quartz crystal ladder filters set at 9MHz and 11.5MHz were used. The heterodyne system operates up to 25MHz but no filters or IF strips were on hand to plot a curve above 11.5MHz. Operation between 1.5 and 25MHz is therefore assumed but not fully proven. Of course, at 25MHz, the external signal source would have to be very stable.

Summary

The finalised heterodyne sweep generator circuit makes use of three integrated circuit packages, one for sawtooth generation, one as a frequency modulated fixed carrier frequency oscillator and one to mix the modulated oscillator with an external variable signal source. The circuit as built can be used for response curve measurements in the frequency range of 100kHz to 25MHz. Sweep widths can be varied between zero and 47kHz. The circuit operates in conjunction with an external variable frequency signal generator and a cathode ray oscilloscope. For accurate bandwidth measurements, a frequency counter, or some other means of accurately measuring the signal generator frequency, is also needed. On the other hand, if the sweep width control is pre-calibrated, an estimate of bandwidth can be made using the CRO graticule scale.

The sweep generator unit, itself, is untuned, and the only tuning required is that of the external signal generator.

Assembly of crystal ladder filters for single sideband operation is often carried out by the home-constructing radio amateur. The sweep generator unit is very useful to check out the performance of these. **ar**

The Second Gladesville/AUSSAT ATV Test

The second test in the series was conducted on Wednesday evening, 27 February with WICEN as its main theme.

By the end of the night, 124 reports had been received from a wide area of Australia. Reception reports indicated a good video signal with a slight problem on the sound apparently lacking bass. With four stages of links to the Belrose earth station, a gremlin may have got in.

The WICEN content came from material prepared by NSW and Victorian WICEN in the form of seven segments. In addition, there was the regular news segments from GARC, the WIA and ANARTS, a couple of interviews and two tapes produced by NASA and made available by Tidbinbilla. The test transmission just fitted into a three-hour VHS tape.

Two regions had the misfortune to miss the live transmission. In Adelaide, the facility earmarked disappeared at short notice for a tele-conference circuit. No VK4 reports were received, and it is understood a similar lack of facilities occurred.

The 124 reports during the evening were made up as follows: 15 non-callsign holders from throughout the country. By callsign there were four from VK1, 64 from VK2, 11 from VK3, 14 from VK6 and 15 from VK7.

Will there be another test, you may ask? Maybe. Each test entails a lot of extra work to a normal weekly test transmission. Not least of all is the establishment of the required links. The studio facilities are severely shadowed in the direction of the Belrose earth station, and it requires several hops to get there. The first test made use of the nearby TAFE satellite input which had a difficult first hop. Unfortunately the TAFE has reconfigured its facility such that the feed to AUSSAT will originate on the other side of the city. The availability of links which could be left in place may determine future tests.

Tom King VK2ATJ wrote an article about the first transmission and this can be found in the March 1991 issue of *Electronics Australia*.

Thanks to the AUSSAT management and staff and to all who assisted with the second test transmission.

A copy of the first test may be obtained from the Federal video library. See Feb *AR* for details. A copy of the second test will be available shortly.

Tim VK2ZTM ar

Getting Started with Amateur Radio Satellites (Part 3)

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD
YARRAVILLE 3013

LAST MONTH WE UPGRADED our station to the stage where we could follow a satellite around the sky with a hand-steerable antenna. Perhaps you were able to hear signals from UoSat-2, our last flavour-of-the-month satellite. Next month I'll be looking at the telemetry coming down from these birds and how computers find their place in all this.

This month, however, we'll look at a communication satellite. Our flavour of the month is RS-10/11. This is probably the easiest of all the communication birds to operate. Essentially it is two separate packages, Radio Sputnik 10 and Radio Sputnik 11. They are carried piggy-back on a large commercial Russian satellite. RS-10 and RS-11 both have transponders with uplinks in in the 2m and 15m bands and downlinks in the 2m and 10m bands. The transponders operate in five different modes. RS-10 has beacons on 29.357, 145.857 and 145.903MHz. RS-11 has beacons on 29.407, 145.907 and 145.953MHz. This all sounds very complicated, but don't panic. The beacons send telemetry messages in morse code and there's only one on at a time. Most operators listen for the beacons to find out which package and which transponder is operating. I'll explain and list the transponder frequencies later. A transponder is best thought of as a wide-band repeater. It's a device that listens to a slice of one band and re-transmits it in its entirety, signals and all, on another band. In effect this means that if you transmit a signal up to the satellite, ie uplink in its listening passband, your signal will be transmitted, along with all the others in the passband on its downlink. Other stations in range of the satellites can do likewise and thereby make and maintain contact while the satellite is in range of both stations.

RS-10/11 is in an almost circular, almost polar orbit. Its orbital period is one hour, 44 minutes, 56 seconds. Its altitude is 995km, giving it a maximum access time for a high pass of 18 minutes and a maximum communication range of 6700km. This means that two stations 6700km apart could (theoretically) make very brief contact. Contacts via low orbit satellites like RS-10/11 rarely last longer than five minutes or so. Although once again (theoretically) it would be possible to make and maintain contact through RS-10/11 for a maximum of 18 minutes. Provided, of course, that both stations are very close together. The further apart they are the shorter the possible communication time.

RS-10/11 has been an excellent performer. It has provided many newcomers and old hands alike with good results using very simple gear. Remember, a lot of the goodies we take for granted are not always easily obtained in some other countries. By concentrating on such satellites in the beginning we can gradually improve our station and bring our operating technique up to scratch before tackling the more complicated birds. Which brings us to the next upgrade requirements for our satellite station.

The first transponder flown on an Oscar was on Oscar-6. This had an uplink on two metres and a downlink on 10 metres. When it was realised that the amateur satellite program was a real goer, it became apparent that there were many combinations of up and downlink frequencies. A bit of organisation was in order. Oscar-7 had a similar transponder and a second one with an uplink on 70cm and downlink on two metres. They were designated mode A and mode B. Oscar-8 had mode B and a mode J transponder. Mode J operates uplink on two metres and downlink on 70cm. It wad designated 'J' because the first one was built by Amsat-JA. RS-10/11 have transponders operating in modes A, K, T, KT and KA. As I indicated earlier they transpond between the 2m, 10m and 15m bands in various combinations.

Our simple satellite station already has listening capability on two metres. You should be able to hear the mode T and KT downlink signals. They will be on SSB or CW, not FM. FM is a no-no on all satellite transponders. So are any other continuous-mode transmissions like AM, FSK, RTTY and slow-scan TV. Although RTTY and slow scan are tolerated to a degree if the transmissions are kept to an absolute minimum time. The reason, of course, is the power availability on board the satellite and the fact that a transponder is a power sharing device. Not only do continuous modes eat up lots of power, they turn down the AGC on board leaving less available for those using less power-hungry modes. It really is a matter of being considerate to others.

If you have an HF transceiver/dipole antenna combination, and a 2m transceiver/ground plane combination, you are set up for operation on all modes on RS-10/11. It's worth a try and, after your first satellite QSO, you'll be spurred on to improve your station.

Last month I discussed simple tracking methods. This side of things can get quite complicated, and we'll go one step further next month in the discussion on computers.

For now, though, I'm going to suggest an alternative to tracking. That is to use an 'all-sky' antenna system. This simply means that we try to devise a system which is equally sensitive to signals from anywhere in the sky. That's not easy, but there are several which can do a pretty good job. Remembering that the satellites we've discussed so far are all in near polar orbits, a half-wave dipole is not a bad choice. Make sure it's up in the clear and oriented east/west so that its best sensitivity is north and south. On reasonably high passes the satellite will be in the most sensitive part of the antenna's radiation pattern during most of the pass. In general the same thing will happen on transmit. As before, make sure your 2m, 10m and 15m dipoles are properly resonant and fed correctly using your best co-ax. Remember, don't blame the satellite!

The first test of your station's transponding capability is to see if you can hear your own signals coming back. There's absolutely no point in trying to do this unless you can hear the beacon clearly. So let's begin as we did with DOVE and UoSat-2, by listening.

I'm conscious of the fact that knowing when to listen is still a big problem. Right through this series I'm assuming that you've just become interested in satellites and perhaps have only a minimum of equipment. Next month, when I take a look at the role of computers, it will be easy to know when to listen. Until then

continued on page 13

Mobile Radio Compatibility Problems in Motor Vehicles – Part One

PHIL CLARK VK1PC
57 PARTRIDGE ST
FADDEN 2904

THIS ARTICLE IS based on a talk given by Paul Bell VK1BX, to a meeting of the ACT division of the WIA.

The intention of this article is to give a general overview of some of the electrical problems that arise when installing radio equipment in motor vehicles. We are not going to try and convert you about the mounting of the antenna. We all know where the best place for that is! So, as most of us are reluctant to cut that hole in the roof, we put up with a variety of less than optimum systems including gutter mounts, boot mounts and the like. The purpose of this article is to cover the often disregarded side of the installation, the DC supply and compatibility with electrical equipment in the vehicle. Even more importantly from your point of view, to warn you of some of the possible causes of severe damage that could be done to your equipment by what appears to be a correct installation.

Because of the amount of information and material to be covered, the article is presented in two parts. The first part is a description of a typical problem involving an imaginary amateur named "Fred". The second part goes on to explain other problems that may occur, including compatibility with the other electronic systems in the modern motor vehicle.

We hear many signals on the air that have a high content of weird noises in addition to the "normal" modulation. How often have you heard signals with buzzes, pops, whines, some so pronounced that it is difficult to hear the "intelligence". These usually vary with engine speed and you can hear alternator whine or ignition buzz change pitch every time a gear changes, and the problem gets worse (or better, depending on conditions) as engine revs change. From some installations, you may hear the traffic indicators, the windscreen wipers, the radiator cooling fan (if it's electric), or even the heater fan.

So, what's happening? Let's start with a story about an imaginary amateur named "Fred". (No offence to all the Freds out there!).

Fred proudly gets his hands on his new rig. He eyes off his sparkling set of wheels, the pride and joy of the XYL! NO! There's no way he is going to punch a hole through the roof. Okay, the board of control (XYL) will grudgingly allow a small blemish in the mudguard (purely in the interest of matrimonial harmony), so in goes Fred with the hole saw. After a short bout of hackery and a few screams of tortured metal, the quarter wave stands to attention, a real work of amateur art. Now, with a little persuasion and a few screws, Fred nestles the set snugly under the dash, a real feat in some of the modern vehicles! Where is he going to connect the power leads? Obviously he wants to get the best performance from his rig, so he wants minimum power loss in the leads to his set. Hmmmm, well, the power comes from the battery, so the best place must be straight to the battery. But Fred's no fool, he decides to check with a few of his mates first, just to make sure. They all have mobile rigs so they should know what to do. "Yep," say the mates, "That's what I did and it works well." So Fred goes ahead and connects his rig to the battery, the positive lead to the positive terminal and the negative lead to the negative terminal. Fred is VERY careful to make sure that he has the connections

(continued on page 14)

Getting started with Amateur Radio Satellites (Part 3) *continued from page 12*

you'll have to ask someone who already knows. As with all circular orbit birds, once you know the time of one pass, you can calculate the next few by adding the orbital period. That's why I've taken pains to explain what the orbital period is and to give that figure for each of our flavour-of-the-month satellites.

At the appropriate time start listening carefully for the CW beacon. It won't be super strong, but it should be clearly audible. Listen on both two and 10 metres on all the beacon frequencies. Once you hear it and note the frequency you should be able to work out which downlink passband to listen in for any signals. Tune over this band as if you were tuning over the DX part of 20 metres after a weak one from afar. Try this on a few passes to get the idea of the amount of activity to expect. You may even be able to twist another local satellite operator's arm to put up a signal for you.

By now you'll be itching to try to get a signal through the transponder yourself. Once you've identified the beacon frequency that will tell you which package is operating, RS-10 or RS-11. You'll see from the frequency table that their uplink passbands are slightly different, as are their downlink passbands. Set your transmitter to a frequency near the centre of the uplink passband, say 145.880MHz in the case where RS-10 mode A is on. Set your receiver to 29.380. Give a test call on USB. Ten to 50 watts should do the trick and listen, tuning several kHz on either side of the expected downlink frequency. What a wonderful surprise to hear your signals coming back. Being received and re-transmitted by an orbiting spacecraft. Congratulations! It isn't easy to get it all together, and the fun's only just started. If you're feeling confident, why don't you call CQ? Your first contact may be easier if you line it up with another local satellite operator.

I'll give you a table now showing all the transponder frequencies. Copy it in LARGE type and pin it up over your operating position.

RS-10...		
Mode	Uplink band	Downlink band
K	21.160-21.200	29.360-29.400
T	21.160-21.200	145.860-145.900
A	145.860-145.900	29.360-29.400
KT	21.160-21.200	29.360-29.400 and 145.860-145.900
KA	21.160-21.200 and 145.860-145.900	29.360-29.400

RS-11...		
Mode	Uplink band	Downlink band
K	21.210-21.250	29.410-29.450
T	21.210-21.250	145.910-145.950
A	145.910-145.950	29.410-29.450
KT	21.210-21.250	29.410-29.450 and 145.910-145.950
KA	21.210-21.250 and 145.910-145.950	29.410-29.450

It looks complex but, if you look carefully, you'll see that there's only three passbands in different combinations. KT and KA have dual uplinks or downlinks.

Go to it and good luck. Next month we'll look at telemetry, computers and elliptical orbits, starting with Oscar-10.

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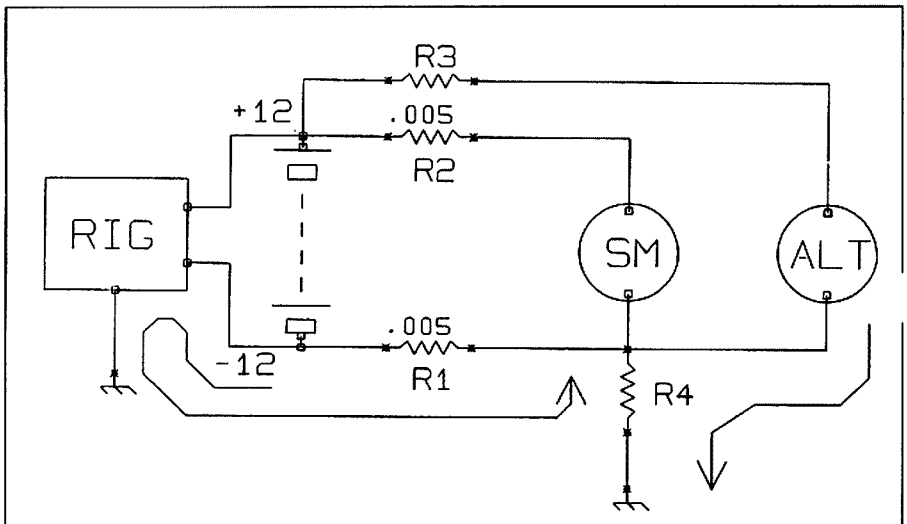

FIGURE 1.

SHARED CURRENT PATHS

the right way round; after all, he doesn't want to write off his nice new rig straight away.

The installation is complete. As a final check, Fred goes over things once more. Yes, the power connections are correct, the antenna is properly installed and has a good connection to the body of the car, and there are no other connections where they should not be. Fred is ready for the test firing.

He switches on, selects the local repeater frequency, checks his offset, listens for traffic (Fred always does the right thing), and gives a short call for a radio check. He gets a reply from one of the helpful locals saying: "5 and 9 OM, and your audio sounds great!"

Fred's head swells; he had done it and it works first go! Fred switches off and relaxes. Now the rig is there whenever he goes mobile.

The next time that Fred goes for a drive, he switches on the rig and listens around. Before long there is a CQ. Fred goes back to the call and replies to him, but the response from the other station stuns Fred. "Sorry old man, can hardly hear you. There's a fair amount of ignition noise and a lot of alternator whine on your audio."

Fred's face falls. What has he done wrong? He checked up, followed the advice and now there're problems. He goes back to his mates to find out what he might have done wrong.

"Oh yes," say the mates, "there could be a few problems. Why don't you try...?" And they start to tell poor Fred all about co-ax capacitors, changing ignition leads, ferrite chokes, bonding body panels, pi filters, relocating wiring, grounding exhaust pipes, and so on and so on. Poor Fred hardly knows where to start.

Well, time passes; the leaves fall from the trees, and the days get shorter and shorter as Fred tries cure after cure. He does have a few small successes, but the basic problem still seems to elude him. He is still left with noticeable ignition and alternator noise on his transmission.

"Okay," says Fred, throwing in the towel, "I'll put up with what's left." Then, one chilly morning as Fred talks to one of the regular locals, a minor miracle occurs. "What have you done, Fred, all of your engine noise has gone?"

Fred is surprised. He mumbles something about trying everything, and ends the contact. Fred is now puzzled; he can't think of anything that he's done recently that should have affected the radio.

The next weekend, Fred decides to tidy things up after pulling the wiring around looking for his problem. He goes to his car and turns on the rig to have a listen while he works. While he is moving the wiring, he removes the antenna connector to the rig to relocate the cable and notices that the set goes off.

"That's a bit odd," thinks Fred.

He reconnects the antenna and, sure enough, the set springs back to life. Fred looks into this phenomenon more closely and finds a blown fuse. He wonders what could cause the fuse in the negative lead to "blow".

Fred replaces the fuse with one of the same rating. On his next contact, the remark comes, "I see you've got your noise back again, Fred. What did you do?"

Fred is puzzled; he hasn't done anything! Fred does not know what the problem is, so he just lets things drift along until about a week later on another chilly morning comes the comment that the noise has disappeared again. Poor Fred! He does not know what is going on. He decides to thoroughly check the installation. As he is checking, he removes the antenna lead and notices that the set goes off! This rings bells. He has seen this before! Fred checks the fuses and, sure enough, the negative fuse is "blown". He does not have an exact replacement. "Why put a fuse in both leads?" thinks Fred

Fred thinks that it's probably just "belt and braces" policy by the maker, so he thinks that he will put in a heavier fuse; it won't do any harm. Sure enough, the next report that Fred gets tells him that his noise problem is back! This situation continues until, on another chilly morning, Fred gets a report that his noise is gone. Fred goes straight to the fuse, only to find that it's intact! What is happening this time? He removes the antenna lead, and the set goes off. Well, this is strange. Even though the noise problem has gone Fred decides he is a little worried by this development and that he should have his set looked at.

Fred takes it to the local service agent who looks inside.

"Oh dear!" says the agent, "looks like you've got an expensive job here, Fred, and it's not covered by warranty."

"What's the problem?" says Fred.

The negative tracks on the board between the negative supply lead and the rest of the set have been burnt off," says the technician. "This is usually caused by an incorrect installation."

Fred is astounded. He checked how to do it the right way first with others, and thought he had it right. What went wrong?

Fred has been a victim of KIRCHHOFF'S LAW!

"And what," I hear you say over the rustle of long-forgotten textbooks, "Is Kirchhoff's Law?"

Kirchhoff's Law says very simply that the algebraic sum of the currents into any point is zero. Whenever current is shared between more than one path, Kirchhoff's Law is applicable. This means that all of the current coming from one place has to get back there, by one path or another, to complete the circuit. To see what the effect of this is on a rig installed in a vehicle, let's have a look at the simplified diagram in figure 1. The starter motor (SM) and the alternator (ALT) are mounted directly to the engine block. The battery is mounted on the body and connected to the starter by heavy cables. These are to carry the heavy current required to start the car. Most people would wire their radio direct to the battery because they think (and even some books will tell you the same) that it's the

best place. At first glance it may seem to be the best place. Why would you not connect straight across the battery? This is where there is least resistance to the feed, and would seem to be where there is the lowest noise. But this is not necessarily so.

When the rig is installed in the car, the chassis of it may be connected to the body. Alternatively, the connection to the body may be provided through the co-ax braid and this could provide a return ground path for DC. There is, as mentioned before, a nice fat cable from the battery to the engine block (or it used to be many years ago). In modern vehicle, because of costs, weight etc, this cable is made only as large as necessary to carry the normal vehicle starting current, and no bigger! The important thing to note about this cable is that it has resistance (R1), however small. Now when the engine is started, a current of 300 to 400 amps may flow in the starting circuit. If we assume that the cable from the negative side of the battery to the engine block has a resistance of 0.005 ohms, then we can see from Ohm's Law that at 300 amps a voltage of 1.5 volts will exist across the lead. This means that the negative terminal of the battery is at a potential 1.5 volts HIGHER than the engine block. If you look at figure 1, you can see that suddenly there is an opposing voltage to the supply of the radio via the car body, of 1.5 volts. Remember that the engine block is usually connected to the body by another heavy cable. This is shown by the resistance from the starter motor and alternator to earth (R4) in figure 1.

A situation now exists where the negative connection to the radio via the power lead is at a potential of 1.5 volts greater than the "earth" connection via the antenna lead. As this is a low resistance path, perhaps even as high as .05 ohms, a simple application of Ohm's Law shows that there will be a current of 30 amps flowing! What will this current do to those small tracks on the circuit board of the radio? Whether or not current will flow in the 0 volt tracks of the board depends on the construction of the radio, but there are many where this can, and does, happen.

"But this applies only while starting the car," a voice from the rear says. True, but during that time, other problems occur. Even the best battery will "sag" in voltage when starting the car, particularly on a cold morning. In fact, this is how many commercial battery testers determine the condition of your car battery. A very good battery may only sag to 10 volts. There has been 1.5 volts lost across the wiring and this is in opposition to the voltage applied to the set, leaving a total applied voltage of 8.5 volts. But, suppose your battery sags further to say eight or even six volts? With the 1.5 volt loss across the wiring, the voltage left to supply the set during starting may be as low as 4.5 volts. What happens to those memory "keep alive" circuits that need about five volts or more? Have you lost all of the memory programming in your rig for no obvious reason?

So, now the car is started. The engine is running and the alternator is charging the battery at perhaps 40 to 50 amps. This current is also going to flow through R1 because it is the common path back to the battery. The output of an alternator is simply rectified, unfiltered DC with a high AC component, so with 50 amps flowing through R1 there will be a ripple of 0.25 volts across R1, and applied to the radio. Is it any wonder then that there will be an alternator whine on the signal?

(To be continued)

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Vintage Transceiver as a 500W Linear Amplifier

KAROL NAD VK2BQQ
GPO BOX 3209
SYDNEY 2001

VK2BQQ Teaser

Here is an interesting variation on the theme of acquiring a linear amplifier at minimum cost. One approach would be to sell your old transceiver so that you can buy a linear. VK2BQQ suggests that you actually convert your old FTDX401 or 560 into a linear amplifier.

A Valve Transceiver as a 500W Linear Amplifier

Here is an amplifier that you may have been looking for! Forget the expensive 1kW barrier and use your disposed FTDX-401 or FTDX-560 as a linear amplifier in style on five bands and at a maximum input 450W CW and 560W PEP for SSB.

So what do you do if you own a TS-830S, TS-430S etc, and want to boost your CW or SSB power, but can't buy a new linear amplifier?

You modify one — your own disposed FTDX-401 or FTDX-560 transceiver — like I did. The requirement for an SSB amplifier is a high peak current at a low anode voltage. These characteristics are available in 6KD6 tubes originally manufactured for TV industry as deflection amplifiers.

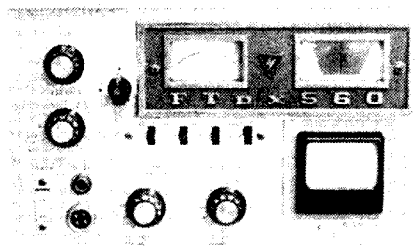
One object when starting this project was — getting the most for the least. Every attempt was made to keep the amplifier as simple and easy to modify as possible.

Amplifier Circuit

This modified linear amplifier is composed of RF input and cathode-driven finals. Grid and screen elements are at RF ground, while normal Class AB1 grid bias and screen potentials remain the same. In Class C the operating point of the finals has to be shifted with VR11 bias adjustment. Under these conditions, the power gain of the two 6KD6 is quite high and only about 30W to 45W drive is required for full output.

Mechanical Consideration

Decide early on whether you'll modify the amplifier for Class AB1 only or both. If your decision is Class AB1 only, omit



installing VR11 (bias) and Ig2 meter on the front panel. The other photographs show the interior of PA (see Fig 1). Remove C109, TC1 and a part of copper bracket. Keep only 25mm in length to hold R23 and R25.

On the rear of the chassis remove the ground screw and relocate it as seen in Figs 2 and 3 then drill and file a mounting hole for the RF input socket.

You should remove from the transceiver all the valves except the two 6KD6 finals, V209 12AT7 relay control and the voltage stabiliser V7 VR 105 MT. Remote relay — originally 8Ohm receiver output is used to interconnect a linear amplifier with a transceiver, see Fig 3 and Fig 4. On the main circuit diagram, Fig 6 shows the circuitry of remote relay in connected via an audio co-ax cable to PTT/STBY MOX switch.

Relay Circuit

The original relay RL-2 is used to bypass the amplifier during receive or when the amplifier is not required. Relay RL-2d is used for that purpose. To do so you will have to disconnect the two leads from the socket of RL-2d, pins 4 and 8, and from J5 pins 9 and 10. Carry out the wiring as per drawing indicated in Figs 5 and 9.

Input RF Circuit

The simple circuit into cathode is composed of a parallel resonant circuit. The coils are wound and assembled on the PC driver board (see photographs Figs 10 and 11). Enamel wire of 0.8 and 1.25mm has been chosen for safety purposes. You can accidentally hit the amplifier with full drive on, and there will be no fireworks or melting. The slugs are not removed but used to obtain a low SWR between the transceiver and the amplifier. Target alignment frequencies are 3.6, 7.1, 14.2, 21.2 and 29MHz. Switch S1n (originally not used) is for that purpose. Please note: you don't have to remove S1h if you can get easy access with the soldering iron down to switch S1n.

Because this is an RF project keep any PC board and co-ax shield leads short as shown in the photographs. Table 1 gives L/C value and number of turns for each band. Fig 8 shows the wiring guide between the PC board and switch S1n.

Construction

Modification of this amplifier is simple. A close-up view of part of the completed modifications is shown as a guide in Fig 11.

Note: lay the CX1 50ohm co-ax cable below the disc capacitor and relay.

The blue feed-through capacitor between the arrows of C7 and C9 is used as a support, and one end of R25, RFC1, C9 and M1 meter leads are connected to it.

Class C Operation

Higher power conversion efficiency can be produced by operating the finals well beyond cut-off so that the plate current

Figure 1 PA and PC Driver board

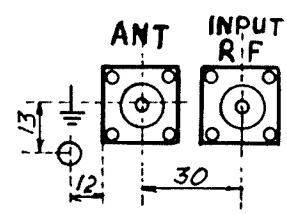


Figure 2

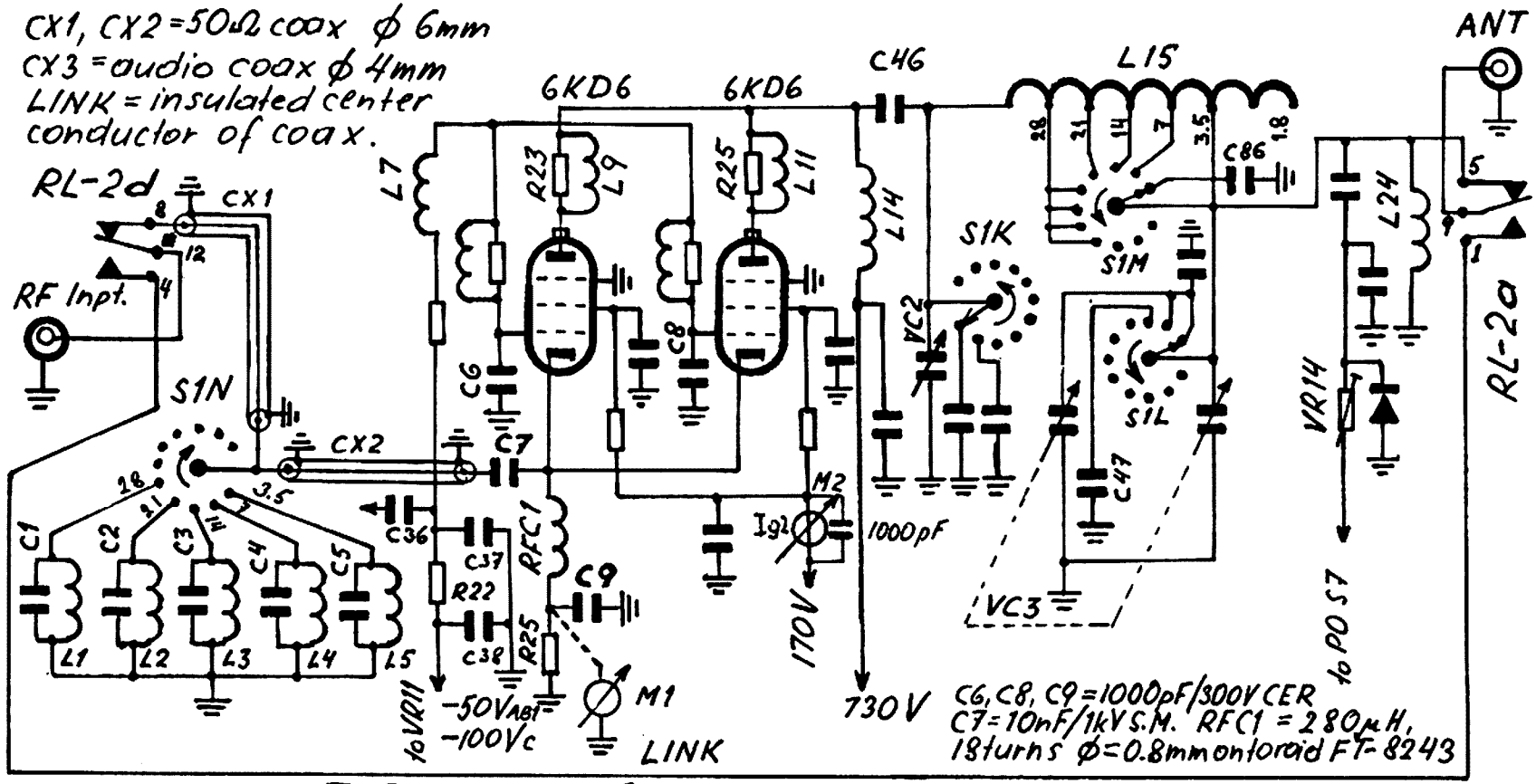


FIG. 5 FTDX401 or FTDX560 Linear Amplifier.

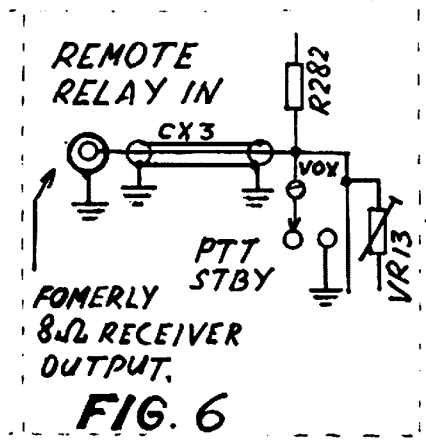


FIG. 6

	f	turns	φmm	CpF	
L1C1	28 MHz	4	1.25	100	S.M. 500V
L2C2	21 MHz	5	1.25	130	S.M. 500V
L3C3	14 MHz	6	1.25	330	S.M. 500V
L4C4	7 MHz	7	1.25	1000	S.M. 500V
L5C5	3.5 MHz	18	0.8	820	S.M. 500V

TABLE 1.

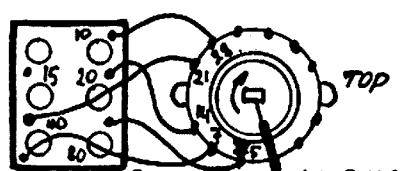


FIG. 8 PC and Switch S1N

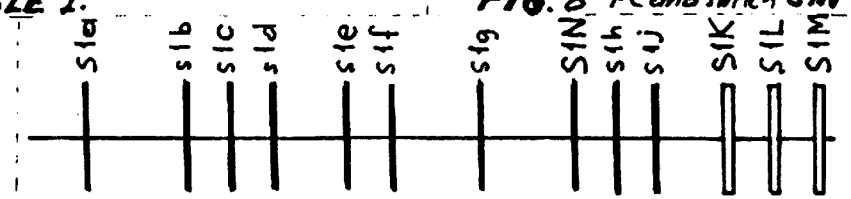


FIG. 7 LAYOUT OF S1 SWITCHES.

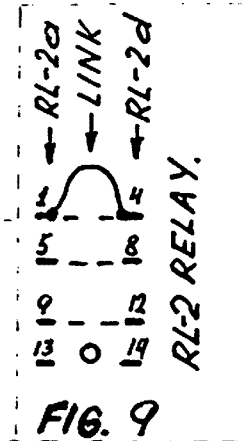
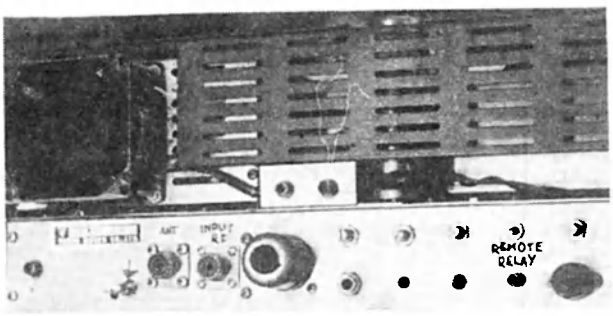


FIG. 9



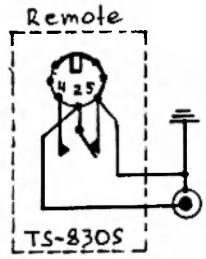


Fig.4

flows for about 130 degrees of the cycle, therefore the bias potentiometer should be turned fully anti-clockwise. To achieve this operationally I recommend relocating the bias potentiometer VR11 onto the front panel of the amplifier.

Changing the operating point from Class AB1 to Class C will change the characteristics of the loading slightly. However, the π network in the plate circuit is still capable of performing its output matching job. In the negative power supply replace R515 (5.6k or 10k) with a 1K ohm/0.5W resistor.

If the output circuit is slightly mistuned and the 6KD6 is fully driven above 700mA screen current will be excessive and the final tubes may be damaged.

To avoid this both screen and plate currents are continually monitored. Remove the old VFO assembly and install a 0-50 dc milliammeter for screen current metering.

Adjustment and Tuning

The exciter is adjusted in the usual manner as per its manual. Beginning with 29MHz connect the exciter into a 50 ohm dummy load through an SWR meter. Tune the exciter up to about 150mA of cathode current. Now turn down the CW carrier gain and make no further adjustment to the exciter except to regulate drive when necessary.

Transfer the dummy load to the linear amplifier through a second SWR or RF power meter and connect the exciter to the RF input of the linear amplifier, retaining the first SWR meter in circuit.

Switch exciter to send/transmit and M1 should read 50mA of resting cathode current, provided that the remote relay output from the exciter is connected to the remote relay in of the linear amplifier.

Now, momentarily press the Morse sending key and adjust drive to about 200mA of cathode current on the amplifier. Rotate plate for minimum (dip) meter reading and load from position 3 to maximum output indication. Now apply drive again and adjust the slug of L1 in the input network for lowest indication on the first SWR meter. Repeat process on the remaining bands.

Final Tuneup

Tune up the exciter to plate minimum dip, loading to maximum Ig2 or RF power output meter indication, keeping cathode current below 150mA.

Tuning the linear amplifier is similar to any conventional plate/load circuit except that setting the load capacitance is much more critical in Class C. Gradually increase drive, plate for dip and load for maximum RF output. However, in Class C, turn down VR11 to minimum and keep Ig2 indication at 35mA by detuning the load one stop onwards. Table 2 shows a set of operating parameters as measured.

Summary

This amplifier has proved itself to be a good performer on all bands and withstood 28 hours of continual operation during the 1989 WPX CW Contest. Overall efficiency in Class AB1 is 64 per cent, and in Class C is 75 per cent. All it takes to prove this would be your decision to try the idea yourself!

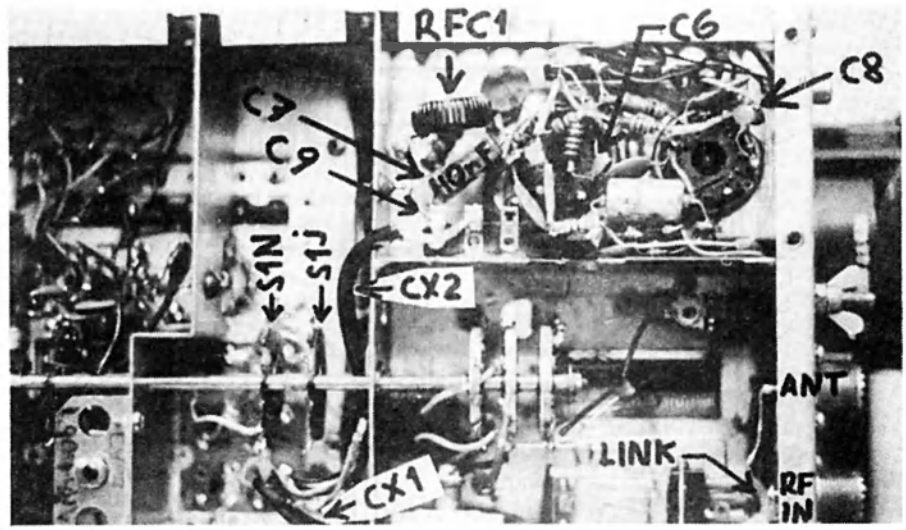


Figure 11. Under chassis view of the Linear Amplifier

Band	Wrf	out	Ic	mA	Ig2	mA	Va		Ic driver mA	
	AB1	C	AB1	C	AB1	C	B1	C	QB1	C
10	225	300	550	650	20	35	720	700	120	130
15	250	330	550	650	25	35	710	695	130	145
20	250	330	550	650	22	35	710	690	130	150
40	250	330	550	650	27	35	700	685	130	160
80	250	330	550	650	21	35	700	685	120	140

Musa U2MIR Goes to School

JIM LINTON VK3PC

STUDENTS IN THE RURAL town of Colac in western Victoria, Australia, have scored a world first by chatting with two cosmonauts on the Russian space station MIR.

The history-making event captured the imagination of the local community, and achieved some very good publicity in the media for the hobby of amateur radio. Computer studies and information technology teacher at Trinity College, Maggie Iaquinto VK3CFI, said the locals understandably were at first very sceptical about her claim she could talk with spacemen. A communication link involving three orbit passes was set up which enabled students to chat with Musa Manarov U2MIR and Victor U9MIR — but more about that later in this article.

Maggie had personally tried for two years to make radio contact with MIR on 2m FM. She achieved her ambition in a voice contact with Musa Manarov U2MIR on at 2145 UTC on 13 January 1991. "I told him I have been trying for two years to work him. The orbit pass then ended," Maggie said.

During the brief contact Maggie used some Russian language she remembered from school days. The next morning while having coffee Musa called VK3CFI who advised she lived in a small town named Colac in a dairying district. "I asked if Victor U9MIR was available, and Musa introduced him as "Flight Commander Victor" and I gave him my name in Russian." Maggie exchanged family details with both of the cosmonauts. They appeared to take a liking to her, undoubtedly aided by VK3CFI's familiarity with the Russian language.

"I Want to Connect Now, Now!" — Musa

Some time later in the early morning her rig came to life with the deep, heavily-accented voice of Musa calling for "Margarita Ivanovna" — her maiden name. Maggie is an American-born Hungarian. She had an interest in the Russian language in the 1960s and gained a bachelor degree in the language from Boston University. Musa wanted to know what she did in Colac, and was told of her computer teaching at Trinity College. Mention was made that an antenna has been put up at the school, and as part of Information Technology classes during this students were shown packet radio. Politely the cosmonaut expressed a desire for Maggie to teach him how to get going in packet.

On a later pass Musa said: "I have a question!" Maggie responded with "Go ahead." U2MIR said: "I want to test packet radio with you." The pair agreed to use a frequency of 147.575MHz. Musa insisted: "I want to connect NOW, NOW!" He made a connect, but the pass was then over. Maggie said it must have been "a moment of triumph for Musa — he must have been so happy." The connect gave VK3CFI the world's first packet contact with U2MIR at 1955 UTC on 18 January 1991.

Some reports from the United States on the packet system claim US radio amateurs were the first to connect with U2MIR on 21 January — but this was several days after VK3CFI verified contact. On 18 January the U2MIR packet transmission also showed up on the "heard" log of many VK3 and VK2 stations — much to their surprise. News from Colac that U2MIR had begun packet transmissions came as a complete surprise to the mainstream amateur satellite fraternity.

Maggie said: "On packet Musa asked for instructions in getting his PMS (personal message service) going. I sent him a file and, by the next pass, 92 minutes later, he had it going." Communications returned to 145.550MHz — the standard MIR frequency — because if European stations wanted packet contact with MIR, it was not possible in some countries on 147.575MHz.

Further lessons were given to Musa to improve his packet operation. Maggie wrote in plain language for Musa packet procedures. She stresses that the exercise was the result of collective wisdom of a number of packet experts throughout VK3 and elsewhere. They eagerly gave advice, hints and tips which made it possible for U2MIR to fully get up and going on packet. Among those involved were Lou VK3DFI (Maggie's OM), Andy VK3DTO, David VK3YLV and Gary VK3JAV — who registered U2MIR on his BBS (Bulletin Board Service).

"Want to Speak to a Cosmonaut?" — Students Asked

During a contact, Maggie suggested to Musa and Victor that they might like to talk to school children. They readily agreed. Then the proposition was put to the Trinity College students: "Anyone who wants to speak to a Soviet cosmonaut, please contact Mrs Iaquinto." Later, a concerned mother of one of the students stopped Maggie in the street. "My daughter is rather agitated — she tells me she is going to talk to a man in space," the woman said. "Have no fear; she's going to talk to two men in space," replied Maggie in a calming voice.

A group of about 50 parents, teachers and students gathered at Maggie's home on 14 February to join in the history-making event. Some 21 children spoke to the cosmonauts during three orbit passes while MIR was in radio range for about 10 minutes each time. The students either spoke via a microphone or sent their prepared questions to MIR using packet radio. It is believed to be the first radio contact of its type in the western world. Musa, who spent a record 365 days in space on board MIR in 1988, and Victor, seemed pleased to chat with the students. Musa speaks a little English, and Victor only Russian — and Maggie helped the flow of conversation through her somewhat rusty knowledge of Russian.

"The students are still working through their experience — it has had quite an amazing impact," she said weeks later. Their horizons and thoughts had been broadened beyond belief, she said. "A lot of kids in a very small town now know a heck of a lot about satellites, space, cosmonauts and the human side of these space pioneers."

"It was important to focus on the children rather than her role in helping make the link possible", Maggie said modestly. The event captured the imagination of the entire Colac community. Reports on it have appeared in several major Australian newspapers, and on news and talk programs on broadcast radio stations. **ar**

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The History of the WIA Journal Part 3

COLIN MACKINNON VK2DYM 52 MILLS ROAD GLENHAVEN 2156

(continued from March issue)

RADIO MONTHLY SEEMS to have run into trouble in September '32 as from that time less glossy paper was substituted. The November '32 issue did not appear and instead Vol 1 No 12 combined the November and December issues and signalled a new cover design, new owners, new amateur correspondents and a reduction to 56 pages. The new publisher was Briton Publications who continued to December '33 when Amateur Radio and Broadcast Monthly became the publisher. The price was then reduced to 6d, and it included more amateur information, but it lasted only until May 1934. The WIA had been unreliable in providing news for the magazine and eventually ceased to be associated with it from around July 1933.

Although it was not associated with the WIA, there is an interesting sidelight concerning the magazine *Australian Radio News*. This magazine of around 50 pages and costing 2d was published every Friday by *The Bulletin* newspaper, in Sydney. The first issue was in May 1932. It was common for magazines of the era to be the official organ of various groups and *Australian Radio News* was the journal of The Australian Radio Artists Association, The Australian Flying Corps Association and the Zero Beat Radio Club.

The main content of the magazine was radio programs for the week and news of broadcast personalities. Don Knock VK2NO, who had recently left *Radio Monthly*, became the technical editor and conducted technical and gossip columns for amateurs.

At this point it is opportune to remind you that in February 1932 the WIA NSW Division ceased to exist, having been renamed the Institute of Radio Engineers. This did not please those who were hobbyist amateurs, who promptly formed the Association of Radio Amateurs (NSW) and news of their activities was included in the journal *Radio Monthly*. In late May '33, Don Knock, who also happened to be the Vice-President of the ARA, proposed to the committee of the ARA (NSW) that his magazine, *Australian Radio News*, should become the official organ of the ARA and would provide two pages per week free for amateur news, with a guaranteed circulation of 20,000. The publishers demanded an immediate acceptance from the ARA, but instead the committee chose to rebuff Knock and, at the next meeting of the ARA, a motion was passed to the effect that the constitution of the ARA be altered to ensure that any official journal be selected by a 2/3 majority of all members by ballot. At the same meeting Don Knock (the vice-president) and R H W Power (the secretary) resigned from the ARA!

The *Australian Radio News* ceased publication with the 15 June 1934 issue and was thereafter incorporated in *The Bulletin*.

Stability at Last

After the partnership with *Radio Monthly* ceased, a small band of Victorian amateurs decided to continue a WIA publication and, so, in October 1933 the first copy of *Amateur Radio* was released, at a price of 6d and comprising 20 small pages of news items from the Victorian Division and its affiliated clubs, plus one technical article. The front cover proclaimed that it was "published in the interests of amateur radio by the Wireless Institute of Australia (Vic Div) official organ of the Royal Australian Air Force Wireless Reserve". The second issue contained news from the other states and with a spirit of co-operation not seen before, *Amateur Radio* (or *AR*) was on its way to becoming the strong amateur radio magazine it is today.

During WWII the financial and manpower resources of the WIA (Vic) were sadly depleted and so *Amateur Radio* was produced as a typed and duplicated newsletter of 10-16 pages. The February 1941 issue was missed, but then the wartime version was issued from March '41 right through to September '45. The October 1945 issue reverted to a commercially printed magazine format. See *Amateur Radio* for October 1958 for more details of the history of *AR*.

There are many tales of political manoeuvring, ego trips, vested interests and even some skulduggery in the history of the WIA publications prior to our current magazine, but we now have in *Amateur Radio* a magazine that compares very favourably with any other like publication and has the support and stability to go on for the next 70 years.

I have carefully checked the facts for this article, but if anyone can add further information please let me know so that we can maintain an accurate record of our history. Write to Colin MacKinnon VK2DYM, 52 Mills Rd, Glenhaven, 2156.

Chronology of WIA Milestones

Date	Event
1/8/1914	Last pre-WWI meeting of Wireless Institute of NSW
7/1/1919	First post-war meeting of Wireless Institute of NSW
14/3/1919	First post-war general meeting of Wireless Institute of NSW
19/3/1919	First post-war meeting of Wireless Institute of Queensland
1/4/1919	First post-war meeting of Wireless Institute of Victoria
11/9/1919	First post-war meeting of Wireless Institute of South Australia
28/10/1919	First post-war meeting of Wireless Society of New Zealand
3/11/1919	First post-war meeting of Wireless Institute of Western Australia
December 1919	*Sea, Land and Air* becomes official journal of WIA. Later changes name to *Radio in Australia and New Zealand.*
October 1923	*Radio in Australia and New Zealand* no longer the WIA journal.
December 1923	*Radio Experimenter* becomes the unofficial journal of WIA. Later changes name to *Radio Experimenter and Broadcaster.*
July 1924	*Radio Experimenter and Broadcaster* no longer the (unofficial) WIA journal.
August 1924	*Experimental Radio Broadcast News* the journal of the WIA Federal Convention, Victorian Division. Later changes name *to Radio Broadcast*
August 1925	*Radio Broadcast* becomes official journal of

Continued on page 22

The ACPF

(ANTIPODEAN CONTRAPOLAR FREQUENCIES)
BY NED STOUT VK6**

SLIM AND I HAD JUST FINISHED cleaning up the lab and were having a cup of coffee when the boss strolled in. Slim was looking rather pensive, obviously deep in thought about something. I don't remember how the conversation began, but apparently Slim had been wondering about something he had noticed while cleaning the tea-room basin. It had something to do with that old question about the direction of the swirl the water takes when it goes down the drain. Of course, most educated people know that the water swirls clockwise in the southern hemisphere, and does the opposite in the northern hemisphere (or is it the other way around?). Passengers on ocean liners have observed that the water tends to go straight down while the ship is crossing the equator.

The conversation started when the boss mentioned something he had read in a magazine which had been sent to him by a friend along with a bunch of other stuff which had been thrown out in a shack cleanup. This friend was from someplace in the United States (in the northern hemisphere). The magazine can't be mentioned here, of course, for ethical reasons, but its initials were QST.

Apparently the premise had been made that, when considered from a mathematical point of view, an AC line voltage is not really alternating over a zero point but is, in fact, always alternating in a positive sense. That is to say that what we here in Australia consider as being 50 cycles AC is, in reality, only 50 cycles **more** than **nothing**. Conversely, if it were possible to generate a true AC, you would produce energy under the zero point also, ie 50 **contrapolar** cycles. The boss stressed that this early study had been done on 60 cycles; he wondered if any difference might be noted on a 50-cycle contrapolar line voltage. It was about then that Slim made a profound observation, that there would be no difference between 50- and 60-cycle power in regard to contrapolar frequencies. In fact, none of us in the lab is good enough at maths to offer any critical analysis to either support or reject Slim's contention.

Some of you may recall the original northern hemisphere study but, for those who can't, I'll tell you that the outstanding characteristic of contrapolar frequency (we'll call it CPF) is that it does not produce heat when applied to a resistance. In fact, CPF does the opposite and generates **cold!** The boss suggested that he felt that some short-sighted soldering iron manufacturer had bought the patents on this invention, and that the drawings had probably been burned.

As all hams know, heat is the real enemy of almost all electrical devices. In fact, heat is the enemy of all mechanical devices as well. Then I got to thinking about the specifications of vacuum tubes (we say valves). I recalled that there was a specification relating to plate dissipation. The capabilities of power output valves (in a transmitter final stage, for example) are limited by the amount of power that the physical components of the valve can dissipate without being destroyed on the process.

If there was a "smarter" way of dissipating that dreaded heat, greater power amplification could be obtained from smaller valves. Of course! We could use CPF to operate the filaments of a small valve, with positive DC on the plates!! Then, with a valve the size of, say, a 1S4, we could run a kilowatt. For those more recent converts to the hobby, a 1S4 is a valve about the size of your thumb, used in battery-operated portable radios before the war, before the advent of the transistor.

Thinking about it more, one realises that even the much-touted transistor is limited by its lack of ability to dissipate heat. To illustrate the point, look at the low output ratings of modern solid-state transceivers. Of course, CPF would not be used in portable equipment, at least until smaller CPF generators are designed. However, for base station operation, transistors with kW outputs could obviously be developed. Think of how simple it would be to put filaments into the final amplifiers! Linear amplifiers about the size of cigar boxes could be constructed. You could build transceivers with integral stubby holders... the mind boggles!

Of course, there are still some minor technical obstacles to overcome, but the boss has the connections, the initiative and, especially, the capital to overcome these problems.

Slim proposed that we set up a branch lab in Heard Island to start investigations, but the boss wants to talk to some of his powerful friends overseas about conducting research in outer space. Me? I'm mentally sending CQ CQ CQ de VK6**/0. ar

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The History of the WIA Journal Part 3 *(continued from page 21)*

	WIA.
June 1927	*Radio Broadcast* fades into obscurity.
July 1927	First issue of *QTC* as journal of Queensland Radio Transmitters League.
November 1927	*Radio Journal of Australia* commences as journal of WIA NSW Division
December 1927	First issue of *CQ* as journal of New South Wales Radio Transmitters League.
March 1928	*Radio Journal of Australia* ceases production.
August 1928	*QTC* becomes journal of the Australian Radio Transmitters League.
May 1929	*QTC* becomes journal of the WIA Qld Division.
July 1929	*QTC* becomes journal of the WIA.
September 1929	*CQ* becomes journal of the WIA NSW Division.
December 1929	*CQ* ceases publication.
April 1931	*Radio Review* commences. Later changes name to *TV and Radio Review.*
December 1931	First issue of *TV and Radio Review* as official WIA journal.
February 1932	WIA NSW converted into the Institute of Radio Engineers.
February 1932	TV and *Radio Review* no longer the WIA journal.
February 1932	*Radio Monthly* becomes the WIA journal.
July 1933	*Radio Monthly* no longer the WIA journal.
October 1933	First issue of *Amateur Radio.*

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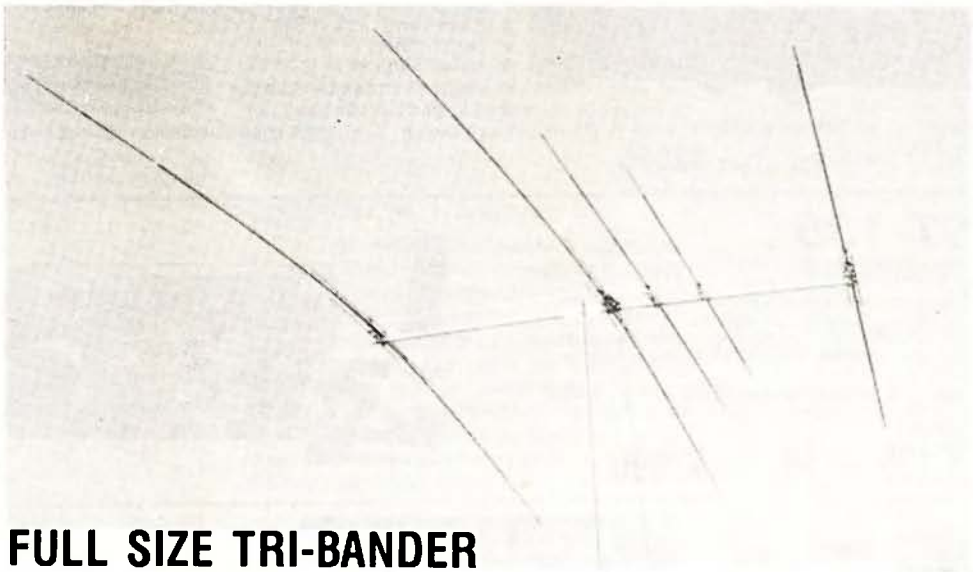

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BOOM — 4m
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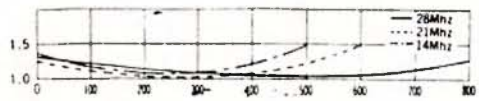
WEIGHT — 22kg



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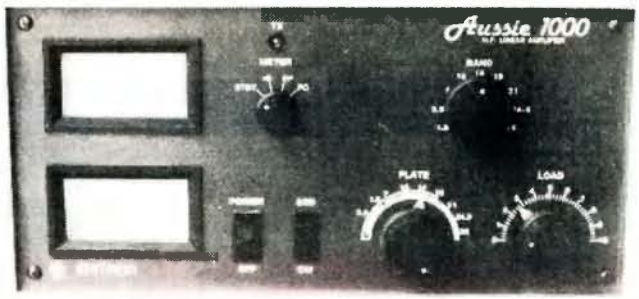

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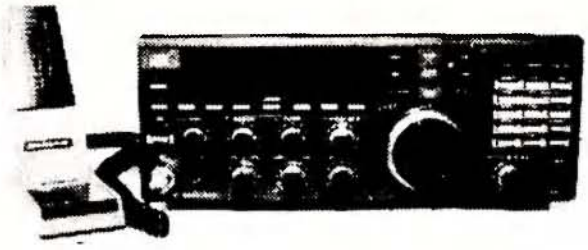

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1990 FEDERAL CONVENTION REPORTS

The statutory closing date for receipt of Annual Reports to be tabled at the 1991 Federal Convention of the WIA was 20th March 1991. Published below for members information are all those reports that were received by the 5th March closing date for this issue of Amateur Radio magazine.

ANNUAL REPORT OF THE FEDERAL PRESIDENT FOR 1990

This past year has seen the results of the processes that have been put in place in the Federal sphere of the WIA. The best indicator is the successful financial result, the best for some years. This is a tribute to the management practices that have been introduced over the last few years.

EXECUTIVE MATTERS

FEDERAL OFFICE

Bill Roper, as General Manager and Secretary, has continued to bring his management expertise to bear on all aspects of the operation of the Federal Office. This not only includes the Office and its secretariat role to the Executive and the Council, but also the business management of Amateur Radio magazine. Bill is still providing a considerable voluntary contribution to the work of the Executive Office. This involves work on weekends and public holidays. Further, Bill has not been able to take his accrued holidays due to the work load.

We were all saddened to hear of the death of Ann McCurdy. Ann had worked in the Office for ten years and was well known and liked by many amateurs around Australia. Her smiling face and cheery voice will be missed.

Brenda Edmonds resigned from the Executive in November 1990 and has taken on the position of Assistant Manager.

FEDERAL EXECUTIVE

This is the second year when the bulk of the Federal Executive members come from outside of Melbourne. As before, this has brought a wider view of amateur radio matters and has proved to be very useful. The members of the Executive elected in 1990 were George Brzostowski, VK1GB; Brenda Edmonds, VK3KT; Joe Gelston, VK7JG; Ron Henderson, VK1RH (Vice Chairman); David Jerome, VK4YAN; Peter Maclellan, VK3BWD; Kevin Olds, VK1OK; Neil Penfold, VK6NE; Bill Rice, VK3ABP; Terry Ryeland, VK2UX and Bill Wardrop, VK5AWM. David Wardlaw, VK3ADW, was co-opted onto Executive as Immediate Past President. Brenda Edmonds resigned in November and the vacancy remained unfilled. Arthur Evans, VK3VQ, was elected to the Executive in September and was appointed to the position of Treasurer.

The Executive is short of one member and it is hoped that a person can be recruited from the Melbourne area to fill this vacancy.

During the year the Executive has met on 11 occasions, with three of these meetings being two-day Saturday and Sunday meetings. These two-day meetings have allowed many items to be considered in detail, particularly items relating to the financial, budget and performance aspects of the WIA. The Tuesday evening meeting in January had to be abandoned because of the lack of a quorum.

The weekend meetings continue to be worthwhile, as a wider group of people are now more aware of what is involved in running the WIA on a daily basis. It has also furthered a better understanding between the Divisions and provided a good opportunity for the exchange of ideas. The representation of each Division on the Executive and the weekend meetings are a successful arrangement and should be continued.

CORPORATE PLANNING

Since its initial presentation in 1989, the Corporate Plan has been reviewed on a regular basis and changes incorporated as issues were considered by the Executive. This document should not be thought of as something which is "set in concrete", but rather as a document which can be regularly updated to take into account the changing needs of the WIA. As expected, progress on some objectives is excellent, while work on other objectives still await the necessary resources.

AMATEUR RADIO MAGAZINE

Our magazine continues to improve, which is a tribute to the Publications Committee, the Executive Editor, Bill Rice, the Managing Editor, Graham Thornton and the Business Manager, Bill Roper. Feedback from members on the magazine, particularly the February data issue, has been very positive.

INTERNATIONAL MATTERS

Preparation for the World Administrative Radio Conference, to be held in Barcelona, Spain in 1992, is well under way. David Wardlaw and Ron Henderson have been attending working party meetings along with representatives of DoTC and other spectrum users. In addition, close liaison is being maintained with other Amateur Radio Societies (through IARU) and views of other administrations are being noted. David Wardlaw attended a preparatory meeting (JIWP) in Geneva in March 1991.

The next IARU Region 3 Conference will be held in Indonesia in September 1991 and preparations are already under way.

DOTC MATTERS

This year there has been little progress in negotiations with DoTC on a wide variety of matters. Accordingly, the General Manager and I visited Canberra in February to discuss the situation with the Assistant Secretary of the Radio Communication Section. The opportunity was also taken to discuss a number of matters with the Manager of the Licensing Section. Both meetings were intensive and productive, with a number of outstanding matters now having been resolved.

The Devolvement of Examinations has now been completed. Examinations are now being conducted in a variety of locations and at times that suit the participants. Although there were some teething problems, the arrangements seem to be working well. However, the problem that in some parts of this vast country, potential amateurs may find it difficult to locate and attend an examination still remains. This matter will continue to be monitored.

VOLUNTEER CO-ORDINATORS

There are many volunteer co-ordinators who contribute to the activities of the WIA on behalf of the Executive. On behalf of all members of the WIA, I would like to thank the following people for their efforts:

Graham Ratcliff	Amsat
Phil Hardstaff	Awards Manager
Neil Penfold	Contest Manager (acting) and QSL Manager (VK9, VK0)
Brenda Edmonds	Education
Hans Ruckert	EMC
John Edmonds	Historian
Gordon Loveday	Intruder Watch
Ash Nallawalla	International Travel Host Exchange
John Martin	FTAC
Bill Roper and Ron Fisher	Tapes (Federal News)
John Ingham	Tapes (Video)
Leigh Baker	WICEN

Early in 1990, we were sorry to note the passing of Ken Gott, who was the Awards Manager. He had brought an interesting point of view to the position and had some great ideas up his sleeve.

I would also like to thank the members of the Executive, particularly Ron Henderson, and the Office Staff, especially Bill Roper, for their support and encouragement during what has been a very busy year for me.

Peter Gamble, VK3YRP
Federal President

ANNUAL REPORT OF IARU REGION 3 LIAISON OFFICER FOR 1990

STRONG POINTS

As this was not a triennium conference year IARU Region 3 activities were devoted to routine liaison and the IARU work up to WARC 92. All matters arising at the last Region 3 conference in Seoul in 1988 have been concluded, except for a couple of longer term ones associated with DoTC, namely third party traffic definitions and visiting amateur callsigns. We hope for favourable completion of the first shortly; the second appears beyond the ability of DoTCs computerised callsign issue system at present.

During the year the WIA voted on IARU matters concerned with the admission of national amateur societies into the union.

The WIA communicated with the Region 3 Association concerning its management structure and received advice from the directors of the structures of the other two Regions. The WIA will follow this initiative with a firm proposal to the next Region 3 conference in Bandung next October. The WIA also advised all Regions of the activity in Australia concerned with the licensing of RF Tag Identification devices.

The financial statements of the Region 3 Association have caused some concern, for the anticipated income has not been achieved, possibly due to reduced numbers of members in

possibly due to reduced numbers of members in member societies. Furthermore, the expenditures appear to have exceeded the budget planning figures used in Seoul in 1988 to derive a budget for the triennium. The WIA responded to an Association call for financial assistance by donating $US1000 during the year. The WIA will raise these matters, and the associated one of election of a dedicated treasurer, at Bandung.

IARU, in particular the Administrative Council, but to a lesser extent the Region 3 Association, have been busy with preparation for WARC 92. The Association has had to engender a pro amateur radio spirit in the administrations of the many small island states within the region. The WIA has responded to an IARU request and taken part in a special monitoring survey of selected frequencies (see WIA IW Coordinators report).

The International Representation fund, set up by Federal Council two years ago, has been of immense value in planning our international activities in these busy times. The fund must provide for all WARC 92 preparation, including JIWP attendance, bi-annual liaison visits to NZART and attendance at Region 3 conferences every three years. I strongly applaud the wisdom of the Council in creating such a fund and believe it should be a perpetual one, continuing after WARC 92. Naturally the level of members contribution will need reviewing after that major event; a full review at the 1993 Federal Convention appears appropriate.

With the next Region 3 conference six months away it is time to complete our issue papers for that meeting. We have advised topics of concern through Amateur Radio magazine and a couple appear in some detail in this report. I am always willing to accept assistance in preparation of Conference papers and look forward to members inputs.

RECOMMENDATION

NOTING the state of the International Representation fund and NOTING the paucity of WIA members with exposure in the international forum,

I RECOMMEND a WIA funded delegation of four attend the Region 3 conference in Bandung in October 1991.

Ron **Henderson, VK1RH**
WIA IARU Region 3 Liaison Officer

ANNUAL FEDERAL FINANCIAL REPORT FOR 1990

The full financial statements of the Federal body of the WIA for 1990, audited by Harmon Partners, will be submitted to the 1991 Federal Convention. The financial statements of the individual Divisions of the WIA are quite separate from the Federal financial statements.

Complete publication of the Federal WIA financial statements would not only take up a lot of space in Amateur Radio magazine, but would also be boring to most members.

For a number of reasons over recent years the Federal body of the WIA has based its finances on a loss budget each year. This resulted in a situation where the reserves of the Federal Body were run down to an all-time low of $175.00 as at 31st December 1989.

However, the outcome of extensive changes and improvements in financial management, which were introduced during 1988 and 1989, was seen in the 1990 financial year which resulted in reserves being lifted to a more healthy $55,513.00.

As a non-profit organisation, the WIA should always budget for an excess of income over expenditure of at least 5% of income. Expenditure for fixed assets (equipment, etc.) can only be made from Accumulated Profits.

The table below shows the Profit and Loss figures for the previous year, 1989; the year in question, 1990; and the budgeted figures for 1991.

If any member has any questions about the finances of the Federal Body of the WIA, please address them in the first instance to the Federal Councillor of the local Division.

Bill Roper, **VK3ARZ,**
General Manager & Secretary

DETAILED PROFIT AND LOSS STATEMENTS

	ACTUAL 1990	ACTUAL 1989	BUDGET 1991
INCOME			
Advertising - Amateur Radio	38456	47750	39024
Call Book	32780	32621	32000
Direct subscriptions - Amateur Radio	7335	4339	7000
Donations	341	142	250
Inserts & Divisional notes - Amateur Radio	389	646	400
Interest received	21564	17436	22500
International donations/levies	23312	2279	12332
Magazines and publications (MagPubs)	5088	10782	3800
Subscriptions	301070	243645	287500
Sundry income	3839	1529	2000
Technical Committee	3582	6485	2400
	437756	367653	409206
LESS EXPENSES			
AMSAT	1565	463	1500
Auditors' remuneration - audit fees	3600	1900	2600
Awards - Amateur Radio	482	315	500
Awards and special projects	459	1558	750
Bad debts written off	331	69	500
Bank charges	2070	1273	2700
Bulk posts - Amateur Radio	35695	37270	35897
Call Book (excluding Executive Office costs)	11583	13619	12000
Committee and Co-ordinator expenses	890	919	1000
Convention expenses	19599	23090	22000
Depreciation	6856	10102	6802
Drafting - Amateur Radio	855	662	1000
Electricity	924	1398	1500
General expenses	687	1784	1000
IARU dues	4897	4347	4900
Insurance & Workcare levy	3753	3135	4365
International representation provision	23645	2279	12332
Long service leave provision	-2052	764	0
Magazines & publications expenses (MagPubs)	4371	7666	2800
Postage & freight	8082	9046	10000
Printing - Amateur Radio	66436	74561	68000
Printing, stationery & office supplies	9305	5567	9000
Production expenses - Amateur Radio	0	1338	0
Promotion, advertising & recruiting	6461	9972	9600
Rent	8211	7575	9095
Repairs & maintenance	1038	3910	2000
Salaries & secretarial	124645	133455	126000
Technical Committee expenses	1760	3030	1150
Telememo - Keylink	0	2118	0
Telephone	2808	2480	3200
Travel - Amateur Radio	0	972	0
Travel - Executive	350	1290	2000
Travel - Office	706	1112	850
Typesetting - Amateur Radio	23982	24849	24500
Wrapping & addressing - Amateur Radio	8424	10219	8700
	382418	404105	388241
NET PROFIT/LOSS	55338	-36452	20965

ANNUAL REPORT OF THE PUBLICATIONS COMMITTEE FOR 1990

In this report for the previous year (to December 1989) there was a reasonably detailed account of the problems encountered and negotiations necessary, firstly to transfer production of Amateur Radio from Betken to this Committee, and secondly to find new typesetters and printers. It was rapidly apparent that the work load was such as to necessitate a paid Managing Editor, and Graham Thornton VK3IY was appointed to the position in May 1989.

It is a pleasure to be able to report that in contrast with 1989 the year of 1990 has involved no traumatic upheavals and has enabled the Committee and the Editors to concentrate on their main task of producing each month the

continued on page 30

DON'T BELIEVE US?

"The best of the best!"... That's what Yaesu and Dick Smith Electronics think of the FT-1000 deluxe HF all-mode transceiver. But don't believe us- read what the experts have to say...

"...it is clearly written and complete, and includes a complete set of schematics and many high quality photos" — QST "The quality of printing and presentation of this book is the best I have seen..." — AR

On operation

"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the Icom IC-781 or the Kenwood TS-9505." — ARA "...I found the FT-1000 easier to learn and use than any other radio in its class." — QST

On the receiver

"On receive, the performance was often beyond the limit of the latest professional measuring equipment, with no measurable trace whatsoever of synthesizer phase noise." — PW "...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." — QST* "The direct digital synthesizer works very well and produces receiver performance that sets new standards." — AR "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter- SSB

"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST "Reports were all very favourable, especially when using the speech processor." — AR "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

Transmitter- CW

"CW keying was a delight...power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." — AR "On CW the FT-1000 was absolutely faultless." — ARA "CW operation with the internal keyer is a breeze... In QSK CW operation, the rig has well shaped and weighted keying." — QST

Transmitter- RTTY/Packet

"Using the set on HF packet was an absolute pleasure..." — PW "RTTY and packet radio operation with the '1000 are straight forward..." — QST "Packet and RTTY modes were tried and proved just superb." — ARA

Conclusion

"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW "...the FT-1000 represents unbeatable value..." — AR "It is an excellent set worthy of accolades and rave." — ARA "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST*

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver, and easy to use controls put if far ahead of the competition. Wouldn't you rather be using the "Best of the best"?

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AR — Amateur Radio August 1990
PW — Practical Wireless January 1990
QST — ARRL QST March 1991 *(review with optional filters fitted)

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— 2.5 watts RF output as standard, up to 5 watts with 12V DC (or FNB-11)
— Better than 0.16uV (12dB SINAD) sensitivity
— Programmable power saver for extended operating periods
— Keypad or dial frequency entry, with 5 selectable tuning rates
— 49 tunable memories which store repeater offsets
— Band, memory, priority, or limited-band scanning
— Carry case, belt clip, approved AC charger
— **2 Year Warranty!**

*** Now with enhanced receiver sensitivity and strong signal handling!**

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THE AMAZING FT-470

Hand held performance at its best! The FT-470 represents the pinnacle of high-tech design in compact hand helds providing both 2m and 70cm coverage in one. 2.3 watts on the 2m and 70cm bands with the latest multi-tasking microprocessor control allows a high degree of flexibility. In fact, several functions can be performed simultaneously - including 'dual-band' reception, as well as 'full duplex' operation! That's right, you can be talking through your local 2m repeater and scanning channels for your next 70cm contact at the same time.

There are also 21 tuneable memories and 2 VFO's per band, plus inbuilt C.T.C.S.S. (Tone Squelch, encode/decode) with paging facility, a variety of scanning facilities, LCD display showing 5.5 frequency digits on both bands at the same time, and an LCD bargraph signal/P.O. meter. The programmable 'power saver' system helps maximize battery life, and frequency selection via tuning knob or direct keyboard entry is a standard feature. Comes complete with an ultra long-life 1000mAH NiCad battery pack, carry case, dual band antenna, and an approved AC charger. Why buy 2 hand-helds when you can have everything in one?

See A.R.A review Vol 12, Issue 5, or A.R. review Aug '89 issue.

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Unbelievable value! We have scoop purchased Uniden's entire Australian stocks of this excellent 28MHz all-mode amateur transceiver and passed on the savings to you. Normally the HR-2510 sells for $499... our price is just $299! You save $200!

The HR-2510 is a solidly built transceiver ideal for either mobile or base use and especially suitable for novice operators due to its ease of use, operating features, and output power.

- Complete 28.0 to 29.7MHz coverage with selectable 100Hz, 1kHz, and 10kHz VFO tuning steps and giant 500kHz band segment steps
- All mode operation USB, LSB, CW, AM, FM
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- 25 watts output (SSB,CW), 10watt carrier output (AM/FM)
- Receiver sensitivity: SSB,CW 0.25uV for 10dB S/N
  AM 0.5uV for 10dB S/N
  FM 0.5uV for 20dB S/N
- Controls: RF gain, Mic gain switch, Noise blanker switch, Dimmer switch, Squelch control, SWR calibrate control, up/down channel switches, & Frequency lock switch
- Power: 13.8VDC at 5A (max)
- Microprocessor: UC1250A (new version)

Includes microphone with up/down channel controls, mobile mounting hardware, DC power cord, and various accessory plugs. Covered by Uniden's 1 year warranty

Enjoy the great 10 metre band conditions with an HR-2510 from Dick Smith Electronics!

Cat D-2600

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Want to go 10m mobile... then check out this great value antenna pack. Originally designed for 27MHz use, this quality 5ft helical antenna can easily be cut for use with the HR-2510 28MHz transceiver listed above. The pack comes complete with an antenna base and 3.5 metres of RG-58C/U coax terminated with a moulded PL-259 plug.

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best issue of Amateur Radio that can be put together from the available material. From this follows the further duty of planning and organising in advance to ensure sufficient appropriate material will always be available.

As regards the supply of material (ie articles, photographs, columns, letters etc) there are two extreme opposite ways in which this may come about. One extreme is simply to accept whatever is submitted by anyone who is motivated to make a contribution. The other is to plan in advance, in precise detail, exactly what is to be published, and to commission selected authors to write exactly what the plan requires. In the past, we have been much closer to the first extreme than the second. However, in order to provide our readers more closely with the magazine they require, we are now attempting to introduce more advance planning; but I expect it to be a long time, if ever, before we are closer to the second extreme than the first!

Obviously, planning is pointless unless there is good information as to what the readership requires. We receive a good deal of feedback from members, and towards the end of the year four committee members put a good deal of time into soliciting opinions from members of several major clubs. Their findings were released in a report in December, which provides rather more quantitative guidance as to the "mix of material" than we have had before.

On the financial side the year proved to be highly successful. In spite of indications earlier that advertising revenue might be less than the budget figure it actually totalled nearly $1000 more than expected. Overseas direct subscriptions were nearly twice the expectations, and overall income, a little over $46000, was up by almost $4000. Costs were below budget ($222000 versus $241000) mainly due to the reduction from 64 to 56 pages which took effect in May. The end result was that the balance provided from membership funds was $27000 less than budget, and the net cost per copy mailed to each member was $2.08 rather than $2.40.

Two new members joined the Publications Committee during the year. These were Norm Eyres (VK3ZEP) and Bob Tait (VK3ERG). However, Brenda Edmonds (VK3KT) who had indicated interest in becoming Assistant Editor has left the Committee to become Assistant Manager of the Executive Office. The death of Ken Gott (VK3AJU) early in March was also a great loss, as although not a Committee member Ken helped each month with a share of the proof reading.

There is still a need for more members on the Publications Committee. Having been Editor or Executive Editor for seven years, I feel that it is time to retire, and one or two others who have given many years service would do likewise if successors could be found. The task requirements for a Committee member are such that most people in regular employment would be able to spare the necessary time. I have doubts, though, as to the Editor's ability to do justice to the position and also maintain a normal job. It requires someone who is either retired, or has at most a part-time job. Unfortunately, when as in my case, the Editor is also a member of Executive, and thus as a director precluded from receiving payment, the position becomes even less attractive. Perhaps the time is not far off when the present paid Managing Editor and unpaid Executive Editor positions need to be merged into one full-time paid position.

In conclusion, it has been a very satisfying year for Amateur Radio magazine. The production and typesetting procedures which have evolved as Graham has settled in as Managing Editor are now working reasonably smoothly. Redfords, the typesetters, are co-operative and helpful, and the main problems which have been encountered (rather frustrating at the time!) have involved software inadequacies, particularly in the tabulation of data. I would like to thank everyone involved with the magazine for their help and co-operation. This includes Redfords, all members of the Publications Committee, and all staff in the Executive Office, not to mention all our contributors and particularly the regular columnists, and also our volunteer proof-readers. Thank you all very much indeed!

Bill Rice VK3ABP,
Executive Editor

ANNUAL REPORT OF FEDERAL TECHNICAL ADVISORY COMMITTEE FOR 1990

During the past year, the Committee has undergone substantial changes in membership and has made progress in a number of areas.

Membership: Five Divisions appointed new TAC representatives during the year. New technical panel members have been appointed to advise on Microwaves and EME, and the Chairman has taken responsibility for VHF-UHF records. Consultation is running smoothly, thanks to the enthusiasm of panel members.

Database: The beacon and repeater Database has been completely revised with information received from Divisions, repeater groups and individuals.

VHF-UHF Activity: A number of new records have been processed, especially for the microwave bands. Certificates will be issued to all record holders. A directory of active microwave operators has been compiled.

Repeaters: Standard CTCSS access tones have been adopted for repeater IMD protection and access to cross linked repeaters. DoTC's continued over-regulation in the areas of linking and identification are a major frustration to repeater groups and seem contrary to DoTC's policy of deregulation.

Packet Radio: The number of data channels on the two metre band has been increased, and data segments have been established on the 6 metre, 70cm, 23cm and higher bands. Further information is needed from packet radio groups on future spectrum needs. DoTC's stringent identification requirements are a problem and further discussions are needed on this subject.

Band Planning: Minor changes have been made in the band plans to expand the EME segments on all VHF-UHF bands. The 6 metre band repeater segment has been expanded and a national co-ordination of frequency allocations has been established. The 23cm band plan has been modified to restore the second ATV channel. New band plans for the 13cm and higher bands have been developed and presented.

Beacons: No progress has been made in transferring the 10 metre band beacons to the new time sharing scheme, due to the lack of response from the IBP Co-ordinator. A new continuous duty beacon segment has been established at 50.250 - 50.300 MHz. Steps are needed to standardise beacon frequencies and polarisation, and to reactivate inoperative beacons.

Frequency Allocations: Continued discussion with DoTC is recommended with a view to obtaining a replacement for the 576 MHz band. Plans should be developed for future use of 1270 - 1280 MHz when the CAA radars are phased out. Continued uncertainty over the 2300 - 2450 MHz band needs resolution.

Conclusion: The past year has been successful, with a number of issues resolved and others well on the way. Most of the problems have been due to the continued failure of DoTC to fully implement its policy of deregulation.

I would like to thank the members of the FTAC technical panel, and the Divisional representatives, for their effective and helpful approach. Thanks also to Bill Roper and the staff of the Federal Executive office for their friendly assistance.

Recommendations: 1. That Executive regard the regulations on voice and packet repeater linking and identification as a top priority for action in 1991, and that the matter be pursued most vigorously at forthcoming WIA - DoTC joint meetings.

2. That steps be taken to upgrade the national VHF-UHF beacon network.

3. That continued efforts be made to secure the future availability of 1270-1280 MHz and the 13cm band; a suitable allocation to replace the 576 MHz band; an expanded 80 metre allocation; and the establishment of exclusive amateur segments in each of the bands between 144 MHz and 24 GHz.

John Martin VK3ZJC,
Chairman, FTAC

ANNUAL REPORT OF FEDERAL INTRUDER WATCH CO-ORDINATOR FOR 1990

The last yearly report (1989) I made a comment about it being a disturbed year, but 1990 was even more disturbed. Although we have put into place measures to help DoTC, they in turn have NIL to assist us! Their HF direction finding equipment has not materialised, a fact we should have suspected as being a ploy to keep us quiet. The DoTC seems more inclined to sit on its hands as far as international intrusions are concerned, and wait for the local intrusions to appear....these are much easier to deal with.

We now have the threat of "Spectrum buying" on our doorstep - how come we have "interested parties" being ALLOWED to purchase the air we breathe? Interesting new angle, don't you agree?

I beg to differ on the statement made by DoTC, re the ID of overseas countries, "supporting illegal ops" within our legal bands - most of the persistent intruders, eg, VRQ and its clone of stations, belong to Vietnam. This we have known ever since they became intruders, thanks to the diligence of amateur operators and SWL's. DoTC cannot claim credit for this. We make it our business to find out and so doing become the experts.

In 1985 we were advised that the USSR would remove UMS from 21032 and 14141 MHz. THEY are still there and 21283.5, no further comments have been evidently made to Moscow, as to why they have not been removed from our bands....how long do we have to wait? It is high time in my opinion, that the IARUMS Co-ord (ZL1BAD) was allowed to report direct to the ITU IFRB about transgressions into our bands by the countries named in our reports. The "softly-softly" approach in my letter of 16/10/90 referred to recruitment of observers, NOT to DoTC, with them I could be the opposite, if needs be.

Some statistics (for those who like them)

Total observers in one month 17

B/cast mode	851 intrusions
RTTY F1B	1309 intrusions
CW A1A	1041 intrusions
Other FSK and C	507 intrusions
UMS on 24 hrs USR	805 intrusions
VRQ Vietnam	446 intrusions

No CB stations were listed.

Problems - main one is no co-ords in VK's 3 & 5; I think the Divisions there should pull their weight more in this direction, the VK2 co-ord is not a very well person I believe, he helps out obviously only when he is fit.

Our achievements have been practically nil, so this brings me to conclusions. It seems we are fighting a losing battle UNLESS we can break the DoTC barrier and get an active amateur in that department, who can look after us, with the complete backing of the government, when tackling infringing governments.

Gordon Loveday VK4KAL,
Federal Intruder Watch Co-ordinator

ANNUAL REPORT OF FEDERAL CONTEST MANAGER FOR 1990

With the new Administration of the WIA Contests and the present organisation, which overcame the loading of all Contest work onto one person, more people are now involved in Contest matters, including the Executive Office.

Present Co-ordinators are:

VK3ZJC John Martin - Ross Hull Contest

VK1PC Phil Raynor - J.M.F.D. Contest

VK6ANC Northern Corridor Radio Group - RD Contest

VK7BC Frank Beech - VK/ZL Contest

VK2ATZ Westlakes ARC - Australian Novice Contest

Its pleasing to now have several Divisions supporting contest work.

It should be easier in future to replace a co-ordinator as the new person knows that the load is now only a quarter of what is was in the past.

The role of the Executive Office must be acknowledged as it carries out the preparation and dispatch of Contest certificates. This also eases the co-ordinators burden. Their swift despatching of certificates, usually before the results are printed in Amateur Radio magazine, is very commendable.

Some criticism has been received from a member or two saying that more rules and dates of contests should be printed in Amateur Radio. This has been agreed to in general; however, the members have also been told that if overseas rules are not supplied, its just a little difficult to print them! Also the amount of VK activity in overseas contests is very limited.

And now into 1991, consolidating what has been achieved, and improving on the past efforts.

RECOMMENDATIONS

RD CONTEST

A letter was published in "Over To You" in December 1990 issue of Amateur Radio magazine which asked readers if they agreed to a proposal that instead of a log being submitted for checking, a summary sheet would be acceptable instead, and this would save on postage etc. etc.

This is quite a radical move to make; however, unless tried out, one can only conjure up what the overall effect would be if put in place. Only verbal reply, no written, has been received, and this has all been favourable.

Therefore the following recommendations are made:

1. Entrants to the RD Contest to submit a summary sheet instead of a log.

2. The Contest Co-ordinator may call up any log to prove the summary sheet of an entrant. This is to be done at the Co-ordinators discretion.

3. The RD Contest Co-ordinator to use 1. & 2. as the basis for writing rules for the 1991 Contest and future contests, unless rejected by Federal Council.

VK/ZL CONTEST

To give some value to winning a certificate, a benchmark is required. Usually this takes the form of "Top Scorer" in that section or country.

In the VK/ZL Contest it is not unusual to receive only one or two entries from a country. These may contain only four or five contacts, and the "Winner" picks up a certificate. No contest skill was needed and the cost to the WIA would not be less than $5.00 to send out the piece of wallpaper.

Some years ago, during the time that the Contest was administered by VK6NE/VK3QV, the benchmark was set so as to give this value to winning. It is recommended that it be written into the rules again, as there is apparently no reason for it ever being dropped.

Recommendations: Certificates to be awarded where:

1. There are more than five entries from that country

2. If less than five entries the top scoring from that country scores 500 points or more.

Neil Penfold, VK6NE,
Federal Contest Co-ordinator

ANNUAL REPORT OF JOHN MOYLE FIELD DAY CO-ORDINATOR FOR 1990

PROBLEMS

This contest suffered from a lot of seemingly complicated rules, not necessarily so to regular contesters. This scared away new enthusiasts. The extra bonus for "natural" power was only used by those clubs or individuals who had either a large bank balance or access through work or educational/work resources. There did not appear to be any experimentation in this field just buy/borrow and hookup. The points system was complicated by trying to make allowances for the ZL contest. Of the few hundred stations that operated only a meagre 59 logs were submitted. Some sections could have been won by a station that did not submit a log.

HIGH POINTS

The contest as usual was enjoyed by all who took part. Most operators were considerate and friendly. Many stations appeared to thoroughly enjoy the weekend in the bush with either family or friends. Valuable field operating experience was gained which could prove extremely useful in an emergency.

CONCLUSION

The rules need stabilisation, achieved by leaving this years rules in force, unchanged for at least three years. At the end of three years the rules should only need tuning to correct any deficiencies. The contest is badly in need of more participants. This should be achieved with the new rules, which will remain in force for three years. "Natural" power did not achieve its aim, hence the bonus points were not allowed in the current rules. Repeat contacts were reintroduced, hopefully to increase the number of contestants.

Phil Raynor VK1PJ

ANNUAL REPORT OF NOVICE CONTEST CO-ORDINATOR FOR 1990

The 1990 Contest was run with a good standard of log entry and comments received with the logs were favourable.

Participation remained average and was marked by a low number of entries from Novices! Indications were that many took part in the contest but did not submit a log. A number of club stations entered, hopefully these had novices in attendance, and so were giving experience to new novices as well as other operations.

RECOMMENDATIONS

Novice Contest Rules

1. A listener (SWL) entry may only log 10 sequential contacts made by a station, and then must log no less than another 5 (five) stations before logging that station again. The 5 stations so logged, only need a minimum of one contact logged.

Ken Miller VK2GKM

ANNUAL REPORT OF ROSS HULL VHF-UHF CONTEST CO-ORDINATOR

ACTIVITY

Activity in the first week of the contest was quite high, especially on 6 metres, however it tapered off noticeably after New Year's Day. The introduction of separate awards for each band resulted in higher activity on 70 cm and above. Some difficulty was experienced with

contest activity on calling frequencies, especially on 6 metres.

SCORING

Scoring based on distance was well received. Although there was far more than usual activity on 6 metres, it is clear that the other bands were at a great disadvantage in scoring. There is a strong body of opinion that 6 metres should be dropped from the contest, or that its scoring potential be reduced so that it is on a par with the other bands.

CONTEST LENGTH

The longer contest, with scoring based on the best seven days, was not well received. Most activity was in the first ten days and there were very few "top seven" days after New Year's Day. Log-keeping was complicated by the fact that the best 7 days overall may not have been the best days on any one band. It was suggested that UTC days be dropped in favour of local time.

SUMMARY

Most entrants felt that the new rules were a step in the right direction. However it is clear that the longer duration is not supported, and there is a need to adjust the scoring table.

RECOMMENDATIONS

It is suggested that draft rules for 1991-92 be published for comment, with the following changes:

(1) Duration to revert to approximately 14 days, with scoring based on most or all contest days.

(2) Contest "days" to be aligned with local VK-ZL days.

(3) Scoring by distance to be retained. Band multipliers to be adjusted so that no one band or group of bands has compelling advantage.

(4) Prolonged contest activity on calling frequencies to be discouraged, possibly by nominating preferred contest working frequencies for each band.

(5) The VHF-UHF Field Day be conducted by the Ross Hull Co-ordinator and it become a regular event on the contest calendar of the WIA.

John Martin VK3ZJC,
Ross Hull Coordinator

ANNUAL REPORT OF VHF-UHF FIELD DAY CO-ORDINATOR FOR 1990

Logs are still being received at the time of writing so it is not possible to give a detailed summary of activity. Indications are that activity on higher bands has increased, although interest in the Field Day may have been affected this year by the lack of publicity and the lengthening of the Ross Hull Contest.

The current band multipliers do not reflect the difficulty of portable operation on bands above 70 cm and therefore need revision. It is suggested that multipliers become the same as those used for the Ross Hull Contest.

Field Day scoring is based on locater squares rather than distance. This makes scoring simple and is appropriate for a contest of this kind. It could also stimulate interest in the new Grid Square Award, and vice versa.

There is some doubt as to whether the Australia Day weekend is the most suitable time for the contest, and it has been suggested that it run instead over the last weekend of the Ross Hull Contest. These options plus any others should be published in "Amateur Radio" for comment.

The Field Day has suffered from lack of formal recognition and has been run as a "trial" for three years now. This uncertainty has made it difficult to publicise the contest adequately, and is the major reason for lack of general awareness of the contest this year.

RECOMMENDATIONS

(1) That Federal Council formally adopt the VHF-UHF Field Day as a regular part of the WIA's contest program.

(2) That scoring based on locater squares be retained, but that band multipliers be the same as those adopted for the Ross Hull Contest.

(3) That the Field Day be better publicised in future, and that the Awards Manager be asked to consider nominating it as an "activity period" for the Grid Square Award.

As this is not a contest conducted by the "Federal" coordinator, perhaps the best way to handle this would be to allow it to come under the auspices of the Ross Hull Co-ordinator by "recommendation".

John Martin VK3ZJC

ANNUAL REPORT FROM FEDERAL AWARDS MANAGER FOR 1990

I have now been in the position of Federal Awards Manager for just under a year and it has been somewhat of an uphill climb. The amount of mail that is coming is increasing. I have slowly been getting things more organised but this will take time.

I took two weeks off over Christmas and spent one full week just catching up on answering letters and issuing awards. My only regret is that I get very little time these days to turn on the radio.

During this period I have put together the ground rules for the WIA Grid Square Award. I have also asked for input on two other new awards these being the Australian Cities Award and an HF version of the VHF Worked All States.

I have issued about 100 awards since taking over the job of awards manager and will probably double that this year.

Thanks go to Steve Gregory VK3OT who is now the DXCC Assistant to the Federal Awards Manager. Steve handles new DXCC's as well as updates.

I would also like to take this opportunity to thank all those who have given me encouragement throughout the year and look forward to the next year.

Phill Hardstaff VK3JFE/FK1TS,
Federal Awards Manager

ANNUAL REPORT FROM FEDERAL QSL MANAGER FOR 1990

Another uneventful year has passed with no highlights to report. DX type operations occurred on Lord Howe by a number of operators, for a short period in each case.

Their home addresses have mostly been tracked down. One given in the Australian Call Book was Level 34 of a major Sydney Office Tower. Can you imagine a postman trying to find VK9NX on Level 34?

World Radio News, an overseas publication, gave C/o Japanese Consulate General at a Box number GPO Sydney, which is more satisfying.

The ongoing reluctance of DoTC to supply some calls of VK0 operators continues, and some back log of cards is occurring in the bureau. Cards have been received for operators that have operated years ago, and their whereabouts now are unknown. In all, not a very satisfactory situation.

The "pirate" station which operated as "VK0E" has been identified. Due to the poor CW sending, many cards were received for VK0E. However, it was found that the station was 4N0E.

And that concludes another year. Hopefully next year will bring forth operators advising the bureau of their operations and QSL destinations.

Neil Penfold, VK6NE
Federal QSL Bureau Manager

ANNUAL REPORT FROM FEDERAL EDUCATION CO-ORDINATOR FOR 1990

Activities this year have been rather less than in previous years.

There have been few requests for sample examination papers or CW tapes, and I have had no invitations to speak to meetings or groups. The usual liaison with DoTC has continued - I have attended Joint Meetings as appropriate and been in communication as the occasions arose. However, there has been less need for my intercession with DoTC this year as in many matters the Divisions are now working directly with the Department, particularly in respect to the mechanics of the devolved examination system.

I have been in continual touch with the Executive and have attended all Executive meetings. I have attended several local Conventions or Field Days. I have maintained the monthly "Education Notes" column in AR.

There have been a few written and telephoned requests for information or assistance from individuals or groups, and some discussion with examiners and Divisional representatives. In mid-year I surveyed all examiners on the DoTC list as to their views and feelings on the new system, and any improvements they had made to the programs or felt were necessary.

High Points of the year. The main feature of the year has been, of course, the eventual examination devolvement. The February 1990 examinations were the last to be completely run by DoTC. Most Divisions have now held several examinations under the new system, and the problems are being overcome. There is still a need for co-ordination of all the different needs

of individual examiners, and many of those involved believe that the time taken for accreditation of examination materials is excessive.

Theory and Regulations examination papers are being prepared to be accredited by DoTC as samples for distribution. Job specifications for the Federal Education Co-ordinator have been drawn up and approved by Federal council.

Low Points The main disappointment of the year has been that the devolvement has resulted in reduced contact with Divisional officers and with DoTC, with correspondingly reduced information flow. The devolved examination system does not seem to be moving as smoothly as we had hoped it would. Although many enthusiasts have given a lot of time, effort and financial resources, the comments that I collect are not all favourable. However, as often happens, the complainants decline to provide specific details which I can place before DoTC.

RECOMMENDATIONS

1. That each Division assess the examination system with a view to sharing experiences and advising each other of possible problems or solutions to problems.
2. That Divisions collect and record as much information as possible on candidate attempts and pass rates with a view to evaluating the devolved system in 1992.
3. That all information collected be pooled and analysed by the Education Coordinator in association with statistical experts.
4. That DoTC be urged to make every effort to streamline the procedures for accreditation of examination materials.
5. That DoTC be urged to participate in the proposed review of the devolved system in the light of the experiences of both the examiners and the Department over the two years.

Brenda M. Edmonds VK3KT,
Federal Education Co-ordinator

ANNUAL REPORT FROM FEDERAL HISTORIAN FOR 1990

The problem of difficulty in retrieval has been overcome in part by a re-organisation of the storage of any material which is bulky but is referred to only infrequently. I now have a small kit of material available to support talks or exhibits, and I can provide copies of reference material from 1914 onward on request without undue delay.

The most frequent request has been for copies of call sign listings from about 1923 onward, and for information about amateurs licensed before 1925. Most amateurs seem to regard "History" as being "before World War II", a symptom of the mean age of amateurs perhaps.

I have been able to return to the owners some of the material which has been on loan. This material has been a hidden problem, because even the most methodical historian could not maintain day-by-day records and list all loans as "not gifts".

The best acquisition this year was the ALARA history prepared by Mavis VK3KS, and donated to our archives by ALARA. We can hope that the next publication could be a history of women in amateur radio from Miss Wallace (Mrs McKenzie) on.

Although any material pre-1940 is welcome, the most glaring weakness in the archives is of specialist post World War II publications, eg "VHFer", which have national significance.

All historians have the innate problem of being unable to throw out anything at all. I intend to publish a list of surplus journals in Amateur Radio magazine this year - eg. 300 kg or so of 1930s QST, which deserve a good home.

The least satisfying aspect of the historian's role for me is not having the time or facilities to complete the themes which Max VK3ZS, was annotating. However his very many notes have been kept with the relevant journals and will be available for the next generation.

In summary, the archives have been maintained and partly reorganised, a wide variety of requests has been answered, and two talks have been given, but there have been no new plans or programs completed this year.

John W. E. Edmonds VK3AFU/ATG,
Federal Historian

ANNUAL REPORT FROM AMSAT-AUSTRALIA CO-ORDINATOR FOR 1990

1990 has been yet another busy year as many more Amateurs look towards the Amateur Satellite Service with an eye to using one or more of the 10 currently active Amateur Satellites with the promise of 2 new Amateur Satellites due for launch in the first 2 months of 1991.

Six of the 10 were successfully launched aboard an European Space Agencies Ariane 4 launcher on 22nd January 1990 at 01:35:31 utc. Two satellites, UoSAT-3(OSCAR-14) and UoSAT-4(OSCAR-15), were built by the University of Surrey group and are similar to the previous UoSATs, namely scientific and educational satellites with the exception of UoSAT-OSCAR-14 which has a general-access Amateur Packet Radio store-and-forward package similar to FUJI-OSCAR-12 but using 9600 baud AFSK. Unfortunately, UOSAT-OSCAR-15 failed shortly after launch and has not been heard of since that time. The other 4 satellites are known as MICROSATS (because of their size - 9 inches). Two of the Microsats, PACSAT-OSCAR-16 (AMSAT-NA) and LUSAT-OSCAR-19 (AMSAT-Argentina), have general-access Amateur Packet Radio store-and-forward packages, another Microsat known as WEBERSAT-OSCAR-18 (Weber State College in Utah) has a video camera imaging system and the fourth, DOVE-OSCAR-17, is an educational satellite with a Digital Voice synthesiser speaking messages and satellite telemetry in a number of different languages (this part had not yet been activated at 31st December 1990) but it has been transmitting its telemetry at 1200 baud AFSK in AX.25 packets on 145.825 MHz which can be easily copied by any station capable of working terrestrial packet. This transmission alone has introduced many newcomers to the Amateur Satellite Service during 1990.

The new Japanese Amateur Satellite FUJI-OSCAR-20 was successfully launched by the Japanese Space Agency NASDA on the 7th February 1990 at 01:33 utc and is an "enhanced" replacement of FUJI-OSCAR-12 which was decommissioned in late 1989 due to insufficient power budget. This new Japanese Amateur Satellite was be put into a much more favourable orbit and therefore has been able to support much more store-and-forward packet radio bulletin board service (PRBBS) and Mode J voice transponder activity.

Other events that occurred during 1990 that have seen an upsurge of interest in the Amateur Satellite Service included the Amateur Radio operations conducted by Ron Parise WA4SIR aboard the Space Shuttle Columbia on the STS-35 mission launched on the 2nd December 1990 at 0649 utc. Many Australian Amateurs had the chance to work Ron onboard Columbia by both voice and packet radio on 145.550 MHz receive and 144.950 MHz transmit. During this mission 3 Australian Amateurs (Gordon VK6IU, Graham VK5AGR and Art VK2AS) provided the radio link to enable many school children in the United States to talk to Ron onboard the Space Shuttle Columbia.

AMSAT-OSCAR-10 (without computer control) and AMSAT-OSCAR-13, the Amateur Satellites which provide world-wide communications on 145, 435, 1269 (AO-13 only) and 2304 (AO-13 only) Mhz bands continue to provide faithful service. The use of the Mode S transponder began in April 1989 which meant that many more Amateur signals are now appearing on the 2304 MHz band. There has been no further repeat of the computer software on OSCAR-13 failing during the last 12 months as experienced in 1989 due to extreme high energy particle bombardment caused by the high solar activity.

On the 7th, 8th and 9th of May 1990 I attended the first annual Phase IIID Experimenter's Meeting in Marburg, Germany (along with 23 attendees representing 9 different countries) to discuss the building of an "enhanced" replacement spacecraft for AMSAT-OSCAR-13. This was very much a "brain-storming" meeting to investigate all the various options for such a spacecraft and to give attendees the opportunity to register their interest both in providing manpower and finances for the project. On behalf of AMSAT-Australia and many interested individuals here in Australia I registered our desire to participate in such a project which were gratefully accepted. Therefore, I plan to attend the second Phase IIID Experimenter's Meeting to be held in Marburg, Germany on the 6th, 7th and 8th of May 1991 to ensure that the interests of Australian Amateurs are adequately represented at such an important meeting.

Also 1990 has seen the formation of an enthusiastic group based in Sydney, but with members from all over Australia, who plan to build AMSAT-Australia's first Microsat called VKSAT-1 planned for launch in a 1992/3 timeframe. The group plans to build a Microsat according to the AMSAT-North-America design but with an added Integrated Remote Imaging System (IRIS) experiment which will be wholly designed here in Australia. To help in dealing with governmental agencies the group has recently adopted the name of the "Australian Space Engineering Research Association".

To give the Federal Councillors some appreciation of the interest in the Amateur Satellite Service during 1990 AMSAT-Australia I received just over 1200 items (almost the same number as last year) of correspondence requesting information on hardware, literature and of course tracking and telemetry decoding software from

Amateurs and non-Amateurs (particularly school teachers).

The AMSAT-Australia monthly NEWSLETTER has increased its total number of subscribers since it started production in April of 1985 from 500 to just over 600 in 1990.

Finally, I would like to thank the WIA for its continued support of the Amateur Satellite Service via the activities of AMSAT-Australia and ask that the 1990 Federal Convention to recommend that the WIA strongly support the formation of an IARU Satellite Fund by whatever means are at its disposal and that the financial support for AMSAT-Australia be continued at the present level.

Graham Ratcliff VK5AGR,
AMSAT-Australia National Coordinator

ANNUAL REPORT FROM FEDERAL VIDEO CO-ORDINATOR FOR 1990

This has been another relatively quiet year for dubbing requests due to the same reasons as reported last year.

Not-with-standing this, the flow of requests has remained steady if slow and the new Sony VO-5040 U-matic Master Player has performed flawlessly through-out the year. Although I am happy to continue indefinitely to perform what I hope will be agreed is a valuable service, it is comforting to know that should ill-health or other reason oblige me to relinquish my office, now that the WIA owns the major equipment virtually anyone who has a VHS recorder could take over.

I am pleased to report that during the year several new titles have been added to the library What Satellites have to offer - VK5AGR

Amateur Satellites and Packet Radio - VK5AGR
AMSAT Ground Control - VK5AGR
How to survive in a Dog-pile - VK2DEJ
HF DX Seminar - Iris & Les Colvin
Making Friends on DX - VK2SG
The Gladesville ARC AUSSAT transmission of 14/11/1990
VK5 ATV Call-in July 1990

My thanks for all but the last of these to the Gladesville Amateur Radio Club and to the NSW WIA.

A complete listing was published starting on page 18-19 of the February 1991 issue of "Amateur Radio", together with instructions on how to order copies.

Once again I would urge any aspiring producers of Technical Videos to consider placing a submaster with the WIA Video Library so that the results of your work may be seen and appreciated by as wide an audience as possible. Please contact the undersigned for details and hints and tips on how best to go about recording a technical lecture.

Don't forget that the WIA Video Library exists to serve affiliated Radio Clubs, particularly those away from the big cities. If you are finding it difficult to find suitable speakers for your club meetings, check out the titles listed in the February 1991 "AR"; you'll certainly find something to interest your members there.

Finally, I should draw attention to an error in the pre-amble to the Video-tape Title listing in AR in both this and the previous year. Following the words at the start of the third paragraph "Here's how it works..." the next sentence should commence "Except for those titles for which the WIA does NOT hold a copyright license...". My copy contained the word "except" in both years and in both years it was dropped when printed with the effect of reversing the meaning of the sentence! No-one (including me) seemed to notice though!

John Ingham VK5KG,
Federal Videotape Co-ordinator

ANNUAL REPORT FROM FEDERAL TAPE CO-ORDINATORS FOR 1990

For a number of reasons, the 15 year practice of providing Federal News on a recorded tape for weekly Divisional news broadcasts, was discontinued in April 1990.

The weekly news from the Executive Office of the WIA was then provided to each Division in script form to be read on the Divisional broadcasts by the Divisional Federal Councillor, where possible.

However, the change in system did not bring about the benefits to the WIA that were envisaged. Therefore, as a result of repeated requests, the "Federal Tape" system of disseminating news from the Executive Office was reintroduced in late September 1990.

Preparation of the news scripts for a two news segment tape averages five man-hours. All news scripts are prepared by Bill Roper VK3ARZ, with the assistance of Brenda Edmonds VK3KT. The recording of the news segments onto the master tape takes about another man-hour, a task shared between Bill Roper and Ron Fisher VK3OM. The duplication of the tapes and dispatch to each of the seven Divisions takes another two man-hours, tasks carried out by Ron Fisher, and June Fox from the Executive Office staff.

All of us involved with the production of the Federal Tapes would like to thank those volunteer Divisional broadcast announcers and engineers who so ably assisted during 1990 in broadcasting the news from the Executive Office to WIA members.

Bill Roper VK3ARZ,
General Manager & Secretary

ANNUAL REPORT FROM GENERAL MANAGER & SECRETARY FOR 1990

The Executive Office, apart from providing administrative and secretarial facilities for the Federal Council and the Executive, exists mainly as a vehicle created by the Divisions to provide those member services, such as Amateur Radio magazine, Call Book, membership database and fee processing, Customs certification, etc., which can be carried out more efficiently on behalf of the Divisions by a centralised office.

1990 was another year of consolidation and refinement of existing programs and procedures, so that the Executive Office is now running more efficiently, and more effectively providing the services required of it. Costs have been kept down wherever possible. Improved accounting and membership programs have enabled detailed analyses of the cost effectiveness of individual projects or estimates of the possible effects of future changes.

Some of the major achievements this year include:-

Preparation of manuals for all computer operations;

Completion of a data base for DoTC communications;

Preparation of all Call Book reference material on disk;

Comprehensive analysis of membership trends;

Evaluation of recruiting schemes;

Publication of the 1991 Call Book;

Sale of the Cromenco computer;

Consolidation of the trophies to the Executive Office;

Purchase of Award plaques for Contests;

Office staffing, which went through several changes during the year, has now stabilised. The loss of Ann McCurdy through her illness and untimely death was keenly felt in the Office.

The staff currently consists of:-

Full time paid employee		
General Manager	Bill Roper	70 hours pw
Part time paid employees		
Assistant Manager	Brenda Edmonds	20.5 hrs pw
Book Keeper	June Fox	20 hrs pw
Membership Secretary	Chris Russell	18 hrs pw
Clerical	Margaret Allen	18 hrs pw
Contractors		
Managing Editor	Graham Thornton	19.5 hrs pw
Computer maintenance	Earl Russell	6 hrs pw
Volunteer workers		
Librarian	Ron Fisher	5 hrs pw

Bill Roper VK3ARZ,
General Manager & Secretary

ANNUAL REPORT FROM INTERNATIONAL TRAVEL HOST EXCHANGE CO-ORDINATOR FOR 1990

The International Travel Host Exchange (ITHE) is a voluntary scheme administered by the American Radio Relay League (ARRL) wherein interested radio amateurs are able to meet or host fellow operators from other countries. This is a free service, which is promoted by the WIA to its members.

During 1990 only two enquiries were handled by this office; one by an Australian amateur intending to travel overseas, and one from a Japanese visitor.

The total Australian membership is about 25. Countries with larger amateur populations have fewer ITHE participants, but that is no cause for complacency. Continued publicity at suitable intervals should improve the situation. It may be worthwhile mentioning the scheme and perhaps publishing a list of participants in the WIA Call Book.

Ash Nallawalla ZL4LM/VK3CIT,
Federal ITHE Co-ordinator

AWARDS

PHILL HARDSTAFF VK3JFE – FEDERAL AWARDS MANAGER
PO BOX 300 SOUTHCAULFIELD VIC 3162

Greetings all. To kick off this month, I would once again like to give a plug to the K1BV Awards Directory. I just received a letter from Ted K1BV advising me of the current charges for his Awards Directory. The latest edition carries details of over 1729 awards as well as a lot of application forms and different score sheets etc, etc. I have the 1989 edition and constantly refer to it. As I have said before, if you want to know what is available and from where to get it, get yourself a copy of this awards directory. Ted is also keen to hear from people who have new awards, so if your club etc has started a new award recently, I suggest you send a copy of the rules to Ted for inclusion in the next editions. Ted's details are:

Ted Melinosky
The K1BV Directory of Awards
525 Foster St
South Windsor
CT 06074-2936

The current charges are as follows:

For VK	air mail	$US25.00
	surface mail	$US16.00

Foreign currency accepted at current rates. IRCs accepted at $US0.50 each (ie 50 IRCs for air mail and 32 IRCs for surface mail). He will also accept money orders or bank drafts etc. The edition is 230 pages of 8-1/2" x 11" three-hole-punched to make it easy to add and delete pages.

IRCs again

Last month I gave a bit of a rundown on the new redemption rates for IRCs. Well, it seems that not everyone in Australia Post has heard of this. It would also seem that different Post Offices have been giving differing amounts for IRCs for years, according to the information I have come across. Well, I wish they would get their act together and be a bit more uniform on this one. My wife took some IRCs to a Melbourne Post Office and was told rather bluntly that they were worth $0.85c only. This is rubbish; they are now worth (to redeem, not to buy) $1.20, so don't take a cent less. I sometimes wonder why Australia Post bothers selling these things if it can't be civil to people when it comes to redeeming them.

I once went to a Post Office near where I work at 2pm only to be told "can't you come here with these things when it's not lunch time?" As you can imagine, I was not impressed. I had specifically waited until 2pm for this very reason, only to be told it was still lunch time! Well, I am sure there are many of you out there who have similar stories. If so, drop me a line and I will put something together to submit to Australia Post.

The Kenya Award

I have had a letter from the Radio Society of Kenya hanging around for quite a while, but have not had an opportunity up until now to include the details of it in the column. They only supplied a photocopy sample of the award, which looks fairly basic, but I would still like to get one if I could. The requirements are as follows:

— a total of 10 (ten) points is required
— a contact with a 5Z4 station which must be a member of RSK counts as two points. Only one contact per station is allowed
— a contact with RSK's club station 5Z4RS counts as four points
— modes — all modes applicable
— bands — all bands applicable

Submissions to be made as follows:

— Only contacts made after 31 December 1977 count
— submit certified list
— send 15 IRCs or $US8.00 banker's draft made payable to the Radio Society of Kenya by registered mail
CASH MUST NOT BE SENT
— address applications to: The Kenya Award
Radio Society of Kenya
PO Box 45681
Nairobi, Kenya

British Postcodes Award

A couple of months back I gave details of the British Postcodes Award. I wrote back to them and asked if they would send a sample copy of the award, which they did. So, here is a reproduction of it.

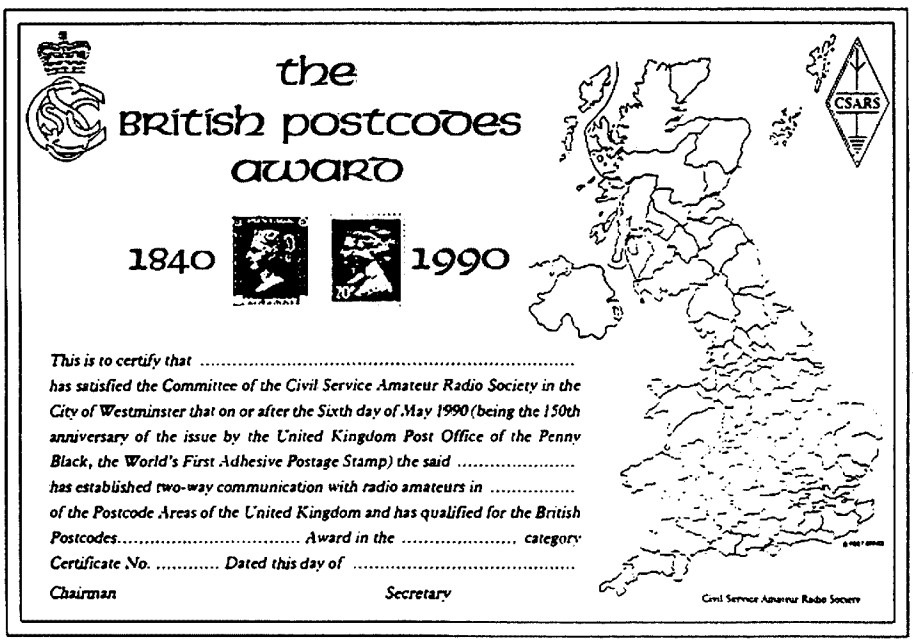
Jubilee Helvetia Award 1991

700th Anniversary of the Swiss Confederation

1. In commemoration of the 700th anniversary of the Swiss Confederation the Union of Swiss Short Wave Amateurs (USKA) issues the Jubilee Helvetia Award. Contacts made between 1 January and 31 December 1991, with stations using the special prefix HE7, are valid for this award.
2. The applicant must submit written proof of having contacted all 26 Swiss cantons. The cantons, preceded by their abbreviations, are as follows:

AG	Aargau
AI	Appenzell Inner Rhoden
AR	Appenzell Outer Rhoden
BE	Berne
BL	Basle — Country
BS	Basle — City
FR	Fribourg
GE	Geneva
GL	Glaris
GR	Grisons
JU	Jura
LU	Lucerne
NE	Neuhatel
NW	Nidwalden
OW	Obwalden
SG	St Gall
SH	Schaffhausen
SO	Solothurn
SZ	Schwyz
TG	Thurgau
TI	Ticino
UR	Uri
VD	Vaud
VS	Valais
ZG	Zug
ZH	Zurich

3. The award is issued in the following categories:



3.1 Contacts on any bands below 30MHz
3.2 Contacts on any bands above 144MHz
In each category, separate awards are issued for the following modes:

- Telegraphy/telephony (also mixed)
- Telegraphy
- Radioteletype (RTTY)
- Slow-scan television (SSTV)

Cross-mode and cross-band contacts are not valid.

4. All contacts must be made from the same DXCC country. The use of terrestrial repeaters is not permitted.
5. The submitted confirmations must clearly indicate the location (canton) of the station at the time of the contact. Confirmations of portable and mobile stations lacking information on the temporary location are not accepted.
6. Shortwave listeners may also obtain the award. The rules are applied analogously.
7. Confirmations must be accompanied by a list, showing for each contact the following data: own location, callsign and location (canton) of the station worked, date and time (UTC), band, mode.
8. Applications containing sufficient funds for return postage must be sent before 1 January 1994 to the award managers:

Bands below 30MHz:
Kurt Bindschedler (HB9MX),
Strahleggweg 28,
840 Winterthur, Switzerland

Bands above 144MHz:
Niklaus Zinsstag (HB9DDZ),
PO Box 651,
4147 Aesch BL, Switzerland

The Sherwood Forest Award

I received a letter from G0NZA with details of the above award, the rules of which appear below:

The Sherwood Forest Award is available to all licensed radio amateurs (on a QSO basis) and short-wave listeners (on a heard basis) who have worked/heard licensed radio amateurs in the County of Nottinghamshire.

The award is worked on a points system, and to claim the certificate a minimum of 30 points must be collected and are awarded as follows:

Five points for working/hearing the Mansfield ARS club callsigns of G3GQC or G1GQC

Two points for working/hearing any member of the Mansfield Amateur Radio Society

One point for working/hearing any other licensed radio amateur in the County of Nottinghamshire

All permitted bands and modes may be worked.

Each station may be entered into the log only once per claim irrespective of band or mode.

There is no time limit for starting or finishing the award.

A list of the current members and their callsigns of the Mansfield Amateur Radio Society may be obtained by sending a SAE to the Awards Manager (see address below).

A copy of your log entries of QSOs with stations in the County of Nottinghamshire should be certified by two other licensed amateurs and sent to the Awards Manager of Mansfield ARS along with a fee of two pounds, $4 or seven IRCs.

All claims and queries should be sent to:
G W Lowe G0NRA
Mansfield ARS Awards Manager
25 Manor House Court
Kirkby in Ashfield
Nottinghamshire
NG7 8LH England ar

CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CO-ORDINATORS)

VHF-UHF Field Day 1991 — Results

This Field Day was not very well supported, possibly due to the lengthening of the Ross Hull Contest, and the fact that it was not well publicised. However, this contest is a worthwhile activity that should continue. Next year it could also receive a boost from the new Grid Square Award.

Results

In this table, the first figure is the QSO points, including the band multiplier, and the second figure is the number of squares worked.

Congratulations, therefore, to the following winners, who will receive certificates shortly:

Section A	—	all bands	VK3ALZ
Section A	—	6m band	Nil
		2m band	VK3ALZ
		70cm band	VK4AIZ
		23cm band	VK4KZR
Section B		—Multi operator	VK3ATL
Section C		—Home stations	Nil

Some Comments

"Level of activity and awareness of the event indicates that much more publicity is required . . . stations in Melbourne are advantaged by the well-known squares boundary line passing through the city."

" . . . many people have holiday commitments . . . the easy way out is to have the Field Day coincide with the last weekend of the Ross Hull Contest."

New Year

As for dates, should we stick to the same weekend (especially if the Ross Hull Contest is shortened)? Alternatives could be the last weekend of the Ross Hull Contest, Easter or the first weekend in December (which is when the ZL Field Day is held).

It is felt that scoring based on locator squares is appropriate for this kind of contest, especially as Field Day contacts could be counted towards the new Grid Square Award. However, it is proposed to change the band multipliers so that they will be the same as those used in the Ross Hull Contest. Comments on these ideas, or any other suggestions, would be greatly appreciated.

Section			6m	2m	70cm	23cm	Total
A	VK3ALZ	I Berwick	—	138 x 11	—	—	1518
A	VK3CY	D Clarke	—	108 x 10	—	—	1080
A	VK4AIZ/2	D Friend	—	38 x 2	36 x 1	12 x 1	124
A	VK4KZR	R Preston	—	8 x 2	12 x 2	12 x 2	64
A	VK3TFE	H Szapirko	Check log				
B	VK3ATL	Geelong ARC (1)	90 X 20	178 x 10	204 x 14	—	6436
B	VK5ZUC	(2)	19 x 7	58 x 9	44 x 5	—	875
B	VK7ZHA	(3)	5 x 4	28 x 6	12 x 2	—	212
C	No logs received						

(1) C Gnaccarini VK3BRZ, G Noss VK3HQ, B Abley VK3YXK, C Leone VK3BCL, K Asplin VK3DQW
(2) A Russell VK5ZUC, J Brayley VK5AJQ, A Raftery VK5BW, A Denton
(3) A Hay VK7ZHA, A Perkins VK7ZAP

Ross Hull Memorial VHF-UHF Contest 1990-1991 — Results

It will come as no surprise that six metres was the "band of the year" in the 1990-91 contest. Activity was higher than usual and there were a number of openings to ZL, JA and the Pacific, as well as within Australia. There was very little DX on the higher bands, with few contacts from eastern states into VK5 and none at all to VK6. There was little interest in the satellite section, with only one log received.

Contest activity varied from state to state, with most activity in the week from Christmas to New Year's Day. As usual there were far more active stations than the number of logs suggests. Logs were of a high standard. Some entrants nominated different days for different bands, and these logs were re-scored on the best seven overall days. I regret that the rules as published were not clear enough on this point.

Several logs were of particular interest:

- Peter Parker VK6BWI used a newly

completed QRP CW transmitter on six metres.

- John Edwards VK3YTV used eight bands, including 2.3, 3.4, 10 and 24GHz. His 24GHz operation appears to be a national "first". He wins the microwave section by default, but no doubt would like some competition next time!
- Gordon McDonald VK2ZAB, whose log includes several ZL contacts on two metres, and daily contacts to four call areas on two metres and 70cm.

Results

		6m	2m	70cm	23cm	13cm	M'waves	Total
VK3XRS	R Steedman	4296	948	700	252	—	—	6196
VK2ZGE/A	R Lear	4227	—	—	—		—	4227
VK4BRG	R Graham	2695	33	—	—	2	—	928
VK2BSD	C Palmer	2577	228	—	—		—	2805
VK2FLR	M Farrell	2409	177	45	—		—	2631
VK5ZMK	M Kilmier	1896	163	285	49	—	—	2413
VK2ZAB	G McDonald	—	1200	820	—	—	—	2020
VK3YTV	J Edwards	110	512	525	252	120	225	1744
VK3CY	D Clarke	—	882	690	—	—	—	1572
VK5AKK	P Helbig	38	585	550	329	—	—	1502
VK3ZJC	J Martin	126	420	445	350	—	—	1341
VK7ZHA	A Hay	270	1059	—	—	—	—	1329
VK3AFW	R Cook	—	642	580	—	—	—	1222
VK7ZAP	A Perkins	7	666	510	28	—	—	1211
VK3AUG	N Sallman	—	795	—	—	—	—	795
VK3ZUG	R Cowling	82	378	235	21	—	—	716
VK5NC	T Niven	106	261	125	28	—	—	520
VK4XA	S Coleston	512	—	—	—	—	—	512
VK4KZR	R Preston	—	183	290	—	—	—	473
VK3ANP	D Waring	327	—	—	—	—	—	32
VK3ATK	H Meallin	—	231	—	—	—	—	231
VK6BWI	P Parker	3	21	—	—	—	—	24
VK2FLR	M Farrell Section C, Mode B							20

The winners of each section are therefore:

Section A — Multiband VK3XRS R Steedman
Section B — 6 metres VK3XRS R Steedman
Section B — 2 metres VK2ZAB G McDonald
Section B — 70cm VK2ZAB G McDonald
Section B — 23cm VK3ZJC J Martin
Section B — 13cm VK3YTV J Edwards
Section B — Microwaves VK3YTV J Edwards
Section C — Satellites VK2FLR M Farrell

The overall winner — for the second consecutive year — is Roger Steedman VK3XRS. His name will be inscribed on the Ross Hull trophy and he will also receive a wall plaque in recognition of his achievement. The other winners will receive certificates. Congratulations to all.

Some Participants' Comments

"Thank heavens for the distance component of scoring! Chasing locator squares may work in Europe, but definitely not in Australia."

"Some openings have occurred which straddle the 2300-0100 timing; this allows some stations to get double points for the same opening on the same local day."

"I would like to see the rules unchanged. Previously I have not entered because of the need for seven consecutive days to be used, plus other factors which discouraged all but the most fanatical."

"The contest is simply too bloody long!"

"I enjoyed what little of the contest I did work and I believe you are on the right track with the rules."

"Activity in VK6 was very low. Many did not know it was on."

"Some stations have sat on this frequency (50.110) during openings . . . rare DX was about and missed because of contest stations."

"It is an enjoyable contest — people don't go overboard and are quite happy to have a chat."

Problems and Possible Changes Scoring

Distance-based scoring was approved and will be retained. However, most agreed that six-metre scores were far too high. Possible solutions include making six metres a separate section, or limiting the maximum score per contact. Several entrants also pointed out that the multipliers for 23cm and above were low considering the effort involved in getting on these bands, and the number of stations available to work.

The aim for next year will be to fix this imbalance so that no band — be it six metres or any other — has a commanding advantage.

Use of Calling Frequencies

Some stations objected to contest activity on 50MHz, especially on 50.110MHz. Most activity on the higher bands was also on calling frequencies. This often resulted in long periods of waiting for the chance to break in, and prevented some interstate contacts from being made.

One of the aims of the contest is to stimulate DX activity, but the purpose is defeated if DX calling frequencies are used as local nets! A possibility for next year would be to nominate preferred "contest working" frequencies, in the hope of moving much local operation away from the weak signal frequencies.

Length of Contest

The aims of the longer contest and seven-day scoring were to stimulate activity over a longer period, but to avoid the need to "live in the shack" for the whole length of the contest. However, most contest activity was between Christmas Eve and New Year's Day.

This may have been due to conditions, but a number of entrants felt the main reason was flagging interest. Many stations seem to have worked hard at the start to get seven good days in the log, then tapered off after that. It seems that most still prefer a shorter period of more intense activity.

Division into UTC Days

Comments were made that local time would be better than UTC days. Next year each "day" could begin at say 1800 UTC rather than 0000 UTC. This would also allow a full day's activity on the first and last days of the contest.

Conclusions

It is understood that no-one likes too many changes too often, but it is clear that several changes are needed. I can plead inexperience this year, but next year will be a different matter! A set of draft rules will be published in a few months' time, but, in the meantime, I would appreciate any comments on the possible changes described above.

RD Results: Corrections

VK5ZNJ NOT VK5ZNZ
VK6ANC NOT VK6ANZ
VK6AMB NOT VK5AMB
VK5UM in CW section, not phone.
VK6RF log received for CW section **ar**

HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

I met Roger Harrison VK2ZTB the other day, who is better known as the propagation forecaster on HF bands. His predictions are published regularly in *AR*.

Roger says that the solar cycle in 1947 was very similar to the behaviour of our present cycle. Solar cycle 22 started in September 1986 and had a rapid rise up to July 1989, when it peaked. Since that time the cycle fluctuated between 10 per cent of the upper and lower limits of that peak. Similar cyclic behaviour happened in 1947, except that the cycle peaked again later at a higher level, and had a long and gradual decay after the second peak. Roger expressed his hope that cyclical history will repeat itself and we will have a double peak during this present period. Let's hope he's right.

Christmas Island — VK9

Seven Japanese operators, having obtained VK6 licences, will operate as portables from Christmas Island in April for one week. The callsigns are (in brackets the home calls): VK6BFV/VK9X (JA0GPT), VK6BFX/VK9X (JH0CFK), VK6BFW/VK9X (JH0PCO), VK6BFZ/VK9X (JH0MHE), VK6BFY/VK9X (JE0VAX), VK6BFU/VK9X (JR0CGJ) and VK9AG (JR0BQT). QSLs to be sent to JA0GPT.

The Colvins — Burundi — 9U

During the past six months or so, Lloyd W6KG and Iris W6QL were travelling on their YASME expedition in the middle and southern part of Africa. We heard them operating from Walvis Bay ZS9, Malawi 7Q, Tanzania 5H3 and Mozambique C9. From 31 January they were operating from Burundi as 9U2QL and appeared regularly on various DX nets. QSL to YASME: Box 2025, Castro Valley, CA 94546, USA.

Ethiopia — ET

Ethiopia appeared on the bands at the end of February after eight years of silence. The operator is Jack, and he was heard on 14, 21 and 28MHz bands. His signals were not strong in the beginning, but improved after he was able to erect his beam. A few VKs worked him on the "222" net. Jack said he has waited for three years for the issue of his licence and, according to ARRL sources, his activity "looks good"for a DXCC approval. He is expected to be in Ethiopia until the end of April. It is interesting to note that one day he was not able to come up on the band because his neighbour was "suffering" from TVI. Amateurs apparently have this problem even in Ethiopia. QSL to WB2WOW Peter D Uberto, 625 Ratzer Road, Wayne, NJ 07470 USA.

Clarion Island — XF0

This island is in the Revilla Gigedo group of islands off the west coast of Mexico in the Pacific Ocean. The station XF0C appeared on the band on 22 February. The delay was caused by an accident, a broken leg of one of the members of the expedition, who had to be transported back to the mainland for medical attention. The expedition expected to stay 12 days on the island, and it is rumoured that it will seek a "new" DXCC country status. QSL to be sent to XE1BEF Hector Espinose Flores, PO Box 231, Colima 28000 Mexico.

Solomon Islands — H44

Since May 1990, the Solomon Islands are heard regularly on the bands. The resident operator is Al H44AP. An interesting picture emerges from one of his recent letters about himself and the conditions under which he lives. He is not only an interesting prefix to work, but also a very dedicated professional person as a lay teacher. His wife Barbara is also a teacher, and both work at St Joseph's Catholic Secondary School, 21 kilometres distance from the capital of the Solomons, Honiara. The school is located near "Red Beach" and "Bloody Ridge" of World War II fame, and is situated actually on the site of the former US military hospital. Let me quote to you from Al's letter, which makes interesting reading:

> We still recycle the plywood and steel left by the Americans, and it is used in various buildings throughout the school. We are most concerned about our proximity to "Hell's Point", about 500m away from the school grounds. It was an ammunition storage dump and still contains over 30,000 unexploded shells. From time to time the Australian Army and the Solomon Island Defence Force send teams to extract and dispose of the shells nearest the surface. Hardly a day goes by without one or two random explosions.
>
> St Joseph's is a National Secondary School, one of the few such schools in the Solomons. The students are highly qualified and represent less than one per cent of the potential secondary students in the Solomons. There are 300-plus boys and girls enrolled from form I through to form VI.
>
> A number of boys are interested in my amateur activities, and they visit the school from time to time to talk to people on this planet. They don't quite believe that their voice is travelling throughout the world until they hear their name mentioned by the ham on the other end.
>
> I have plans to set up a school club station when we leave, and donate my station equipment to the school. My present station consists of an ICOM745, a Butternut vertical and a G5RV dipole.
>
> Finally, we are located in a very lovely setting on Guadalcanal and would welcome visitors. We are not that far from Honiara and certainly not that far from Australia.

Here ends Al's letter. QSL to: Al Pearce, Box 11 PO, Honiara, Solomon Islands.

Interesting QSOs and QSL Information

Note: callsign, name, frequency, mode, UTC, month of QSO. ADAR=QSL info in previous issues of *AR*.

* 7Q7EC-14024-CW-2000-Jan-QSL to DF3EC: Achim Rogmann, Frankenstr 34 D-4190 Kleve, Germany.
* Z21GC-14012-CW-2040-Jan-QSL to: Brian Legg, Box 294, Harare, Zimbabwe.
* C56/G3VPW-14004-0800-CW-QSL to: J Wright, Reservoir Cottage, Redhill, Nottingham, Notts, NG5 8PE, United Kingdom.
* ZW6XWD-Doug-14023-CW-0900-Jan. QSL: via Bureau.
* 3A2LF-Claude-14033-CW-1920-Jan. QSL: via Bureau.
* 5Z4FM-Jim-14019-CS-1939-Jan. QSL to: Box 44007, Nairobi, Kenya.
* ZD8BOB-Bob-21245-SSB-2139-Dec. QSL to: Box 2, Ascension Island.
* V51KC-Jack-21219-SSB-0537-Dec. QSL to: Box 1232, Swakopmund, Namibia, 9000.
* FH5EJ-10Mhz-CW-2047-Feb. QSL to: F6EBA.
* T22L-14Mhz-SSB-1209-Jan. QSL to: DL5UF.
* 3DA0BX-Christine (YL)-21205-SSB-0521-Jan. QSL to: The Manager, Box 57, Big Bend, Swaziland.
* T30DP-Beiaiti-14226-SSB-1141-Jan. QSL to: The Manager, Box 560, c/- Marine Dept, Betio, Tarawa, Kirribati.
* V85EB-Brian-21205-SSB-0518-Feb. QSL to: VK2KFS.
* ST0DX-Dennis-14222-SSB-0545-Feb. QSL to: WB2WOW Peter D Uberto, 625 Ratzer Road, Wayne NJ 07470 USA.

From Here and There and Everywhere

Zbig VK2EKY advised that Mary Ann WA3HUP is not the QSL manager for his 7J6AAK callsign. In the January 1991 *AR* we incorrectly listed Mary Ann as a QSL manager for that callsign. Zbig made a video-film of his Pacific journeys, and he donated one copy together with some photographs to the video library of the VK2 Division. Many thanks Zbig.

Gray VK4OH advises of a future special event. The Hervey Bay Radio Club has obtained a special call for the month of August 1991, to coincide with the Festival of Whales held in Hervey Bay each year when the humpback whales arrive on their trip to the

south. There will be a special award. The callsign to be used will be: VI4HBW.

The correct QSL information of KD7P/K76 and KD7P/KH2 is: Bob Winters, Box 8265 MOU3, Dedeo, Guam 96912, USA, and not KA2XX as previously stated.

Neil VK6NE, the WIA QSL Bureau manager for the VK9 and VK0 callsigns supplied further QSL addresses. VK0TS goes to Trevor VK1TW, VK0LL collects his cards from Kit VK2LL. The VK0JV cards should be sent to VK4CJO: J van de Geyn, 32 Wetherley St, Geeburg, Qld 4034. VK9WB cards to be sent to: W Blanton, PO Box 6189, East Victoria Park, WA 6004. VK9ZLX is Peter VK8ZLX. VK2KGV/9 is now back at his home QTH.

The DX operation by VK3AWY on Cocos Island will be for seven to 10 days around 26 May 1991. Callsign used will be: VK9YJ. QSL to: VK3AWY.

"Murphy's Typographical Error" popped up in these notes in the February issue of *AR*. Zedan JY3ZH is not in Vanuatu (YJ), as every DXer knows.

During April, Monaco will be active on CW with the callsign 3A200SM to celebrate the 200th anniversary of the birth of Samuel Morse who invented the "morse code" still used today. He patented his method of dots and dashes in 1837.

Florence F6FYP and husband Sylvio F6EEM were active between 15-23 February from Cameroon as TJ1YL and TJ1CW respectively.

To commemorate the 100th anniversary of Ukrainian settlement in Canada, a number of special prefixes — VO7, VO8, VC1, VA1, VC9 — will be used by the Canadian amateurs during March and April. VA100U special-event station will be active on all bands CW and SSB. QSL to: VA1OOU via V3EIPR.

According to DXpress, the following callsigns were all pirate operations lately: TT8AK, 3A0AA, P5UU, FT8XT, TN6PG, TN6PG/D2, ZA0DX.

The callsigns VK9LM and VK9LA were used between 15 September and 6 March by DJ5CQ and Y21RM who were on Lord Howe Island at that time. QSL for all contacts goes to: DJ5CQ.

Karl DL1VU was heard operating from Canton Island Central Kiribati as T31AF at the end of February. He will be there for a number of weeks, as transportation to those islands is predetermined by the round trip of the boat.

Jim VK9NS is intending to leave for Bangladesh on 9 March. He received permission to operate SSB, CW and RTTY. On 2 May, he will arrive in Bhutan with Kirsti VK9NL for a second visit, as Bhutan is still required by quite a number of amateurs as a DXCC country.

The Afghanistan activity of YA0RR has been approved for DXCC purposes.

Frank VK1ZL has operated a special call VK1WCC on the occasion of the Seventh World Conference of the World Council of Churches. QSL to: VK1WP.

YY5P was a special DX-island expedition between 8-12 February to Patos Island. QSL to: YV5ARV.

Miki HA8XX and Eli HA9RE arrived in South Cook Islands after the Niue Island activity. Miki operated as ZK1XX, and Eli as ZK1XL. They were active from 14-23 February. The last five days of their stay on Cook Island were marred by continuous rain and wind, the sign of an approaching cyclone. QSL for the South Cook operation goes directly to Miki, to his homecall HA8XX.

As you have probably observed, there is no RTTY news in this issue. Syd VK2SG is on his annual holiday — mobile — and he is enjoying a well-earned rest.

Interesting QSLs Received

Last month I complained that there are no reports in this category of news. This month saw a deluge of cards, specially via the Bureau.

Note: W=weeks, M=months, YRS=years, FM=from, MGR=manager, OP=operator.

Direct cards received: J6LMV (3W FM OP), VP2EY (4W FM MGR), 6Y5DA (4W FM MGR), A22BW (5W FM MGR), 9M8WB (2W FM OP), 5B4SA (3W FM P), TG9AJR (12D FM MGR), S79KMB (3W FM OP), 9M600 (5W FM OP), PA3CXC/ST0 (9MO FM OP), C56/DL7FT (4MO FM OP), ZD9BV (10W FM MGR), ZD8BOB (6W FM OP).

Cards received through the Bureau: too numerous to mention in detail; over 80DX cards have arrived, some going back to QSOs two years ago.

Thanks To You

Many thanks for the information and assistance received from: VK2DID, VK2EKY, VK3DD, VK4CRR, VK4DA, VK4OH, VK6NE, VK9NS, H44AL, HA8XX, 7J6AAK, QRZ DX, The DX Bulletin and DXpress. Your support is always appreciated. Good DX and 73

Peter James VK3AWY will be operating from Cocos Keeling from 26 March through to 2 April. This operation will include the CQ-WPX contest. While on Cocos, Peter will be using VK9YJ as the callsign.

QSL for the operation is via his home call VK3AWY, which is correct in any callbook. Stations that QSL direct and include IRCs or postage will receive their cards from Cocos with a Cocos Keeling stamp.

Peter will be operating all HF bands from 80m through to 10m using an FL7000 linear amplifier supplied by Dick Smith Electronics, and he should have a good signal over most of Australia.

Peter will also be taking 6m equipment with him and will be listening for VK, as well as operating a keyer beacon using the collapsible Yagi that Steve VK3OT has lent him.

When not operating during the contest, Peter will call into the popular HF nets as well as operating on his own. Peter will also pay particular attention to greyline propagation on 80 and 40m from Cocos.

Albert Gnaccarini VK3TU **ar**

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169 MENINGIE 5264

Returning to the Real World

After several months in hospital and recovering from a further back operation, I am at present undergoing a period of rehabilitation at the Hampstead Centre, Adelaide, being taught various skills which will be of value to me at home and elsewhere should I remain confined to a wheelchair. I am grateful to those in charge at the Centre for the privilege of using their computer for the compilation of these notes which will now appear one month earlier than if I had been obliged to wait until returning home to use my computer.

I cannot produce the beacon list or the Six Metres Standings List, as these are locked into my computer. However, I can say that pending the publication next month of the updated Standings, that presently John VK4ZJB heads the list with (from memory) 70 countries confirmed.. More on this next month.

I am grateful to all those amateurs who have kept in touch with me, by telephone, letters, cards and personal visits (including one by private aeroplane) — I will try to contact you all in due course. I am indebted to the editor of *AR* for his understanding of my position, and not applying pressure for a resumption of these notes before I could satisfactorily handle them.

VK6 Beacon Information

Bob Blinco VK6KRC, president of the West Australian VHF Group Inc, has sent a brief note informing me of the present status of the VK6 beacons: all beacons are independently keyed and signing "VK6RPH Perth" followed by approximately a 30-second key-down period. 50.066 has on/off keying, 10 watts with a horizontal omnidirectional antenna. 144.460

has the same details as 50.066. 432.160 operates FSK with three watts and a horizontal directional antenna. 1296.480 is FSK with 1.5 watts, horizontal omni.

Other details: the 2m frequency has been changed to conform to W1A band plan for VK6 (formerly 145.000MHz). The six and two-metre beacons have been changed from FSK to on/off keying. The 70cm beacon has a temporary antenna — 2x15 element NBS Yagis, direction variable horizontal. All beacons are on air and temporarily located at Bob's QTH, 32 Beverley Place, Cloverdale, about 10km east of Perth. The 52.460 beacon is no longer on air. Thanks for the info, Bob.

QSL Routes

BT4AG via JA9AG; CE3BFZ Pedro A Barroso, Box 13312, Santiago, Chile; CE0DFL Marco Meza, Box 7, Easter Island, Chile; DU1JPN via JA1UMN; EA8/G3JVL via G3JVL; HZ1AB via K8PYD; KB6SL/CE3 Kevin Szot, c/- Citibank NA, Ahumada 48, Piso 2, Santiago, Chile; KC6GV via LA2GV; KC6CQ via VE3JDO; PY0FF via W9VA; TR8CA via F6CBC; V51E via K8EFS; V73AT via KX6BU, Kwajalein ARC, Box 444, APO San Francisco, CA 96555, USA; XW8KPL and XW8KVF via JA1UT; XX9JN via KU9C; XB0T via DL1SDN; ZB2EO John J Bautista, 47 Valiant House, VBE, Gibraltar; 4D3HSP OP:4F3BAA, Box SM217, Manila; 7Q7JA P/Bag 28, Mana Blabtyre, Malawi, Africa; 717RM callbook address; 9Q5EE via K1RH. Thanks to Japan CQ Ham Radio and Bob VK6RO.

Six Metres

A number of letters arrived during my stay in hospital, and these have been brought to Hampstead, and the following has been culled from them. In some cases the news is somewhat dated but, for the sake of the record, has been included. That which is late information is written at the end.

Ron VK4BRG advised in a letter dated 27/11/90 that there had been some interesting happenings during the month. 27/10: 0003 to 0010 four weak contacts to New Mexico; 0045 ZK3F Tokelau, QSL via JA1WHG. 0135 5W1XD; 27/10: 0059 N6XQ, K6STI; 4/11: 0049 9L1US; 0118 ZL2TPY on backscatter; 12/11: 0034 6W1QC 5X9; 17/11; 3D2PO worked 6W1QC, PZ1EE and heard the FY beacon, all when beaming over USA; 20/11: opening to Europe, scratchy contact with DK2EA; 24, 26 and 27/11 TE openings to KH6 and then JA. These plus some Es contacts within VK.

Warren ZL3TX has written to say the Christchurch six-metre beacon was recently re-located and fitted with an improved antenna which is program controlled. The beacon output is switched back and forth between favouring Australia and North America. The details are ZL3MHF on 50.043MHz at Christchurch, grid square RE66EN, ERP 80 watts. Reports would be appreciated to The Christchurch West Amateur Radio Club, PO Box 31-095, Ilam, Christchurch, New Zealand.

A card arrived in December from VK9LE (VK3OT) which listed a few details of contacts when Steve joined Peter VK9ZLX (VK8ZLX) for their Lord Howe Island DXpedition. Areas worked were 3/12: JA1, 2, 7, 8; 4/12: ZL1, 2, 3; VK1 to VK8 were worked for 100 QSOs, and these included VK6BE in Albany and VK6YU in Perth, about 4200km. Heard HL7GN working NI6E and XU1 Cambodia and FK8.

VK5 to Europe

It had to happen eventually and congratulations to those involved. During the morning of 5/2 Col VK5RO noted that VK4ALM and VK4BRG and possibly others were working to 6W1QC in Senegal on the west coast of Africa. Later that day he observed plenty of TV signals coming from the north-west, and backscatter signals from VK3. At 1100 he worked OH2TI at 559, followed by SM6, OZ7, OZ1, LA9 and OH5. Hugh VK5BC was also able to work these stations and, it is understood, at least VK3OT and VK3LK.

On 6/2 the band was open to JA, ZL, KH6 and many stations in VK. On 8/2 Col VK5RO called VK4ALM, then turned the beam and heard G3HBR and, for about 40 minutes from 1000, he worked PA2, PA0, SM7, OZ1, G3, and possibly LA9; all were on CW with signals between 559 and 579. Roger VK5NY worked SM, OH, OZ and DL on SSB. Col said the working of these stations was very selective as VK5ZMK and VK5AMK heard nothing, although they live not far from Col. The PA stations were strongest, followed later by OH. The only VK3 to be heard at the time was VK3OT.

Col commented that two sets of conditions apparently prevailed for the two dates — on 5/2 that spread of area was narrow at the European end and wide in Australia, with the reverse the case on 8/2. Also, there was very little TV on 8/2.

On 9/2 at 1238 Col reported hearing EL3D on 50.187. It appears that possibly it was from a ship and a harmonic from the 25MHz band.

Steve VK3OT certainly did not miss the opportunity to work to Europe. A brief letter advises of his many contacts which, for interest sake, are as follows: 5/2 from 1022 to 1120, SM6CUG, OH2TI, LA9ZV, F2AIA, DL9CA, OZ7DX, JA5CMO, SM6CKU, G3HBR, all on CW with signals mostly 559, but rising to 599. OH2TI at 5x9 and SM6DER at 5x7 were worked on SSB. On 6/2, Steve worked ZL3TY at 5x9 at 0155 and ZL3TIC 5x9 at 0200. 7/2: 0500 JA7ZMA beacon was 529, and at 0940 heard OH2TI at 519 on CW.

Steve's best effort was on 8/2 when, between 0913 and 1104, he worked the following, all on CW unless otherwise stated: DK3EG, DL8HCZ, G3SDL, DK6JL, ON4PS, PA3EUI (using a vertical dipole), SM7FJE, SM7AED, OZ8RW, PA0OOS, OZ8RW (SSB), PA0HIP (SSB), SM7SCO, PA0FM, G3WOS, G3FG, OZ1ELF, G3VFY, G4MHF, G4CCZ, G3HBR, G3NVO, PA3OIC, DL9AAL, PA2HJS, ON4AMX, OZ1DJJ, OZ1ELF, OZ1DJJ (SSB), SM7BAE, OZ1BVW, OZ6OL, SM7FJE (SSB), SM7FJE, DL8HCZ. TV was strong on 48 and 49MHz. That's quite an effort, Steve!

Bill Tynan W3XO/5 reports in QST's *The World Above 50MHz* that Richard G4AHM by last October had worked 92 countries on six, which illustrates what can be accomplished from Europe.

Closure

As these notes have been put together over a period of a couple of weeks, I have now been informed I may go home on Friday 1/3, after an absence of several months; home in time perhaps for some F2 propagation on six metres during March and April.

One of the final skills I have been taught at the Hampstead Centre is to drive a car using hand controls, which will be a great help to my overall mobility.

Closing with a thought for the month: "Teenagers were put on earth to keep adults from wasting time on the telephone." (From Funny Funny World).

73 FROM THE VOICE BY THE LAKE ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

As you are now doubt aware, I missed the deadline for this column for the first time last month. I have noticed over the past year that it is becoming more difficult to write, as I never seem to find the time to spend on the air — a common problem by all accounts.

Perhaps this is my subconscious asking for help and maybe some stories and input from readers. Any offers?

Results of the February article have been promising, indicating that Morse is not on the way out yet. I have sent out 24 disks full of Morse programs in less than two weeks! Thank you all for sending the return postage/package as requested.

Steven Merrifield VK3MBO also used his disk to send me some of his own Morse programs, which I am including now on the disk with Gary Bold's programs. Last time Gary sent me a disk he included a program called SKYGLOBE (just to fill up the disk) which is an absolutely fascinating astronomy program. Consequently I borrowed the local school's 10-inch reflector (that's telescope) and our family spent a week gazing at nebulae, clusters etc, to the detriment of radio yet again. Even though I managed to track what I thought was the MIR spacecraft through two passes.

Over the past couple of months I have received over 50 replies to my new licence proposal, and I will be forwarding the lot to the WIA for, I hope, some action. I hope that you will all support my efforts when the WIA asks you officially.

For my next trick . . .

How many of us remember those first hesitant steps in actually communicating using the code? Wasn't it a disaster? I would like to make available some information that will help budding Morsiacs to overcome the shakes and downright fear one usually experiences when going on air for the first few times. A few years ago I would have tried it in book form, but the market is too small to attract the interest of a publisher; so what about computer disk files?

If you are interested, and especially if you can offer suggestions, write to me with your ideas, experiences, methods of operating, setting up the shack etc, I will attempt to put together a 'handbook on disk' which can help to overcome the new operator blues. You can also contact me on packet, VK3CQ@VK3EEE.

I will at the same time run the 'handbook on disk' as a series in Pounding Brass for the benefit of those who don't have a computer.

We could eventually see a WIA membership package which includes a disk containing Morse learning programs, training documents, and if you can imagine it, even the full theory course, exams, regulations, licence applications, log book, QSL printing software, packet software etc, etc, etc. The mind boggles.

ar

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074
PACKET: VK5EA@VK5WI

Russian Satellite Update

HR AMSAT news service bulletin 054.01 from AMSAT HQ Silver Spring, MD February 23. 1991. To all radio amateurs:

New Birds Show Signs of Life

This turned out to be a banner week for the new satellites (RS12/13 and AO21). Mode A of RS-12 was turned on earlier in the week and the beacon on 29.408 was described as very loud. However, later in the week it was reported that there may be a problem with RS-12 caused by interaction with the Main Payload Cosmos 2123.

Ed O'Grady KE2VC was listening to RS-12 on Mode A and heard an inordinate amount of CW in the passband and, after listening for a few seconds, determined that it was in fact the unmistakable sound of navigation satellite signals. Upon retuning his FT-736 over to 150.000 (Cosmos 2123's frequency) discovered a perfect match! Apparently, the Nav downlink (which had not previously been observed) is getting in to the amateur 2M receiver. This appears to be reminiscent of a similar situation with RS10/11 and its parent, Cosmos 1861.

AO-21 Turned On Early

Peter DB20S reports that the AO-21 RUDAK beacon and RM-1 CW beacon were switched on around 2140 UTC on 22 February '91, six days earlier than expected. GEOS had stated last week it would not power up our equipment before 28 February. While waiting for the next UO-14 pass, Peter had his receiver on 145.975 when the squelch opened and he found RUDAK-2 transmitting 400 Bit/s PSK telemetry (AO13 format) on 145.983MHz with an extremely strong signal. The CW beacon on 145.822 was also on with very good signals.

Once software is uploaded to RUDAK-2, the RUDAK beacon will be switched to 1200 Bit/s PSK AX.25 (like FUJI, PACSAT etc) transmitting telemetry and short bulletins. The ROBOT modes and RUDAK MAILBOX RBBS will be switched on later after final check-outs. Watch the RUDAK beacon, UO-14, and ANS for further information.

Subject: MICROSAT UPDATE

HR AMSAT news service bulletin 054.03 from AMSAT HQ Silver Spring, MD February 23, 1991. To all radio amateurs:

New Version of PG

The newest PG.EXE (Y910207R) has been released and is called PG0207.ZIP. It is on UO14, CompuServe's Hamnet DL.5 and on the DRIG BBS under Microsat section (available to all AMSAT members). It will appear on AO-16 later this week and may be downloaded, though it will not be broadcast until file xAEO, containing PG0206.ZIP is finished in a few weeks.

This version of PG has a couple of fixes and enhancements which may help solve some of the problems people have been experiencing.

The main changes are:

— MALL OFF added to automatic configuration

— MON OFF before directory viewing (and MON ON afterwards)

— Same for utility menu

— Bug fixed to stop the screensful of ; (and erratic logins)

— Enhanced handshaking between TNC and PG when issuing commands. This should stop any instances where PG overruns the TNC during commanding. Perhaps this will stop the corrupted callsigns and (just seen once) corrupted LCALLS.

It is suggested that you check the operation of LCALLS and BUDLIST on your TNC. If reports from the field are all to be believed, some TNCs will monitor packets from UOSAT3-11 even with

LCALLS UOSAT3-12
BUDLIST ON

With MALL OFF and MCOM OFF, the above budlist setting should filter out all but the UOSAT3-12>BBSTAT messages. Check this in Terminal mode.

FO-20 PSK Modem Improvement for Microsat Use

by James Miller G3RUH 1991 Feb 19

Introduction

Some users of my 1200 bps PSK modem have commented that data recovery with the microsats is poor, difficult or, in a few cases, impossible.

Personally I have no problem whatever with my standard modem and standard FT736R, but persistent reports prompted further investigation.

Fuji-Oscar-20 and AO-13 (400 bps) generate "pure" PSK. That is, the carrier phase is either 0 degrees or 180 degrees, and nothing else.

SATELLITE ACTIVITY FOR NOVEMBER/DECEMBER 1990

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1990-							
097B	USA-67	15 Nov	USADeployed from STS-38				
103A	USA-66	26 Nov	USA	714.8	20279	19935	54.8
104A	COSMOS 2106	28 Nov	USSR	95.2	550	526	82.5
105A	USA-68	02 Dec	USA	100.6	845	729	82.5
106A	STS-35	02 Dec	USA	91.7	363	350	28.5
107A	SOYUZ TM-11	02 Dec	USSR				
108A	COSMOS 2107	04 Dec	USSR	92.9	442	414	65.0
109A	COSMOS 2108	04 Dec	USSR	89.6	339	196	62.8
110A	COSMOS 2109	10 Dec	USSR				
110B	COSMOS 2110	10 Dec	USSR	11h16m	19142		64.8
110C	COSMOS 2111	10 Dec	USSR				
111A	COSMOS 2112	10 Dec	USSR	100.7	818	774	74.1
112A	RADUGA 26	20 Dec	USSR	1443.0	35937		1.3
113A	COSMOS 2113	21 Dec	USSR	89.2	307	189	64.8
114A	COSMOS 2114						
	through	22 Dec	USSR	114.1	1442	1388	82.6
114F	COSMOS 2119						

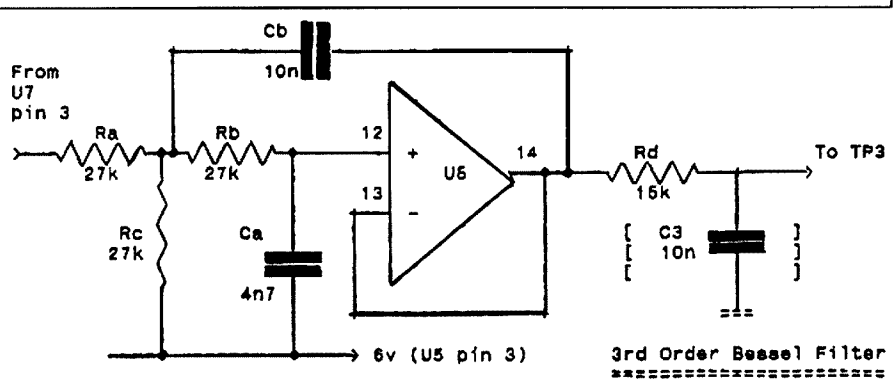
2. Returns

During the period 46 objects decayed, including the following satellites:

1985-018A	COSMOS 1631	08 Dec
1990-059A	BADR-A	08 Dec
1990-067A	SOYUZ TM-10	10 Dec
1990-085A	PROGRESS M-5	28 Nov
1990-087A	COSMOS 2101	30 Nov
1990-092A	COSMOS 2102	12 Dec
1990-098A	COSMOS 2104	04 Dec
1990-106A	STS-35	11 Dec

Notes

1990-106A STS-35 operated amateur radio through Ron Parisse WA4SIR.
1990-107A SOYUZ TM-11 docked with the MIR space complex on 4 December.
1990-067A SOYUZ TM-10 returned from MIR carrying two Soviet cosmonauts and a Japanese journalist. It landed at Arkalyk, Kazakhstan.
1990-085A PROGRESS M-5 undocked from MIR on 8 November and landed in the USSR.
Bob Arnold VK3ZBB



Note: 10n = 0.01µf = 10000pF) Use 10% or
4n7 = 0.0047µf= 4700pF) better

Extensive investigation shows that all three microsats (AO-16, WO-18 and LO-19) generate random phase noise. I (G3RUH) found peaks of +/-27 degrees on occasions with +/-10 degrees RMS scatter typical.

My modem, being designed "cold" and in wide circulation (1986) before FO-12 had even transmitted a packet, expected clean PSK. So its post phase detector (ie data) filter is an RC network R30/C3. This is entirely satisfactory for FO-20, but it hasn't really enough smoothing to deal comfortably with the microsat phase jitter.

The cure is to upgrade the data filter. There is a spare op-amp on the board, so by the adding just four resistors and two capacitors, a three-pole filter can quickly be implemented (15 minutes). The filter offers some 30db attenuation to the effects of excessive phase noise, and you'll get effortless 100 per cent data recovery from PACSAT, WEBER and LUSAT.

Application

This modification is for PCBs marked "JAS-1/FO-12 MODEM (C) 1986 G3RUH", issues one and two.

Circuit

Note that the existing R30 is removed, and the input of this circuit is from its left-hand hole, close to the legend "VR2". The existing C3 remains and becomes part of the new filter. The circuit uses a spare section of op-amp U5 so only six components Ra, Rb, Rc, Rd, Ca, Cb are new.

Construction

Ra, Rb, Rc, Rd, Ca, Cb are fixed to the underside of the PCB. Pin 14 of U5 is the pin nearest the legend "U5", and don't forget to link pins 13 and 14. Make sure that components and leads cannot accidentally touch PCB tracks.

Test — the "EYE"

Tune in a satellite as normal. Set the oscilloscope to 2v/div vertical and timebase 0.2 ms/div. Trigger from TP4 (1200Hz), and examine the waveform at TP3. You should see the characteristic "eye", with amplitude 6v pk-pk, centred on approximately 6v.

The TNC samples this waveform at the widest part of the eye. If it is above the midline, it detects a "1", if below a "0". So the quality and openness of this eye are a measure of detection robustness.

Don't Forget

Two points that are as important now as they ever were.

1. **Audio Carrier Frequency**: Make sure that you have the optimum audio carrier frequency. It'll be in the region of 1400-1700Hz (at TP1). Lock the modem on to a satellite at the start of a pass when doppler changes slowly. Look at the eye and VERY, VERY gently vary VR1. This will remotely auto-tune the radio up and down. Leave VR1 at the point where you judge the eye to be at its best; wide open and symmetric.
2. **Detector Threshold:** Input SSB radio noise to the decoder. Adjust VR2 for average mid-scale reading on the centre-zero tuning meter. Alternatively, set it for exactly 50 per cent of the 12v supply. It

should ideally be the same voltage as at the mid-level of the eye.

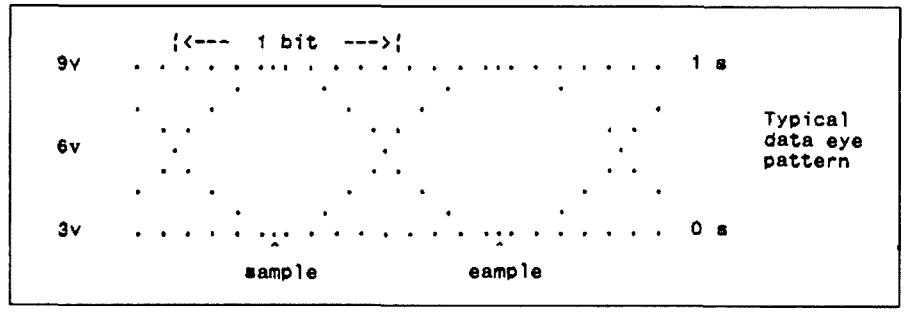
Thanks

Special thanks to VK5AGR, VK5HI, VK5ZK and G4WFQ for acting as testers to validate these findings.

Distribution

You are invited to circulate these notes on all appropriate BBSs.

73 de James G3RUH @ GB7DDX 19 Feb 1991 (Please note my new BBS)



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EMC REPORT

HANS RUCKERT VK2AOU EMC REPORTER
25 BERRILLE RD
BEVERLY HILLS 2209

1) Dr Ing Gerhard Blechert DL9TJ, DARC EMC expert, recommends: when a radio amateur intends to purchase an electronic appliance, he should ask the salesperson or manager to state on the sales docket that the equipment can be returned or exchanged should it prove to have insufficient immunity against legally permitted transmitter operation, or when it causes interference to short-wave reception. It may otherwise be very difficult or impossible for the radio amateur "to bring his own house in order".

2) Radio Communication, January 1991 (submitted by Norm Burton). "Is your own house in order?" By G3HB.

This very detailed report covers many steps the radio amateur should check, to avoid, or at least to minimise, any unwanted radiation, except the one via the transmitter antenna. Transmitter/transceiver harmonics: very strict standards exist in Germany. The coaxial or LC trap. SWR meter — some SWR/power-meter diodes generate harmonics. The low pass filter: some filters have capacitor self-resonances which cause attenuation gaps above 70MHz. Antenna tuning unit and π filter. Feeder radiation. Antenna resonances. Transmitter cabinet shielding and radiation from attached cables. The following test is recommended: connect a dummy load to the transmitter, run full power, and check the appliances (TV, VCR, HiFi gear etc) to see whether the transmitter has leakage radiation or whether the transmitter power goes only out from the antenna. Earthing is not always effective, especially at VHF and UHF. RF cable-chokes may be fitted with ferrite cores at power supply input and output ends. The EEC EMC standards after 1992 should teach manufacturers, dealers and salespersons, that the customer has the right to accept only appliances which meet these susceptibility standards. It is unfortunate that the attached EMC approval sticker on appliances does not always guarantee that the equipment actually meets the standard, as the Customer-Association (Warentest) found out in Germany. There could be several reasons for this, like fluctuation on production quality or manufacturer tricks. It is hoped that products with substandard EMC properties become uneconomical to produce, and that these are not sold in Third World countries where no EMC testing is carried out.

ERO-EMC '90 by G4JKS

(submitted by Norm Burton)

Electronic equipment manufacturers now have a new range of "test equipment" needed to check appliances and electronic equipment of all kind to see whether they meet the 1992 EEC EMC standards. It is strange that now some Hi-Fi gear manufacturers claim that they fear that some HiFi equipment may lose desired features if components have to be added to obtain EMC standard approval. They had at least 40 years to learn how to design their products to have adequate immunity. One of the early and very comprehensive publications was by the Remington-Rand Advanced Research Laboratory, Connecticut, USA. The writer had several long QSOs with the author, Phil Rand W1DBM, who was kind enough to send me two copies of his book "Television Interference", with publications from 1948-1954.

Transmitter frequencies for all services (including those for amateur radio) are allotted by the ITU world-wide and by national governments. It is up to the appliance industry to produce equipment which responds only to signals of the desired frequency, and has immunity against unwanted signals, being effectively selective. It will now be necessary not only for manufacturers but also for governments and other organisations (customs, consumer associations etc) to obtain EMC-testing equipment and to train operators in its use, to make sure that no illegal practice takes place. It is possible that some equipment only just meets the required EMC standard, and that by testing several units of the same model at random, the result may reveal some deficient examples. If, for example, the equipment starts to fail at 3V/m field strength in the test-cell, it is likely that it fails also at 2V/m. Well-known AQL (accepted quality level) methods should be used.

Doug Friend VK4AIZ submitted a paper: *New Scientist* December 1990 title: "Sensitive flowers of British HiFi may be trampled". This paper describes the same questions. Publications like this one should be made available to appliance importers and dealers, who may more readily accept and trust these reports on industry problems than the explanations from us radio amateur customers. The reader can see that the industry is now at last forced to accept the blame and has to do something about it. The radio amateur is no longer the only one blamed for reception *disturbance*, usually wrongly called *interference*, when lack of equipment selectivity, filtering and shielding (design shortcomings) are the fault. We radio amateurs can say: "We already told you so 40 years ago, and over 60 years ago as far as AM radio is concerned."

Several QST-EMC reports indicate that EMC standards are only very slowly accepted in the USA, but at least the FCC supports the not-guilty radio amateur when a neighbour starts court proceedings against the radio amateur, when he transmits a clean signal, when a below-standard appliance is affected. When local councils wish to restrict the antenna heights, they are being told that a higher beam antenna helps to overcome EMC problems in the neighbourhood. In Spain, it is a part of the transmitter licence to be also granted an effective antenna installation.

It can take a long time to replace popular — but wrong — beliefs by physics facts. ar

Help Stamp out stolen equipment - Keep a record of all your equipment serial numbers in a safe place

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

By the time you are reading this, the Gulf War may have already ended. I have been following developments on this conflict via shortwave, particularly from the BBC World Service on its numerous frequencies. As many of you are aware, the BBC has had to rearrange its program output at short notice to bring to the world the latest developments within the Gulf region. Another source that I have found is a feeder for the British Forces Broadcasting Service on USB on 12127kHz at 2030 UTC. It consisted of a news bulletin plus a relay of BBC domestic radio current affairs. This is presumably for British troops within the Gulf.

The long-awaited ground offensive in Kuwait finally happened on 24 February. It was a major operation, with the Allied coalition scoring some speedy victories over the Iraqis, thousands of whom have already surrendered. Present indications are that it will be a short time before Kuwait succumbs to the combined firepower of the Allied coalition.

I have been hearing numerous Arabic broadcasts also and, as I cannot speak or understand that language, I have had to rely on the current World Radio TV Handbook, plus some DX bulletins, to assist in identifying these particular broadcasters. Many of these have extended their Arabic programming because of the Gulf War. For example, Radio Abu Dhabi in the United Arab Emirates on 21735 and 25690 kHz from 0500 UTC.

Have you noted on the TV news the use of portable shortwave radios by troops in the desert? Presumably they are keeping in touch with news from home. These units are probably scattered across the Arabian deserts and out of range of the low-power FM stations which were set up specifically for the Allied troops. Also, there was a tremendous upsurge in sales within the USA of shortwave receivers, particularly after the Gulf Crisis erupted in January. Both of these do indicate the continued effectiveness of shortwave broadcasting, despite the instant images of the television newscasts.

It does now appear that Allied bombing did indeed put the Iraqi external senders out of action late in January. The Iraqi and Kuwaiti sites were carrying a common program until they went silent. The only shortwave signal that has been reliably reported is on the 90m band, plus an odd frequencyof 8350.3kHz. This is, of course, in the maritime allocation, and I presume that they pressed into service a marine transmitter to get the signal to the sites when the telecommunications network was entirely destroyed.

After the conclusion of hostilities, there will be scars within the region for some time. Therefore, it should be expected that shortwave broadcasting into the region will be increased so as to influence public opinion within the region and beyond. One problem has pointed out others that need attention if there is going to be peace in the Middle East.

Radio Canada International has suffered from a budget blowout of its parent network, the CBC. The future of the International Service is in doubt, at the time I write this. There has been talk of the Canadian Ministry of External Affairs taking it over, or funding its continuation. But indications are that if it does continue to survive, there will be cutbacks in languages and programming. One report was that it would be reduced to a relay of domestic English/French programming onto shortwave, similar to Radio New Zealand.

RCI has entered into agreements with several international broadcasters to share their senders. Deutsche Welle, the BBC, Radio Japan, Radio Korea, Austrian Radio, plus Radio Beijing, are the broadcasting organisations which have used the CBC Sackville site to re-radiate programming to North America. Conversely, RCI has utilised the senders of the respective organisations to get a stronger signal to their target audience.

Another relay base has been opened. This time it is Sri Lanka. Radio Japan recently opened its Ekkala site in the south of that nation, well away from the civil war there. Deutsche Welle has had a relay base at the Trincomallee, in the east of the country, and has been operating spasmodically, because it is right in the centre of the civil war. I can easily hear Radio Japan on 17820 from Ekkala at 0400 UTC. ar

ALARA

JENNY ADAMS VK3MDR
70 KANGAROO GROUND RD WATTLE GLEN 3096

Robyn VK3ENX met some of the VK5 girls over morning tea when she was in Adelaide in January 1991. L to R: Robyn, Meg VK5AOV, Jenny VK5ANW, Denise VK5YL and Sue Mahoney (XYL-VK5AIM).

Marilyn Syme VK3DMS and her sponsored 'twin' Merilyn Wright WA4NRX from Oakridge, Tennessee, when both were in Adelaide in February 1991.

When you regularly partake in nets you build up pictures of what the other people look like. So it is a real pleasure to meet the "voices on the air" when the opportunity arises as Robyn VK3ENX found out when she went to Adelaide earlier this year. Marilyn VK3DMS found this out also when she met her sponsored twin Merilyn WA4NRX from Oakridge, Tennessee, when they were both in Adelaide in February.

Mavis VK3KS was number 13 YL when she got her licence in 1939. ALARA and the WIA Federal Historian would be most interested to find out some information about the other 12. One of these was Florence McKenzie, the other 11?? If you have any information please send it to the

ALARA Historian
Marilyn Syme
PO Box 91
Irymple Vic 3948

Welcome to new sponsored members Sue ZL3AHT, Judith ZL3AGE and Irene GM0FTX. ar

FTAC NEWS

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

Acknowledgements

My thanks to all those who supplied updated information for the repeater listings in the February issue.

New VHF-UHF Records

Eight new records have been added to the list over the summer period. A new national 6m record has been set by VK8RH, breaking the previous record by nearly 200km. There is also a first-ever ATV record for the 13cm band.

6 metres:	National	VK8RH	to	8R1AH	18857.9km
6 metres:	VK2	VK2BBR	to	G3JVL	16669.7km
6 metres:	Digital modes	VK4KHZ	to	JH1WHS	7234km
2 metres:	VK1	VK1VP	to	VK4ZSH	936.4km
2 metres:	Digital Modes	VK3ZQB	to	VK3ZJC	268.6km
70cm:	Digital Modes	VK3ZQB	to	VK3ZJC	266.6km
23cm:	VK1	VK1VP/1	to	VK4ZSH/2	234.1km
13cm:	ATV	VK3YTV/3	to	VK3ZBJ	117.8km

EME Record Update

The current EME records have stood for some years and it is understood that they have been superseded. At present there are national EME records but not state records. All EME operators are invited to make new claims for both national and state records.

Mobile Record Conditions

A recent claim for a "pedestrian mobile" record was rejected on the grounds that it did not fit the mobile record criteria. A letter from Ed Penikis VK1VP has raised the issue of mobile records again. He poses these questions:

"What is really mobile? Can I drive my utility with a 2m dish mounted on it and claim a mobile contact? I understand that pedestrian mobile is not acceptable. Should we have only one mobile subdivision, or more, like: leg drive (pedestrian), wheel drive (car), chain drive (snowmobile, tractor), propeller drive (aircraft), wind drive (glider) etc?"

To claim a mobile record, the station must be installed in a vehicle and be capable of full operation while the vehicle is in motion. There are some provisos:

— The vehicle must be on land (temporary departures from terra firma due to potholes would be permissible). Snowmobiles would therefore be okay, but gliders would not. Hovercraft would fall into a grey area.

— The vehicle must be a vehicle. "Leg drive" would be in the home/portable category and not mobile. Horses are a marginal case — they go on legs but they are basically vehicles, and can carry saddle-mounted antennas. The same would apply to bullock drays and camel trains. Other specialist vehicles such as cherry-pickers would also be acceptable, despite the hazards attendant upon their use.

— The antenna would have to be either omnidirectional or able to be rotated by some means other than making repeated U turns. This problem would be of minor concern to Canberra residents, who could complete one over per circuit.

There is one loophole. Although the station must be usable in a moving vehicle, the vehicle need not actually be moving at the time of the contact, or even be capable of moving. This would allow the use of derelict vehicles, even including those with no engines. A person using an old railway carriage as a holiday home could therefore gain both home and mobile records for the one contact.

In this case we would have to judge the "vehicularity" of the station by its primary use. Hence the railway carriage would be in the home category, even if it were capable of locomotion. On the other hand, if the occupant of the carriage were in a wheelchair, he could satisfy the mobile criteria without having to go outside.

In any case, it is clear that stations claiming to be "home on a pig's back" will pose serious classification problems and may therefore expect some delay in the processing of their record claims. **ar**

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. All of the periodicals referenced below are held in the Executive Office Library. As a special service to **Members Only**, a photocopy of any complete article is available for $2.50 posted. To circumvent any copyright problems, please be sure to state - 'The information is required for the purpose of private study'. Address your request to 'The Librarian, Executive Office WIA, PO Box 300, Caulfield South Vic, 3162.'

Antennas – Switches

Mast-Mounted Antenna Switch. Paul Tait VE3ERK, *QSTVE* Jan 1991 pp 3 - 4. il diags, ccts. Two single pole change-over relays, mounted on the masthead, are arranged to provide a remote single pole three position antenna switch. A single pair of wires carries the 13.8V DC feed to the relays. The switch position is determined respectively by no voltage, or DC polarity.

– Yagi

Optimal Spacing for Yagi Arrays. John White VE7AAL, *QSTVE* Feb 1991 pp 3 - 4. il graphs. The theoretical 3dB gain obtained by stacking two Yagis side-by-side or vertically, will not be obtained if the two apertures overlap. Information is provided to enable the correct spacing to be determined from the known gain of each of the two Yagis.

Computers – Accessories

Hardware Display for a PC's Clock. Marko Severin and Peter Phillips, *EA* vol 53 No 1 Jan 1991 pp 162 - 165. il photos, cct and cmp. A plug-in board, suitable for IBM XT or AT, which displays a real time LED readout from the computer's internal clock. Kit is available for Aust$59.90.

RS-232 Interface for Decwriters. Peter Laughton VK2XAN, *EA* vol 53 No 1 Jan 1991 pp 166 - 168. il photos and cct. A low cost construction project to enable the obsolete, but reliable, Decwriter printer to be used with any computer having an RS-232 port.

Filters – Band Pass

A Diode-Switched Band Pass Filter. Doug DeMaw W1FB, *QST* vol LXXV No 1 Jan 1991. il photo, ccts. Remote switching of band pass filters is accomplished by switching a DC current through 1N914 silicon diodes. The circuit given is applicable to receiver front ends or SSB exciters.

Narrow Band Modes – Decoders

Listening Post II Fax/RTTY/Morse Decoder. Jim Rowe VK2ZLO, *EA* vol 53 No 1 Jan 1991 pp 80 - 84. il diag, photos, cct. A review of a kit designed by Tom Moffat VK7TM, which operates with IBM compatible computers.

Packet – Hardware

Packet Hardware for Beginners. Bruce S Hale KB1MW/7, *QST* vol LXXV No 1 Jan 1991 pp 20 - 23. il diag, photos and cct. An elementary look at the hardware requirements for getting started in packet. The wiring of a serial cable between TNC and computer is described in detail. Full adjustment detail is given for achieving successful results.

– Terminals

Low-Power Portable Packet Terminal. Steven Avritch WB1EOB, *QEX* vol 107 Jan 1991 pp 3 - 7. il photos, cct, pcb and cmp. A low-cost, do-it-yourself substitute for a PC terminal. Designed around a Motorola MC68HC705C8 single-chip microcontroller, the unit has a 40 x 2 line LCD display. Ordering information is given for a complete kit, costing US$75.

Propagation – VHF/UHF

Does Path Loss Increase with Frequency? Rick Campbell KK7B, *QST* - Technical Correspondence, vol LXXV No 1 Jan 1991 p 38. A mathematical discussion which concludes that the signals between portable hilltop antennas actually become stronger as the frequency of operation increases.

Power supplies –

Series Regulated

Regulated Power Supplies. Peter Phillips, *EA* vol 53 No 1 Jan 1991 pp 68 - 72. il diags, photos and ccts. An educational dissertation on zener diodes leading to fixed and adjustable three terminal regulators. A specific design is presented for a 2 - 20 V 1A adjustable regulated power supply, using a 317K IC regulator.

Switching

Switching Power Supplies for High Voltage. Timothy P Hulick W9QQ, *QEX* vol 108 Feb 1991 pp 3 - 9. il photos, ccts. A general outline is given for H bridge switching design. Enhancement mode MOSFETs are discussed, with particular emphasis on their role as controlled switches. A specific design is offered for a switched mode power supply suitable for high power linear HF amplifiers. This 100 kHz supply can deliver 1.5A at 2000V. The total weight of the equipment is less than 8 lbs.

Receivers – Characteristics

Effective Receiver Dynamic Range. Zack Lau KH6CP, *QST* - Technical Correspondence, vol LXXV No 1 Jan 1991 p 38. A discussion on how receiver sensitivity affects dynamic range. The Author considerers the effective dynamic range of a receiver to be the range between the system noise level and the loudest signals that don't create new (unwanted) signals above that noise level in the receiver.

Satellite Equipment – Modulators

Microsat Bi-Phi Modulator: Interfaces with any VHF TNC. John C Reed W6IOJ, *QEX* vol 107 Jan 1991 pp 10 - 13. il photos, ccts and graphs. The device is suitable for modulating an FM signal with Bi-Phi (Manchester biphase), necessary for uplink access to Microsats and the Japanese FO-20.

Technology –

Surface Mount Devices

A Surface-Mount Technology Primer - Part 2. Bryan P Bergeron NU1N, *QST* Vol LXXV No 1 Jan 1991 pp 27 - 30. il diags. A fundamental discussion of the construction, and the handling and soldering precautions necessary for passive SMD components.

Transceivers – Product Reviews

A New 2m FM Transceiver - 1. Jim Rowe VK2ZLO, *EA* vol 53 No 1 Jan 1991 pp 94 - 101. il ccts. The circuitry of a prototype kit transceiver developed by Dick Smith Electronics is examined in detail. This 5/25W kit covers the entire 2m band in 5 or 25 kHz steps with 24 memory channels; 600 kHz repeater offset is provided. With a nominal 13.8V supply, the equipment draws o.5A on receive and 6A when transmitting.

Kenwood TS-950SD MF/HF Transceiver. James W ('Russ') Healy NJ2L, *QST* vol LXXV No 1 Jan 1991 pp 31 - 35. il graphs, photo. A detailed report of the examination of this equipment.

– QRP

A Portable QRP CW Transceiver - Part 2 (Transmitter half). Gary A Breed K9AY, *QST* vol LXXV No 1 Jan 1991 pp 17 - 19, 23. il photos, cct. A 5 watt 20 m transmitter is described, using a MRF475 transistor in the final. Integrated circuits are used, together with discreet transistors. Full construction details are given, including coils and transformers. The alignment procedures are described. All harmonics and spurious emissions are at least 40 dB below the fundamental output.

Transmitters –

Frequency Synthesizers

HF Frequency Synthesizer...Easier Than Ever. Pierre Boillat HB9AIS, *QEX* vol 107 Jan 1991 pp 14 - 15. il photo and cct. Circuit is based on new Motorola LSI IC, the MC145163. The circuit covers the frequency range 4.5 - 9.999 MHz in 1 kHz steps. Finer frequency control is possible using an optional VXO also described. Any VCO may be used, but the Author has chosen a Colpitts for stability and low noise. The frequency may be lowered to include the 80m band by adding a few turns to an inductor. Cost of parts is quoted at about US$20, and it is claimed that only 3 or 4 hours are needed for construction.

Glossary of abbreviations

il	The article contains illustrations, a list of which follows.
cct	A circuit diagram
cmp	A component layout drawing
EA	Electronics Australia
diag	A mechanical drawing
pcb	A master drawing from which printed circuits may be produced
QSTVE	QST Canada
VCO	Voltage Controlled Oscillator
VXO	Variable (frequency) Crystal Oscillator

The above items are reproduced from *Amateur Radio Technical Abstracts* Volume 1 1991 ISSN 1036-3025 - to be published. **ar**

BOOK REVIEW

STEPHEN PALL VK2PS
PO BOX 93 DURAL 2158

The DXCC Companion: How To Work Your First 100 Countries

One hundred and twenty-four pages, soft cover. Published by the American Radio Relay League (ARRL). First edition 1990.

This book will be a great help for those who want to find out more about the "mysterious" DX world. Even the "oldies" of DX will find this book a useful tool and companion — as the title properly suggests — in their quest to conquer the 320-odd DX countries. The book is written by Jim Kearman KR1S in a bright and humorous style, and it takes the reader through the various steps to become a knowledgeable person. Whilst it does not cover absolutely everything about DXing, it talks about antennas, equipment, the use of double VFOs, split-frequency operation, morse keys and keyers, DX log-keeping, country prefixes, DXCC countries, foreign language phrases, QSLing, pile-ups, DX-nets and list operations, DX newsletters and many other subjects which are an advantage for the DXer to know.

It is a useful book for the beginners and for everybody else who has some interest in long-distance communications via amateur radio. The America price of the book is $US6 plus postage. However, with the price converted into Australian dollars, and the cost of shipping etc, the local price becomes $12.

Before you rush off to place your book order directly with the ARRL, first contact your divisional bookshop. They either have the book or can order it in for you from their usual sources.

Pleasant reading, good luck and happy DXing. **ar**

Remember to leave a three second break between overs when using a repeater

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

Annual General Meeting

Members are reminded that the AGM for 1990/91 will be held at Amateur Radio House, 109 Wigram Street, Parramatta at 2pm on Saturday 4 May 1991. Proxy votes must be received at that address by 10am on the same day. The Annual Report and financial statements are contained in a booklet which is made available to members by either an insert to *Amateur Radio* or separate posting as required. The meeting agenda is included in the booklet, together with a QSL distribution card and the membership card for the coming year. There are also details of an offer to all financial full members of the NSW Division to be included in a draw for a two-metre handheld. An alternative draw is available to associate members.

QSL Bureau

Members are advised that the VK2 QSL Bureau is now back on line. A lot of cards were distributed at the Gosford field day. Postings have been made to some recently. There are still many amateurs who need to notify the Bureau about what is required for cards to their callsign. All communications other than OUTWARDS cards should be directed to the QSL Bureau, c/- PO Box 1066, Parramatta 2124. Only OUTWARDS cards should be sent direct to PO Box 73, Teralba 2284.

Dural

The VK2RSY beacon which operates from VK2WI at Dural suffered some antenna damage during winds last January. While repairs were carried out, the six and two-metre systems ran on temporary vertical antennas. The 70cm fed into a horizontal Yagi pointed north. The original antennas are being repaired and may be back in service by now . . . The Dural driveway which was washed out has been reconstructed . . . Please note: the construction of the six-metre VK2RWI repeater is still under way. Amend the reference in the callbook and February data section to read L or P. While on the six-metre repeater subject, the Repeater Co-ordinator Barry VK2AAB has received several club requests for an allocation. Most of these have been processed. Any other club or group seeking a six-metre allocation should direct its written enquiry to the Division at PO Box 1066, Parramatta 2124 or on fax to (02) 633 1525.

First Regional Meeting

The first meeting of Regional Co-ordinators was held on the Gosford Field Day weekend on the Central Coast. A lot of ground was covered. The field day attracted the usual large crowd. The Division conducted a WARC92 raffle which raised a couple of hundred dollars . . . The next country field day will be Port Macquarie over the June long weekend . . . In last month's notes a reference that the current Australian callbook was sold out. A few more have been obtained should you still need a copy.

New Members

The following joined the NSW Division during February. A warm welcome is extended to them.

A A Akhtar	VK2XVE	Marrickville
R S Beckett	VK2ABY	Roselands
W Bradwell	VK2TBF	Abbotsbury
J A Burgess	VK2XRE	Bathurst
I B Egerton	Assoc	Lidcombe
M Keskin	VK2KDN	Lidcombe
M Matiszik	VK2SK	Bathurst
M C Riley	Assoc	Coonabarabran
W Shand	VK2AXW	Wahroonga
J R Simon	VK2XGJ	Dapto
M Stofmeel	VK2MJZ	Wauchope
G M Uren	VK2NBF	Coogee
P van Gemert	VK2ALL	Bathurst
D Williams	VK2XDW	Mayfield

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

Well, it's nice to have some good news for a change! We have a new broadcast officer; our VERY grateful thanks to Murray Burford VK5ZQ who has volunteered to take on the job. (I wonder if it had anything to do with the good write-up I gave him last year?!) We hope that you enjoy the challenge, Murray. If you want to contact Murray, his phone number is (08) 276 3393, and his address is 261 Belair Rd, Torrens Park 5062.

Unfortunately, Arthur Tanner VK5AAR has had to relinquish the publications officer's job, due to a move in his work situation. Rowland VK5OU has asked me to say thank you Arthur, on behalf of himself and council, for the time you did spend in the job. (I can vouch for Arthur's enthusiasm; he sold me a log book one month and tried to sell me another the next — he must get through log books quicker than I do!) Ian Watson VK5KIA has offered to take over from Arthur, for which we are also very grateful. Ian has also agreed to go to Federal Convention this year as our alternate FC. Bill Wardrop VK5AWM is, of course, our federal councillor. The Clubs' Convention will be held 24-26 May at Ridgehaven Primary School, and we hope all clubs will be able to send a delegate.

The WIA, Adelaide Hills ARS and Christine Taylor VK5CTY, have co-ordinated their exams so that there will be an exam somewhere in the metropolitan area *every* month. Here are the future dates.

27 April	WIA-SA Div
May (late)	Christine Taylor
29 June	WIA-SA Div
27 July	AHARS
31 Aug	WIA-SA Div
Sept (late)	Christine Taylor
26 Oct	WIA-SA Div
Nov (late)	Christine Taylor
7 Dec	AHARS (please note, this is early in the month)

Adelaide Hills ARS elected the following into office at its AGM on 21 March:

President	Geoff Taylor	VK5TY
Vice President	Don Nairn	VK5DON
Secretary	Alan Haines	VK5ZD
Treasurer	Bryan Trott	VK5PBT
Committee Man	Rob Gurr	VK5RG
Committee Man	Phil Day	VK5QT

Meetings are held on the third Thursday at Blackwood High School, 7.30pm, and visitors are always made very welcome.

Graham Ratcliff AM

Friends and fellow amateurs were delighted to learn that Graham VK5AGR, our federal AMSAT co-ordinator, has been made a Member of the Order of Australia, for his services to amateur radio organisations. Hearty congratulations Graham.

Now comes the news that another well-known amateur is also to be honoured. On Sunday 14 April, the Governor of SA, Dame Roma Mitchell, will present the Medal of Merit (a Scout Good Service award) to Don McDonald VK5ADD, at Government House, for his work with Scouts and Jamboree on the Air (JOTA).

Don was Project Commissioner for Scout Activities from June 1982 until March 1989, and during this seven years, the numbers participating increased markedly. Don was also responsible for a JOTA station at the 10th Australian Scout Rover Moot and the 15th Australian Jamboree, both held at Woodhouse in the Adelaide Hills. Don continues his involvement as Activity Leader in the Radio Activity Section, and with JOTA. Congratulations to you also, Don.

Diary Dates

23 April AGM 7.45pm
30 April Buy and Sell

Watch for future meetings. Topics are to include: Local Repeaters, NZ Repeaters and Ian Hunt VK5QX and his aerial erecting trip around the Pacific Islands.

VK6 NOTES

JOHN HOWLETT VK6ATA

During February the Peel AR Group held its second barbecue and get-together at the property of Alex and Mary at Lake Clifton. The event was good and deserves support; the numbers were down on last year due to a lack of advertising, and this will be addressed next year. To my knowledge this is the only country event in the state and serves to bring country and city AR operators together in a social group.

The Hills AR group will be holding a radioactive rally on 7 April and all are invited. The rally course will take you through about 50km of lovely countryside at a leisurely place, the questions will not be too difficult and will help you appreciate the area. At the end of the rally there will be a barbecue at the clubrooms situated on the corner of Sanderson St, Lesmurdie. Make this a family day out and have some fun, catch up with some old friends and make some new ones. Remember, this is a social event open to all operators and we hope you take advantage of it. Listen to the news broadcasts for full details or contact Fred VK6UR on 291 7360 if you have any questions.

The WIA AGM will be held on 16 April and if you can make it to the meeting, do so, as it is in your best interest. Eighteen members have nominated for the nine positions vacant, so please read the instructions. Fill in your ballot paper with care and return promptly.ar

QSLs FROM THE WIA COLLECTION (28)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

Guam — Hub of the Marianas

The largest of the islands making up the Mariannas and centre of the island group's commercial activities, Guam lies some 2000km of so east of the Philippines and about halfway between Australia and Japan. The island is about 50km long and about 13km at its widest part. There are tropical forests, a mountainous interior and beautiful reef-protected beaches. The Mariannas themselves are geographically part of Micronesia. This area takes in the East Caroline Islands, Marianna Islands, the Marshalls, Republic of Belau and West Kiribati (formerly the Gilbert Islands). The word Micronesia is derived from two Greek words meaning "small islands" of which there are approximately 2000.

The Mariannas were discovered by the Portuguese navigator, Ferdinand Magellan, in the year 1521 during the course of the first circumnavigation of the world. The explorer did not have a high opinion of Guam, naming it "Isla de los Ladrones" (Island of Thieves), since he thought the natives had stolen one of his boats which was being used to ferry fresh fruit and vegetables to his ships. The modern name, Guam, is derived from that given to the island by the native peoples who called it Guhan, a name appearing on 18th-century maps of the area. Although the explorer himself was killed by natives of the Philippines soon after leaving Guam, the reports of his discoveries of the Mariannas and the Philippines resulted in numerous expeditions by several nations. Magellan had renounced allegiance to Portugal and had sailed under the auspices of Charles V of Spain. It was this country that took possession of the island in 1565. Guam was to serve as an important supply station for Spanish trade between Mexico and the Philippines. Much of the culture of the indigenous peoples, the Chamorros, shows a strong Spanish influence, as does their native tongue. Even Guam's centre of administration, the Plaza de Espana, couldn't be more Spanish. Guam was ceded to the United States by the Treaty of Paris of 1898 which ended the Spanish-American War. Today a Trust Territory of the US, Guam is strongly American, with its hamburgers, bars, traffic rules and American currency. It remains an important strategic air and naval base for American Forces.

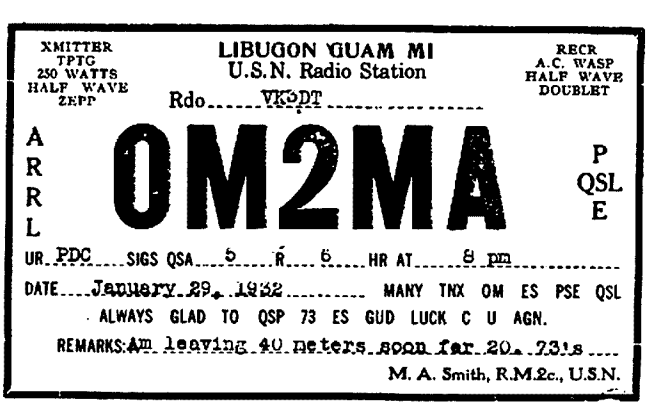
In the *Radio Amateur's Handbook* of 1927, Micronesia was shown as allocated the "intermediate" (precursor of the modern prefix system) OI, the first letter indicating the name of the continent, Oceania. (Australia had the intermediate OA at the same time). An asterisk after the OI was followed by a footnote that the allocation was "to be further partitioned when the activity warrants".

OM2MA

The first amateur station on Guam was said to be OM1TB which operated in about 1928. The OM itself was an "intermediate" made up of O (Oceania) and M (Mariannas). After intermediates were replaced by official prefixes on 1 January 1929, the external territories of the United States were allocated the prefix K. (Mainland stations were allocated the prefix W). Only some external territories were specified by a numeral which followed the K prefix (eg K4 Puerto Rico, K7 Alaska), but apparently activity from Guam failed to warrant a specific prefix. Guam stations carried the OM prefix despite the official K prefix allocation. However, in the latter part of 1935, the FCC (Federal Communications Commission) ordered all unlicensed stations closed. The term "unlicensed" may come as a surprise to many of today's operators, but in those days the numbers of unlicensed stations (especially in Europe) was enormous. Guam stations were shut down for two months until the new K6 call was applied for. There was some objection by Guam operators having to share the K6 prefix with Hawaii, since their countries were so far apart. Nowadays the old OM prefix is used by Czechoslovakian stations for special events. The OM2MA QSL shown was sent by a US Navy member to Val, VK3DT (now VK2VS) back in January 1932.

K6PMP

In 1932 Guam shared the K6 prefix with the Hawaiian Islands, but failed to warrant a


XMITTER TPTG 250 WATTS HALF WAVE ZEPP

LIBUGON GUAM MI
U.S.N. Radio Station

RECR A.C. WASP HALF WAVE DOUBLET

Rdo VK9DT

ARRL

OM2MA

P QSL E

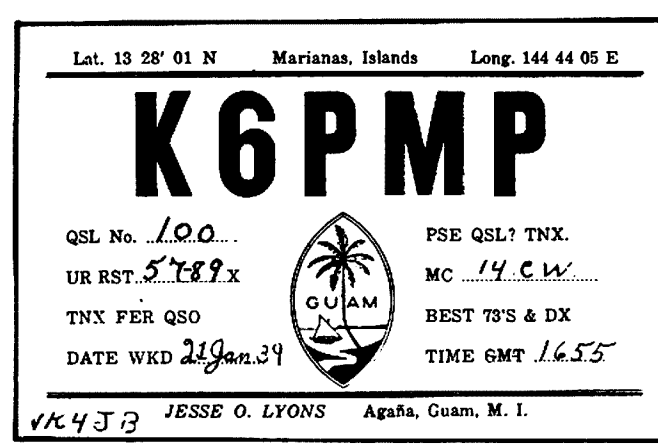
UR PDC SIGS QSA 5 R 6 HR AT 8 pm

DATE January 29, 1932 MANY TNX OM ES PSE QSL

ALWAYS GLAD TO QSP 73 ES GUD LUCK C U AGN.

REMARKS: Am leaving 40 meters soon for 20. 73's

M. A. Smith, R.M.2c., U.S.N.


Lat. 13 28' 01 N Marianas, Islands Long. 144 44 05 E

K6PMP

QSL No. 100

UR RST 5 7 8 9 X

TNX FER QSO

DATE WKD 21 Jan. 39

GUAM

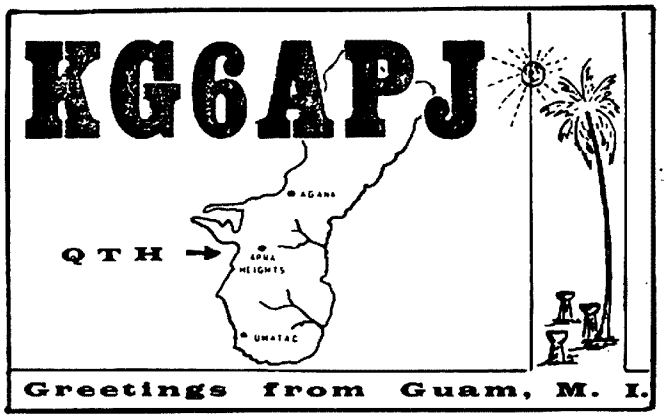
PSE QSL? TNX.

MC 14 C W

BEST 73'S & DX

TIME GMT 1655

VK4JB JESSE O. LYONS Agaña, Guam, M. I.



mention in some prefix lists of the day. Even up to 1937 some amateurs operating from Guam were using the old prefix OM. As explained in a footnote in *The Radio Amateur's Handbook* of 1936, this was an unofficial prefix. (NX = Greenland, and NY = Panama Canal Zone fell into the same category). Just before the outbreak of World War II, Guam was sharing its K6 prefix with Hawaii, Midways Island, US Samoa and Wake Island, but both K6 and OM prefixes frequently appeared in DX country listings. The K6PMP QSL shown was sent from Agana (the capital city and centre of population on Guam Island).

W9WUG/KB6

In 1938 a new prefix was allocated to Guam — KB6. The January 1939 edition of *Radio* presented a revision of the previous year's country prefixes with advice for the reader to note especially the new prefixes for the "Pacific Island Group". The KB6 (Guam) QSL is rather a rare card. The stations KB6CBN and KB6ILT were active in 1940 (America was not then at war). The W9WUG portable on Guam QSL is shown. It was sent to SK Cliff Pickering (then a short-wave listener) from the US 20th Air Force HQ. After the war, the KB6 prefix was taken up by the Baker, Howard, American Phoenix Group whilst Guam was allocated its KG6 prefix.

KG6APJ

In the September 1962 issue of QST, announcement was made of the addition of Guam to the ARRL Countries list. (Previously it had been simply one of the Mariannas Group). The prefix block KG6AA-HZ was issued by the FCC. Thus Guam and the remainder of the Mariannas (Rota KG6R, Saipan KG6S and Tinian KG6T) became two separate DXCC countries. It was in 1978 that the prefixes KH2, AH2 and WH2 were added to KG6 for the Guam listings, the KG6 prefix no longer being listed after 1986.

Guam authorities surrendered to Japanese forces on 10 December 1941. In fact, it was the first foreign territory occupied by the enemy. US forces landed on the beaches on 21 July 1944 and resistance ceased on 12 August, after considerable bombardment and savage fighting. The city of Agana had to be totally rebuilt. Nowadays, Guam is a busy commercial and tourist centre with modern shopping facilities and international standard hotels. Underwater diving in the warm blue waters and wind surfing are popular pastimes with tourists, as is duty-free shopping. Since April 1989, there have been direct flights by Continental Airlines from Sydney (and Brisbane) to Micronesia, travelling time being 10 hours. Although a valid passport is necessary, no visa is required by Australians for stays up to 15 days duration.

Thanks

The Wireless Institute of Australia would like to thank the following for their kind donation of QSL cards toward the WIA collection (supplementary list):

Austin	VK5WO
Ian	VK5NOT
Frank	VK2QL
Ivor	VK3XB
Mavis	VK3KS
George	VK3GI
Steve	VK3OT
Mike	VK6HD (donation of a complete WAS on 160 metres)
Jim	VK9NS
Jack	VK3CJT

Also the friends and relatives of the following "Silent Keys" (supplementary list):

Wal Ryan VK2TI (courtesy of W G Ryan)

Frank Maher VK3FZ (courtesy of Allen VK3SM)

Bill Butement VK3AD

John Traill VK2XQ

Len Wilson VK6LG (courtesy of Barrie VK6BR)

Col Chirnside VK3WQ

If any reader would like to contribute to the collection, QSL cards may be sent to: Ken Matchett VK3TL, Hon Curator, PO Box 1, Seville 3139 or phone (059) 64 3721 for consignment arrangement of cards. **ar**

CLUB CORNER

Moonta Scout Group ARC

PO Box 133
Moonta, SA 5558
24.2.91
Moonta Scout Group ARC

The Moonta Scout Group Amateur Radio Club will be operating a special-event station, VI5KL, during the Kernewek Lowender (Cornish Festival).

The Kernewek Lowender is one of the major festivals held in South Australia and is held in the Copper Triangle towns of Kadina, Wallaroo and Moonta from 17-20 May 1991.

VI5KL will be operating at Kadina on 18th, Wallaroo 19th and Moonta on the 20th.

A special certificate commemorating the event will be available for a small fee. Special QSL cards will also be available for contacts.

Operating times are 0030 UTC to 0830 UTC.

Frequencies to be used are:

SSB.3.590 MHz
7.130MHz
14.300MHz
21.190 & 21.300MHz
28.400MHz

FM 146.0 to 148.0MHz Simplex or via local repeaters. **ar**

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr Jim Brinkman	VK2IS
Mr E J Eastley	VK2VT
Ms Kath Smith	VK2ACP (2TY)
Mr J Howes	VK2DZS
Mr W A Faul	VK3AGZ
Mr Peter Fawcett	VK3APF
Mr R T McIntosh	VK3CIG
Mr W H Cure	VK7CV

John William Howes VK2DZS

Jack passed away at the age of 74 years on 28 August 1990 after a short time in Calvary Hospital, Sydney.

Active on the HF bands right to the end, Jack will be sorely missed by members of the Radar Net where he was heard each week without fail. Before World War II, he was well known in the Sydney radio trade. He also held a pre-war amateur licence VK2ABS.

At the outbreak of war, Jack enlisted in the Army Signals Corps, later transferring to the RAAF as a radar technician. Following a time in the field, he was appointed to the Radar Training School as a Sgt Instructor, later receiving a commission as a Technical Officer.

At the end of the war, Jack, with his own hands, built the beautiful home at Oatley which he and his wife Verna occupied for the rest of their married life.

Jack worked in the STC Valve Laboratory. Later he took up employment with the University of Sydney in the Department of Physics, where he spent most of his time with the team which designed and built the Mills Cross Radio Telescope at Bungendore, NSW.

In retirement, Jack was always busy in his Oatley workshop on electronic projects, which included the construction of a top-quality electronic organ, on which he became a very fine musician. Jack was always ready to share his technical expertise with others. We honour him as a brother-in-arms and a distinguished radio colleague. We extend heartfelt sympathy to wife Verna and family.

CHARLES HAMMER VK2DH
JOHN MARGIN VK4MX
FOR THE RAAF RADAR GROUP

Bill A Faul VK3AGZ

The death occurred on 17 February 1991 in Melbourne of "Bill" W A Faul, normally situated at 2/26 Fewster Road, Hampton, Victoria, after a short illness.

Bill was an old RAAF friend of mine from 1940, and we had been in frequent association with each other over the years. He originally came from WA where, before the war, he was closely associated with the Scout movement.

We had only just returned from a trip together to WA before Christmas 1990, and suddenly he was taken ill and is now a silent key.

Bill was a reliable friend over many years to a number of people and will be missed greatly.

FREDERICK J STIRK VK2ABC

Peter Fawcett VK3APF

Peter Fawcett VK3APF passed away in the Wangaratta Base Hospital on Monday 10 September after a short illness.

Peter was born in Melbourne in 1920, but moved with his family to Shepparton in 1937. After completing his education in Shepparton, Peter attended Pharmacy College in Melbourne, returning to Shepparton to work in pharmacy for 20 years.

He left Shepparton in 1969 to work in a pharmacy in Wangaratta for two years, before returning to his first love — radio — servicing communications equipment and TVs.

Peter was an early pioneer in VHF — all gear was home brew — and one of the few VHF stations in the Goulburn Valley area. The 10m band was his DX favourite. Peter will be missed by his many friends for his dry sense of humour and his wealth of knowledge and experience. Peter did not marry. We offer our sympathy to his sisters Pat and Judy and their families.

BRUCE GILLIES VK3AGG

Jim Brinkman VK2IS

Jim Brinkman passed away on 5/12/90. He was 78 years old. He had received his Amateur Operator's Certificate of Proficiency in Radio-Telegraphy (Certificate No 1425) on 12 February 1935.

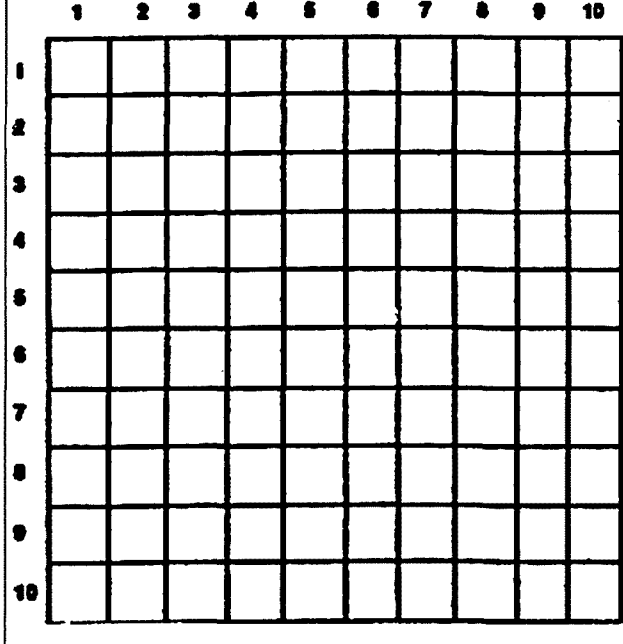
He retired OIC Coffs Harbour approximately 1975, continuing his active radio life with contacts from all over the world, until the last few months when his health suffered, and VK2IS was unable to continue and enjoy his love — Morse Code. He will be missed by his family and friends.

OLGA BRINKMAN

Mr R A C (Bob) Anderson VK3WY

Died Box Hill Hospital 26/11/90, age 83. Bob's introduction to amateur radio came when he and the late Bob Cunningham, who

Morseword No 49



Across
1 Keen
2 Felines
3 Boyfriend
4 Crimes
5 Young Katherine
6 Mist
7 Mink
8 Consumer
9 Girl's name
10 Slaps

Down
1 Use recklessly
2 Successor
3 Area
4 Go under water
5 Ends
6 Flower
7 Ode
8 Set of rooms
9 He's an odd .....
10 Frosts

Audrey Ryan © 1990

Solution Page 56

was also a chemist, worked together at Mt Lyell Laboratory. When this was taken over by ICI, Bob continued working there, holding a responsible position in the explosives section during the war years and subsequently in administration until retiring in 1970.

Although active on most amateur bands, he is best remembered for his service to amateur radio as Secretary of the Victorian Division for 17 years from the early 1930s to the late 1940s, having obtained his full licence and callsign in 1930. On retirement as Secretary, he was granted Life Membership, but continued with the Amateur Advisory Committee for some years.

He was also a member of RSGB and RAOTC, and was a member of the post-war Disposals Committee.

In latter years he was active on 160 metres with the coffee-break net, his last QSO being just two weeks before he died. His friendliness and many talents will be long remembered by all who knew him.

Our condolences go to his son, daughter and her family.

HERB STEVENS VK3JO

Ted Corton VK2BEE

Ted was born in 1933 at Surry Hills. He spent his early childhood at Dubbo where, at the age of seven, his father presented him with a Morse oscillator, sparking off an interest in radio.

At the age of 16 he embarked on his career as an apprentice with Stromberg Carlson in radio assembly and repair. Then, in 1954, he joined Masters TV as service manager; from there he started his own business in 1969, known as Corton's TV and Radio Service at Padstow.

As family commitments declined, he decided to move towards semi-retirement so, in 1978, he closed his business and joined the DMR as a tollway operator at Waterfall.

Ted was quite active, not only in electronics, holding experimental and broadcasting qualifications, but was also involved in gold prospecting, opal mining and the jewellery industry. Also building and flying gyrocopters for DCA approvals.

On 16 July 1990 Ted suffered a tragic heart attack. He will be sadly missed by his many friends, some stemming from the St George Radio Society.

Ted leaves behind his dear wife Shirley, daughter Cheryl, son Allan and grandchildren.

JOE VK2AJP

ar

HF PREDICTIONS. Due to late arrival of copy, we regret that HF Predictions is missing this month. Ed.

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

Code Not Only Problem

The discussions on the possible shift of CW speed for novice licence holders from 5wpm to 10wpm relate to me, too.

Although I can read 5wpm, with my writing hand that is my full-concentration top-writing speed. I agree that CW is an international language.

This is spoken of clearly, with illustrations of the brevity in message handling which relates, and comment that it is understood in the language of the receiving operator, regardless of the language the sender talks in, in the book *QTC*, by a retired marine radio officer.

Contrast the frequently imprecise message format which may relate to use of voice modes.

What is the place, especially in emergency communication, of the 'black box' modes when you have NO mains (or engine-room) power to drive computer or display, or to lock dish onto satellite and hold it on, or, say, when list on the ship prevents dish from accessing satellite, let alone locking on? Or VHF when maximum output is out of a 2W hand-held?

Ten words per minute for Morse is very likely, even after a year or two of better than once-a-day practice — say 20 minutes a session — at taking down 10wpm, to trim this K call back to a Z call, even with frequent examination during that time.

I have no doubt that practice at reading 10wpm random groups at LEAST twice a day would make it comfortably readable. But normal FAST writing speed for me is close on 5wpm, requiring FULL concentration on using pen and paper.

To those who sound as though they are assuming writing skills like I had when I sat for my novice, may I wish that you never come to discover that those writing skills, like my running skills, are a matter of history.

I hope that your technical and regulations knowledge can be demonstrated, conceded, using present-day testing modes, to allow you to continue in the amateur bands, should some disaster like that take place.

IAN CROMPTON VK5KIC
9 CRAIG ST
RICHMOND 5033

Exam "Rumblings"

The Tropical Coast Amateur Radio Club started in June 1989, and has been going successfully for the past 18 months.

In the first months, before DoTC resigned the reins of the exams, the club produced three novice calls. Since then we applied for examiner status, which the club received with VK4AVG Ted at the helm. More recently, the club has produced four sets of exams with successful applicants, some being from other clubs in the area.

Some local amateurs have said that the exams were too easy. I would like to state that the exams were properly conducted, were produced from the DoTC computer bank and were further approved by DoTC Canberra.

These rumblings are not what I thought amateur radio is about. I have found the exams hard, and have been examined four times. Each time I learn a little more. If these exams were easy, then why am I still a novice at time of writing?

So, please, no more rumblings, and let's get on with the hobby of amateur radio. It's comments like these which cause discontent.

Do you want these bands to become like the proverbial CB bands? If so, keep on the way you're going!

I find helping one another and being helped by someone is more productive, so let's get with it. I'm proud of my accomplishment; what about you?

Amateur radio for amateur people. Don't disgrace it!

ALAN MCCASKILL VK4LAM
C/- BOX 1155
INNISFAIL 4860

Misleading Advertisement

As you may well be aware, Realistic, through its Tandy dealers, is offering a 10m mono-band transceiver, the HTX100.

The rig offers an amateur with HF privileges the opportunity to work on an exciting band; however, the way in which Tandy has chosen to advertise this radio would quickly lead many people to believe that to "discover the fun of ham radio" is as simple as purchasing one.

Nowhere in their recent catalogue, where the rig is featured, did it once say that to operate the rig you require an amateur radio licence.

It is for this reason we need to pressure suppliers of amateur equipment to specify in the copy of the advertisement that it does require an amateur licence to operate the equipment.

SCOTT WATSON VK2JSR
"KALAGADOO"
LINDENDALE 2480

A copy of the recent advertisement was attached. Tandy says "The need for a licence is prominently displayed on the top of the carton and in the equipment handbook" – Ed.

Ten-Metre Piracy

It is often said that if we do not learn from history, we are doomed to repeat it, and such is the case with the pirate problem on 10 metres.

It is commendable that people are annoyed about it and want something done, but if cheap 10m units are imported to Australia *en masse* we are definitely going to see history repeat itself.

In the past, at least one retailer not only sold 27MHz equipment to *anyone*, but went out and actively promoted CB on 27MHz. Dealers like this are no friends of amateur radio.

If cheap 28MHz units are made available by profit-seeking retail outlets, they will be made available to anyone, not only radio amateurs, and we will have the same wholesale piracy that led to the loss of the 11m band.

There is nothing wrong with the idea of increased activity on 10m, but under the present legislation the importation of cheap CB-type equipment would be like trying to put out a fire with gasoline.

At the moment, the pirates are in Asia, not home.

People seem reasonably certain the modulation is AM, with poor stability. Could they perhaps be skirt-detecting FM?

European CB units are FM and operate in the 28MHz region; perhaps some have found their way to Asia.

JAMES ROBERTSON VK5KJR
PO BOX 557
NOARLUNGA CENTRE 5168

Challenge Old Ideas

Well, that's it! It's taken me five minutes to go through the February 1991 issue of *AR* when it should have taken me at least 30 (plus a little re-reading later on). Why, because it didn't have any (not one article) of the material that your own marketing research has indicated we require (in the same issue, I might add) viz technical articles, particularly those of a beginning nature. You say that the membership hasn't sent in any appropriate articles.

Well, let's look to overseas publications and borrow from same in large doses; verbatim, if we have to, in order to get the show on the road.

You say that's not *AR* policy. Well, let's change the policy; these are critical times. We need some lateral thinking here and to challenge past concepts that have served a previous era. Such an infusion of other ideas and approaches will probably stir the "creative juices" of our own contributors in providing appropriate additional articles.

We have to be "market driven" and provide what customers want first and foremost. I'm sure our *AR* readers would not object to this freshness in approach. Our advertisers (who are a little thin on the ground) would, I believe, also welcome a newness in approach with the marketing concept.

REG HARDMAN VK4XH
16 SUNNINGDALE AV
ROCHEDALE 4123

(Once upon a time AR *did contain numerous reprints from other society magazines. For many years now, we have not needed to supplement our VK contributors in this way. Perhaps, rather than challenge an old idea, we will soon have to adopt it! Ed)*

Fortress CW

Perhaps I expected too much from CW enthusiasts – the reaction to any suggestion of change is to defend to the death – what one might call the "Fortress CW" mentality.

I am not opposed to CW, nor am I a member of the dreaded "Anti-CW Lobby", however , I believe it is time for CW enthusiasts to accept a modicum of change – a little compromise in their own, and amateur radio's best interest – rather than defending Fortress CW till the walls come tumbling down.

I have previously suggested the compromise – CW as one of a small number of alternative topics for the Full Call.

Adopt this and you will cut the ground from under "Anti-CW Lobby" and be in an excellent position to promote the ongoing development of CW.

If you want to defend Fortress CW to the end, remember, when the fortress falls, as one day it will, you will find all will be lost, and this will be a sad thing.

As for VK2PA's comments, OTY Feb 91, re disabled people and CW – I trust I never read another letter like that in AR.

GRAHAM B JACKSON VK3TFN
PO BOX 39 UPPER BEACONSFIELD

Final comment?

Re: Morse Code Grizzles
Ho hum.

IAN STANLEY VK3CIS
PO BOX 70
ORMOND 3204

Parabolic Information?

I am interested in knowing what types of measuring devices are used in checking the measurement of parabolic curves such as parabolic dish antennas.

The Rayleigh limit states that little gain increase is realised by making the mirror accuracy greater than ± 1/8 λ peak error.

Are there any measuring devices that involve the use of an ink needle and graph paper chart and length of light pipe or fibreglass with a wheel to walk on?

PETER GUYER
"VALETTA" MSF 2281
MOREE 2400

(Can anyone help? Ed)

Translation Confusion?

"QSLs from the WIA Collection" is an interesting column and often unearths long-forgotten memories.

However, the February 1991 edition could cause VK3TL some embarrassment (perhaps from some quarters of ex-PAs and PKs now living in VK) as to his translation of PK1SCA's 1932 QSL. I agree, the card was badly designed, but the correct heading is: (first line) GENERAL HEADQUARTERS, (second line) "DE PADVINDERSBOND" RADIO DEPARTMENT. Location Bandoeng (Bandung), the site of the 1991 Region 3 Conference.

"Padvindersbond" means "Pathfinders ASSOCIATION", literally "Pioneers (or Scouts) Association". The Dutch language often has a number of (sometimes seemingly unrelated) meanings to the one word.

Finally, just a small item overlooked: The association was also a member of NIVIRA, the Netherlands East Indies Radio Society, which was formed in 1929 and officially recognised by the NEI Government as an incorporated body on 27 March 1931, ceasing operations in December 1949 with the independence of the republic of Indonesia. Note that, although the card states Bandoeng, Java, DEI, the official abbreviation was NEI.

Former NIVIRA members, now retired in the Netherlands and members of the PK-Club, will commemorate the 60th anniversary in April this year. No details are available at the time of writing this letter.

Keep up the good work Ken.

JOHN AARSSE VK4QA
PO BOX 211 NAMBOUR 4560

Brazil DX Net

I have been asked by PT7BI Daniel to help publicise the Brazil DX Net, and I thought perhaps the best way to do it would be by having its timetable published in our magazine.

I believe that there must be a number of stations interested, because, almost every day, I have "breakers" in my schedules with a group of personal friends in Brazil, from where I came 23 years ago.

I have asked them to come down below 21.200MHz sometimes, to give the novices a chance to participate as well. I still remember my "agony" when I was VK2NWD back in 1978.

The Brazil DX Net is run in the English language and follows the timetable below:

Day	Frequency	UTC Time
Mon, Wed, Fri	14.240	0900
Tue, Thur	21.270	0900
Sat, Sun	28.530	1200

They informed me they have "lined up" an ET station for the next weekend, but it is too late now; and, as for me, I hate DX chasing, hi hi! I am a "rag-chewer", definitely.

If I can be of any assistance, I am only too pleased to help.

T DE AGUIAR VK4BAG
20 ADELAIDE CIRCUIT BEENLEIGH 4207

HAMADS

TRADE HAMADS

● AMIDON FERROMAGNETIC CORES: For all transmitter and receiver applications. Send DL size SASE for data/price to: RJ & US Imports, Box 431 Kiama NSW 2533. (no enquiries at office please . . . 14 Boanyo Ave Kiama). Agencies at: Geoff Wood Electronics, Sydney: Webb Electronics, Albury: Assoc TV Service, Hobart: Electronic Components, ACT: Truscotts Electronics, Melb.

● AMTOR/RTTY/CW/FAX/SSTV software for PC's by G4BMK. AMTOR supports ARO, FEQ & listen modes $75, RTTY 40-110 baud Baudot/ASCII $50, FAX $50, SSTV $40. Full detials from Dave Ralph, VK4ASB, 23 Darwin St. ASPLEY Q. 4034 (07) 263 3872 A H.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution shortwave weatherfax, Morse & RTTY receiving program. Needs CGA, SSBhf radio & RADFAX decoder. Also RF2HERC, RF2EGA and RF2VGA, same as RADFAX2 but suitable for Hercules, EGA and VGA cards respectively, $35. SATFAX is a NOAA, meteor and GMS weather satellite picture receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, & weathertax PC card, & 137MHz receiver. $45. All programs are on 5.25" or 3.5" disks (state which) & documentation. Add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Qld, 4005. Ph: (07) 358 2785.

FOR SALE ACT

● Log Periodic antenna, suit VHF/UHF handles 100 watts. Australian made G.C. $140 VZ200/300 RTTY mod/demod KIT. Unassembled $50 Richard VKIUE QTHR Ph (06) 258 1228

FOR SALE NSW

● YAESU FT107 with FV107 ext VFO in GC any test sell $800 or exch. for IBM compat. with 20MB HD & disk drive also 45ft free std tower $400 or exch. for 2M gear or WHY VK2CWG QTHR (044) 76 1589.

● Kenwood TM201A 2 metre FM 25 watt Transceiver remote speaker and controller FC10 suitable mobile or base excelletn condition $450.00 John VK2ETT (02) 449 3135

● ICOM IC750 (similar IC751) txcvr, gen coverage rx, transmit audio often praised, VGC, $1500 ono. Yaesu FL2100B linear amp, GC, $750. Jim VK2PU QTHR. Ph: (065) 69 5361.

● KENWOOD TM2570A 2m FM deluxe tcvr 5/70 watts, keyboard entry, $500. IC701 HF tcvr digital solid state, no tx, $250. Kenwood MC60A mic, $85. Realistic PRO2020 scanner, $200. Icom RM3 remote control, $150. Pat VK2RZ QTHR Ph: (043) 62 1235.

● YAESU FT690R all mode 6m tx/rx c/w instruction manual and carton, $550. EC. Bill VK2NZ Ph: (043) 23 1286. QTHR. Licensed amateurs only.

● KENWOOD TS-940S txcvr 100W with auto AUTO, hand mic, manual and carton, EC, S/N 7030261, $3000. Steve VK2ASG. Ph: (02) 565 9730 BH, (043) 24 1542 AH.

● AEA PK232 with software, $450. Kenwood TR2500 h'held with charger and external mike, $300. Yaesu phone patch, $50. New Eimac 4CX1500B, $500. VK2OE QTHR Ph: (046) 25 8470.

● KENWOOD TS820S needs slight attention AT200 antenna tuner MC50 mix boxed, unused, spare valves, service manual, instruction books, $500 the lot. VK2AVT QTHR Ph: (02) 580 4325.

FOR SALE - VIC

● ICOM IC725 HF xcvr with AM/FM option board fitted. Less than 12 months old, still under warranty and in mint cond. $1300. Robert VK3TRB QTHR Ph: (03) 560 2891 AH.

● ANTENNA Emtronics 4-element Iriband Yagi HB 43DX all stainless steel, 6m boom, but can be shortened. EC with balun, $450 or offer. Peter VK3QI QTHR Ph: (03) 889 6396 AH.

● YAESU FT7, GC, $350. Transformer 240/32v @ 50 A with 3 heat sinks plus rectifiers, $125. Alum tube masts elements (used) cheap collected VK3YJ QTHR Ph: (03) 398 4192.

● KENWOOD R1000 general coverage receiver, EC with h'book, $425. Ron VK3OM QTHR Ph: (059) 44 3019.

● FT707 HF txvr in GC, narrow CW filter, manual, carton, mobile bracket, 100W O/P on HF bands including WARC, $550. Damian VK3EHP Ph: (053) 52 4183 QTHR.

● YAGI triband Hygain model TH3-Mk2 Thunderbird CW manual, $300. Stewart VK3NV Dromana Ph: (059) 87 3592.

● ICOM IC751 txvr incudes PS35 P/S, $1750 ono. ICOM IC275A 2m all-mode txvr, RX138-170, 35w o/p, $1300 ono. AQR2001 scanner, $499. Peter VK3YF Ph: (058) 21 6070

● ICOM IC202 2m SSB, $150, IC22S 2m FM, fault in PLL, $125, Ken KP202 with Nicads, $110, STC 151B on 2m, $80, Willis hi band solid-state 50w base, suit 2FM, $110. Ph: (054) 28 6309.

● ANTENNA Swiss quad 15m SQ15. $100. Laurie VK3DPD QTHR Ph: (03) 818 6009.

● YAESU FT101ZD HF txvr in VGC c/w DC/DC converter, fan, manual, $650 or swap for FT747 in GC with cash difference. Damien VK3EHP Ph: (053) 52 4183 QTHR.

● KENWOOD TS820S with ext VFO, VGC. New handheld UHF CB, also Seiko SC7000 scanner, all in VGC. Ph: (051) 99 2811.

● KENWOOD TS502S txvr in good working order. New finals, manual, Shure mic, $450. Dan VK3YIC Ph: (052) 26 2705 BH. Licensed amateurs only. (Serial No 640025).

● WESTON FM 661 UHF txvr. Marconi TF 2015 10MHz to 520MHz solid-state signal generator. Trio SG40C 100Khz to 30MHz solid-state signal generator. AWA 12v 10amp communications power supply. Unilab 12v 1.5amp power supply. Dick Smith rcl bridge. Marconi TF 893A audio power meter. AVO model 7 multimeter. Fluke 8010A digital voltmeter. All items in working condition. Best offer accepted. Also several misc circuit boards, cases, heatsinks and modules. Phone for list. (03) 764 7054 BH, (03) 763 0396 AH.

● ARA magazines, complete set, vol 1 to vol 9. The lot $60. Craig QTHR VK3CMC Ph: (03) 890 2117

● HP 606A handbook (copy), $10. R105A/B and R1051E handbooks, $50 ea. RCA CA3039 IC diode arrays, $2 ea. LSGII signal generator, $65. ARC R35A aircraft recvr 108 to 135.95MHz, 0.05 steps, with controller and circuit, $100. Macchi encoding altimeter, $75. David VK3BFB Ph: (03) 587 1593.

● BC221 Hetrodyne freq meter, manuals, $50. Vinton 2m transceiver, $50. Pair KP202 2m handheld & chargers, $150. Omega antenna noise bridge, $60. Nally tilt-over self-supporting tower, purchaser to remove, $500. Heavy duty rotator, cable & indicator, needs service, $300. Hi-gain stainless bumper mount, $50. KW Ezy-match tuner, $80. Q-craft SWR meter, $30. Ken VK3ASN QTHR (03) 842 5905.

● ARGONAUT 509 HF QRP tcvr 80-20m, c/w mic, hdbk & PSU. GC, $300. Microbee 128k Premium computer c/w colour monitor, twin disk drive, 5.25" software & manuals, disks, EC, $700. Monitor, green screen, hi res, GC, $100. Arthur VK3ENT QTHR (053) 32 8184.

● HEATH LINEAR amp 1000w with separate P/S metered and switched in four steps to 2000v full power. Uses Cetron 572Bs, $800. Monitorscope SB610 as new, $300. 572B valves, spare pair, clear, $220. Minilite headset in pouch, $20. TEN TEC Argonaut SSB QRP txvr with manual, $400. Voltohmist AWA, dial a bit faded, $40. Frequency Meter SCR221, AC and with all charts, excellent, $50. Advance audio generator, 300 cps to 50 kc. Type H, $50. Resistance Bridge (metered), $40. Telephone collection, Erricson to warship (write). HV transformers, suit linears (write). Drill press with 1/4 hp motor, $80. Grinders, compressor, pulleys, belts, etc, etc, $200 the lot. Power supply. Trimax/PMG 50/50 OR 65/65v, filtered DC. Many uses, but suits teletype, $35. ATV transmitter on 425.252 m/h. GEC commercial rack mounting with power supply to match, $120. TV camera, Philips, video or strong RF signal output. Schneider 1.4 lens gives high sensitivity, $200. TV receiver, B&W, AWA, 17" portable, excellent, $80. Glide or manual tone generator, sine or square waves, $40. Decoder, Morse and RTTY, new, unassembled D Smith kit of parts, $100. VK3DS. QTHR (053) 32 3226.

FOR SALE - QLD

● ICOM IC251 2m multi-mode base txvr, includes mic, handbook, w'shop manual, twin VFOs VGC, $500. Kenwood TR2600 & TR3600 2m/70cm handhelds and ST2 supply/charger, sell as unit, $800 PC. Ross VK4AMJ QTHR (AH) (07) 359 3308.

● VZ300 plus 16K Ram, print interf, RS232 terminal, for packet. Data recorder, manuals, ser no V189348, working order, $120. Gordon VK4KAL QTHR (079) 85 4168

● GOLDSTAR 20MHz dual trace CRO complete with probes. Ser no 81732, manual, as new, 30 hrs use, $600. Gordon VK4KAL QTHR (079) 85 4168.

● YAESU FRG7 SW receiver, works well, light corrosion on top of case, $150 VK4BIK Barry (074) 91 7317.

VALVES 572B T160L, new, unused, $350 the pair. Peter VK4APD QTHR (07) 397 3751 AH.

FOR SALE - TAS

● IC1271A, SN1339 in PC, with built-in PSU PS-25, manual and box, $1750. Will consider swap for good HF rig or linear. Frank VK7LO QTHR.

● TOKYO Hy-Power 2m Sagra 600 linear, never unpacked, requires pair 4CX250B valves and power plug for operations Weight 30kg, $1380 freight free. (003) 27 2256 Joe VK7JG QTHR

FOR SALE WA

● KENWOOD TS930S EC, no mods, workshop manual, mic, rarely used, ser no 3050166, $1900. Alastair VK6AES (09) 527 7238.

● SOLID STATE 2 30MHz linear amplifier 1000w output from 75w drive, $300. Weston SV16 handheld 2m txvr synth with 1W.5W. output, $550. (09) 444 0285 or (09) 242 3559 (BH).

WANTED - ACT

● FT102 digital/memory VFO. Realistic price paid for good unit. Richard VK1UE QTHR (06) 258 1228.

WANTED - NSW

● REYCO 40m traps, as sold by Scalar 1980s Balun also required. Ron VK2FLG QTHR (068) 28 1543 BH, (068) 28 1261 AH. Rev charges.

● COPY of operating and service manual for Eddystone 750 receiver. Also very old electrical apparatus, eg wood case meters, galvanometers, resistance box etc. Brian VK2EFD QTHR (049) 77 2178.

● FT101E txvr or similar, in GWC. Ron VK2BKN QTHR (069) 72 2021.

WANTED - VIC

● RSGB Radio Communications Handbook, not too old, not too much. David VK3NGD. (03) 859 4698.

● AIRCRAFT Altimeter in working order. Ian VK3YIC. (052) 26 2705 (BH).

● CIRCUITS operating instructions for a Rhode and Schwartz wavemeter, model WID 22MHz to 300MHz. Will pay photocopying costs. Bob VK3ERG. QTHR (03) 541 5458 BH.

● HP606A output term 11507A and fuse prot. 11509A TS323UR freq meter and DA-43U dummy load wattmeter handbooks. EA52 diode. Baretter Hivac XB1/ CVZ293. Collins KWM2 mic, mech filter, parts, 51S-1 choke, parts. 312B4 or 5. *Ham Radio* mag, Feb '75. David VK3BFB (03) 587 1593.

● RESISTANCE lamp type 1457 lor Philips battery charger, model 1453, circa 1929, or technical info of value of resistances. Ron VK3BRC QTHR (03) 819 3568.

WANTED - QLD

● RESTORING WWII B41 navy receiver 15kHz to 700kHz, require circuit and any details. VK4EF 97 Jubilee Tce, Bardon, 4065. (07) 366 1803.

WANTED - SA

● TEN TEC CENTURY 21, Argonaut 509, Shimizu SS105, Heathkit HW8 or HW9, txvr, can trade mint TS520 with CW filter. Urgently required. "Doc" VK5HP (086) 49 1956.

WANTED - WA

● CW SEND program for Ohio Superboard II computer. VK6BK QTHR (097) 95 7124.

● INTRUDER WATCH observers in VK6. Free tape, logs, postage and advice. Please help. Contact VK6RO, Graham QTHR (09) 451 3561.

● 2M RIG fault free; swap for pair unused 572B valves. VK6NE QTHR (09) 409 9333.

TAS - WANTED

● IC720A or similar, must have, GC, receiver, dead or alive. Pay to $700. Joe QTHR (003) 27 2256. VK7JG

IARU MS Summary for January 1991

Date	Time UTC	Frequency In MHz	Callsign If Heard	Mode	Logs X	Details of Traffic If Known and any Other Information
300191	1142	7048.5	UHF3	FSK		100H/Rev
030191	2100+	7060	—	R7B	9	
010191	1515	14001	4XZ	F1B	2	"VVV" de 4XZ
05191	0910	14007.9	—	J3E/L	3	3 stns on chan/Chn tfc
0519105	0515	14011.5	—	F1B	3	RTTY 1000Hz
050191	0915	14023.9	—	F1B	63	RTTY 250/100 24 hrs on air
250191	1030	14030	PKJ	A1A	12	Now works this freq or 14033
dly	mni	14048.5	_	J3E/L	66	Rad tele, 8-10kHz wide/24 hrs
050191	0916+	14051	—	J3E/L	14	Tele tfc in Asian language
mni	mni	14058	—	A1	60	"Helschreiber" (also on 10MHz)
170191	0950	14063	—	F1B	2	RTTY 1000Hz
mni	mni	14065	VRQ	A1A	48	5ltr code Vietnam
mni	mni	14070/5	VRQ	F1B	137	also VBX,NPO,VNF,VPC,KFB,KPF
mni	mni	14075/95	Same network & A1A			RMLN using this freq
010191	1020	14186	—	F1B	4	RTTY 1000Hz
250191	1000	14214/6	SLF	A1A	17	Traffic out on F1B
181290	0200+	21031.5	UMS	F1B	34	ID in A1A USR naval radio
mni	mni	21283.5	UMS	A1A	61	Moscow naval radio USR 18hrs
mni	mni	21347.5	—	F1B	41	Same format as above 18hrs
2801	0849	24893	—	P0N	2	More obvious as the months pass

OTHR is into the bands not being occupied. Proves the point I've been trying to make: if we do not use them, others will. GET THE MESSAGE YET???

My thanks this time to VKs 4YD, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 4EKA, 5TL, 5GZ, 6HQ, 6XW, 6RO and 7RH.

73, GORDON VK4KAL

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
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*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

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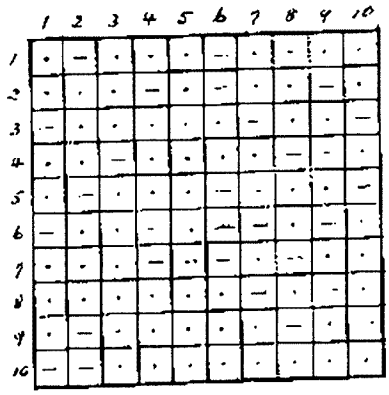
Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 49



Across: 1 eager; 2 cats; 3 beau; 4 sins; 5 Katy; 6 fog; 7 fur; 8 user; 9 Maud; 10 hits

Down: 1 waste; 2 heir; 3 zone; 4 dive; 5 tips; 6 rose; 7 poem; 8 suite; 9 bod; 10 ices

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VK2BWI	Nightly at 2000 local on 3550 kHz
VK2RCW	Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
VK3RCW	Continuous on 144.950 MHz 5 wpm, 10 wpm
VK4WIT	Monday at 0930 UTC on 3535 kHz
VK4WII	Tuesday at 0930 UTC on 3535 kHz
VK4WCH	Wednesday at 0930 UTC on 3535 KHz
VK4WIS	Sunday at 0930 UTC on 3535 kHz (0830 UTC during summertime)
VK5AWI	Nightly at 1030 UTC on 3550 kHz
VK6RAP	Nightly at 2000 local on 146.700 MHz
VK6WIA	Nightly (except Saturday) at 1200 UTC on 3.555 MHz

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May 1991
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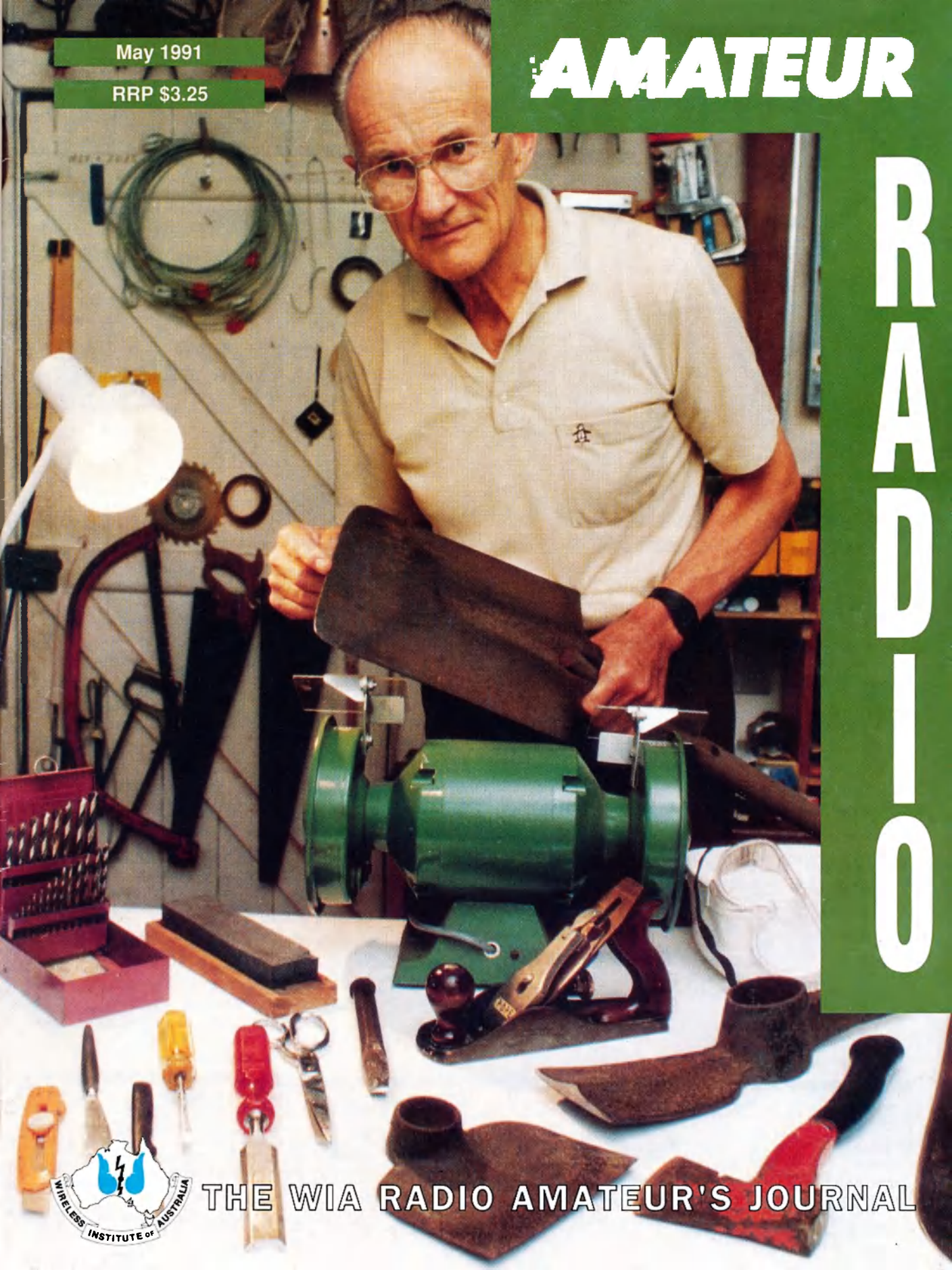

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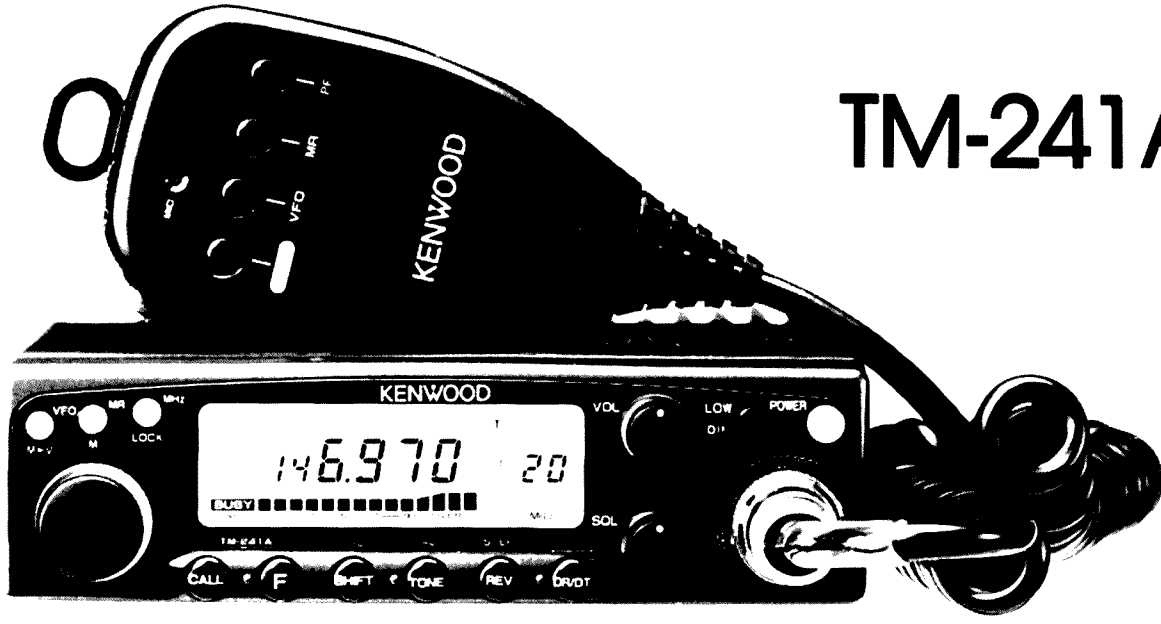

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- Pager Function*
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- Time-Out Timer
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* optional features

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Model.....

AMATEUR RADIO

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EXECUTIVE EDITOR
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MANAGING EDITOR
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ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161

Telephone: (03) 528 5962
(03) 523 8191
Fax: (03) 523 8191
(Non dedicated line)
Business hours: 9.30am to 3pm weekdays

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Cover

A self portrait of Vic Joyce VK2EVJ. Whatever form our interest in amateur radio takes, we all have the need to sharpen tools from time to time. Vic tells us how in his article 'Tool Sharpening' on p 11.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Exponential Expansion

No, this is not going to be a lesson in mathematics! History, perhaps. And yet, as we will see, there is a connection between the two areas of understanding. This word "exponential" is one we encounter frequently in electronic circuit theory; but how does it apply to history?

Essentially, an exponential process is one in which the rate of increase (or decrease) of some quantity depends at any time on what happened to it just before, and that in turn, just before that, and so on. In other words, each generation builds on the work of its predecessors. Population growth is one excellent example, whether of bacteria in a culture or people on a planet.

One field in which this rule applies is the growth of communications. Beginning at the time when speech had first evolved, the human race has always had a need to communicate over more than shouting distance. A few thousand years ago, a fast runner with a message stick was the latest technology. This evolved into a messenger with a written scroll, riding a camel or a horse. Wheels came into being, and sails to cross the water; but only a few hundred years ago it still took many months to send a message to the other side of the world, and just as long for a reply to come back!

After a few side-tracks with signal flags, semaphores and heliographs, along came electric telegraphy and submarine cables. This made it possible for a chosen few to span the globe in a matter of minutes. Only 40 years more before Hertz and Marconi showed the way to radio; which really began with amateur radio! The telephone system began to evolve, and when allied with HF radio it became possible for private citizens to talk around the world.

At this stage (the 1930s), someone enunciated an aim for communication engineers to work for: That it should be possible for any person on earth to talk at will to any other as chosen, and if no reply was received, to know the other person had died! In some ways, with some limitations (the ionosphere for one), we radio amateurs as a group have been closer to achieving this aim than most others, until the marriage of the telephone system with geosynchronous satellites. In the meantime, the world's telephone population expanded (exponentially?), manual exchanges disappeared, customers dialled their wanted numbers, first locally, then nationally, then internationally. Computers managed the process, from path selection to preparing the bill! Finally achieving the engineer's aim now depends not on engineering, but on bringing the rest of the world up to the economic level of the more privileged nations. And that may well be a far more difficult process!

Where do we go from here? TV telephones, optical fibres already replacing wires; mobile phones already appearing in cars and aircraft, for the use of the general public. Phone answering machines and faxes are proliferating (exponentially?). The engineering problems are all soluble; and we radio amateurs can take some pride in having helped to solve them. What are we like at economics?

WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

HF Contest Championship

The WIA HF Contest Championship, which is awarded each year, is calculated from the scores obtained in the four major WIA sponsored contests, the John Moyle Memorial Field Day Contest, the Remembrance Day Contest, the VK Novice Contest, and the VK/ZL/Oceania Contest. Eligible candidates for this prestigious award must be WIA members, and must have submitted scores for a minimum of three of the four contests.

The 1990 HF Contest Championship winners have now been announced by the Federal Contest Co-ordinator, Neil Penfold VK6NE.

The Phone section has been won by Phil Rayner VK1PJ, with an outstanding performance as top scorer in each HF contest he entered. The CW section resulted in a tie between Russ Coleston VK4XA, and Jeff Jeffrey VK6AJ.

All three winners will receive inscribed wall plaques as permanent records of their achievements.

Amateur Satellite Usage

There is no doubt that, through amateur satellite activities, important contributions have been made by a number of amateur radio societies.

However, IARU Region 3 has expressed concern that some of the projects making use of amateur satellites are not entirely appropriate to the use of amateur bands.

In accordance with the definition of the amateur satellite service provided for in the ITU Regulations, an amateur satellite should be such:

1. that its purpose or mission should be for self-training, intercommunication and technical investigation; and

2. that its service should be carried out by radio amateurs, that is, by duly authorised persons interested in radio techniques solely with a personal aim and without pecuniary interest.

Member IARU societies are asked to monitor national satellite activities to ensure that sponsoring bodies are aware of and act within the guidelines.

WARC 92

The IARU calendar for March 1991 notes that WARC 92 is now less than a year away, and lists June 1991 as the deadline for administrations to submit proposals to the ITU for circulation.

IARU representatives have attended WARC-related CCIR meetings recently held in Duesseldorf, Melbourne, Geneva, Helsinki and again in Geneva. David Wardlaw VK3ADW, the leader of the WIA WARC 92 team, has just returned from Geneva where

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Ted Pearce Jan Burrell Ken Ray	VK1AOP VK1BR VK1KEN	3.570 MHz 2m ch 6950 70cm ch 8525 2000 hrs Sun (R Denotes repeater) Times 1045 and 1915 on Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Tim Mills David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2ZTM VK2KFU	1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Eddie Fisher Eric Fittock	VK4AOK VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Alyn Maschette John Farnan Bruce Hedland - Thomas	VK6KWN VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

he was a member of the official Australian delegation to the JIWP meeting.

WARC 92 is a major theme at most IARU meetings and Conferences, and the IARU is coordinating the approach of all societies concerned with protecting the interests of all amateurs.

Import Duty Exemptions

From time to time the WIA receives inquiries from members who wish to bring transceivers back to Australia after an overseas trip. These members usually wish to know how they can avoid paying import duty on amateur equipment for personal use.

Since 1984 the WIA has had a hard-won authority from Australian Customs and DoTC to certify that transmitters and transceivers, which meet the agreed guidelines for amateur use only and cannot be easily modified for use on other bands, can be exempted from import duty.

However, under the terms of the agreement, certification applies to the importer and the type of equipment jointly, not to the equipment only. What this means is that "John Smith" can obtain an import duty exemption certificate for a "Mark X" transceiver (provided the transceiver meets the criteria), but that certificate will not allow "Jack Bloggs" to import an identical "Mark X" transceiver. "Jack Bloggs" will need to apply for a separate import duty exemption certificate.

As the WIA has to submit each application for an import duty exemption certification to professional consultants, the fee, currently $167.00, is the same whether it is a dealer importing 50 units, or an individual amateur importing one unit.

Therefore, unless you pick up a rare, substantial bargain overseas, it is generally cheaper to buy a new transceiver from an authorised dealer in Australia. It is certainly a lot less hassle, and there is no uncertainty about warranty.

Front Cover Photographs

Following the recent request for photographs suitable for publication on the front cover of Amateur Radio magazine, we have received several interesting and potentially useful contributions, some with articles attached. However, there is always a need for photographs for Amateur Radio magazine, and they are welcome whether or not we have run an appeal.

Primarily the Publications Committee is looking for photographs with a subject matter of interest, preferably quality positive transparencies or prints with good definition, and with a composition which matches or can be cropped to fit the proportions of the cover and with scope for overprinting without diminishing the picture. As you can see, not every photo, no matter how good, is suitable for the front cover, but can often be used in the body of the magazine.

And don't forget. A fee is paid for every photo used on the front cover of Amateur Radio magazine.

Morse Code Lives

The second IARU Region 1 High Speed Telegraphy Contest will take place in Neerpelt, Belgium over the weekend of the 4th - 6th of October 1991. The event is being organised by the Union der Belgischen Amateurfunker (UBA). Although this is a Region 1 contest, member societies from other IARU Regions may take part as "Unofficial teams". At this time, CRSA, JARL and KARL from Region 3 have indicated an interest in competing.

Any group interested in arranging a WIA team will find the rules published in the documents of the IARU Region 1 1990 Conference, which was held in Torremolinos, Spain, or may write direct to:-

Mr. Anton Mandos, ON6NL,
Truyenstraat 12,
B-3460 Molenbeersel,
Belgium.

Golden Antenna Award

Each year for the past 9 years the town of Bad Bentheim in Germany has awarded a "Golden Antenna" award as a symbol of outstanding humanitarian achievement in the field of amateur telecommunications. This honour has been conferred on amateurs from a number of different countries.

The 10th award is to be made at the 23rd German/Dutch Radio Amateurs' Congress in Bad Bentheim from 22nd to 25th August 1991, and all amateur telecommunications organisations are invited to submit nominations.

Do you have a nomination for an Australian amateur who has made an "outstanding humanitarian achievement in the field of amateur telecommunications"?

Australian Standards

The March 1991 issue of The Australian Standard, the journal of Standards Australia, includes in its publication list DOC 3000R/7 1991 Rulings to SAA Wiring Rules (AS 3000-1986) seventh group.

This update may be of interest to a number of members of the WIA.

The "Drafts for Comment" section also includes minimum requirements for fixed and portable units used with the second generation cordless telephone common air interface system.

160 Metre Event

The Hastings Branch of the NZART, ZL2BEI, recently advised that, in an endeavour to "liven up" 160 m again, national and international advertising has occurred inviting the participation of other amateurs to a "have a go" event on 160 m. This follows last year's unsuccessful event on 160 m.

The frequency to be used for this 1991 event is 1850kHz +/- 10 kHz (SSB or CW).

The time is to be 2000 to 2400 hrs NZT (1800 to 2200 hrs EAST).

The dates are 21st and 22nd June 1991.

See if you can borrow a crane or tower or even load up your 80 m antenna. The New Zealanders would be pleased to work you.

Band Plans and Agreements

Geoff Wilson VK3AMK, in a recent letter notes that the release by DoTC of the sub-band 50.050 - 50.200 MHz to Australian amateurs on the east coast has allowed reception of some "stunning long haul DX", with "once in a lifetime" openings to areas such as West Africa and frequent openings to Europe, 9L1, 6W1 and KL7 from various parts of Australia.

One of the major intentions behind the battle to gain this sub-band was to be able to use it for international DX. Geoff's concern is that the frequencies are being used for local, short distance contacts, contests or "rag-chews" which could just as well be conducted on the 52.000 - 54.000 sub-band, where the amateurs are the primary service. He suggests the following guidelines for 6 metre operators. What do you think?

1. DoTC allocated 50.050 - 50.200 MHz for Australian stations to participate in working **International DX**.
2. Two modes only to be used, CW and SSB.
3. 50.110 MHz is an internationally recognised **DX calling frequency**, should be used for that purpose **only** and **shared** among operators, and should be used with extreme discretion and care.

4. 50.050 - 50.100 MHz to be used for **CW** mode only.

5. 50.100 - 50.200 MHz to be **shared by CW and SSB** modes.
6. The Amateur service is the **Secondary** service between 50.000 MHz and 52.000 MHz.
7. Most important of all, **50.050 - 50.200 MHz to be used for International DX working purposes, not for either inter-state or intra-state operation.** Every VK call area has full access to 52.000 - 54.000 MHz, and this section is perfectly adequate for both inter-state and intra-state operations.

It would be a pity if Australian radio amateurs lost the use of this band because of poor operating practices. Geoff pleads that the dedicated 6 metre DX enthusiasts would appreciate the co-operation of the non-DXers.

Electromagnetic Interference Review

DoTC recently announced the forthcoming release of a paper canvassing issues relating to electromagnetic interference and outlining a strategy for management of the problem. Industry will be invited to comment. We trust that the WIA will be invited to do likewise.

VNG Frequency Change

Marion Leiba, VK1VNG/BNG, Honorary Secretary of the VNG Users Consortium, advises that *"Our standard frequency and time signal service, VNG, is about to change frequency. It has been issued a permanent licence on 16 MHz to replace the temporary transmission on 15 MHz. The 15 MHz broadcast is expected to cease at 0700 UTC on 6th May 1991. Transmission on 16 MHz should commence at 0000 UTC on 8th May 1991. The mode will be double-sideband, full carrier amplitude modulation, at 10 kW power. The aerial will be a quadrant with a single strand of wire on each arm.*

VNG is now licensed permanently on both 5 and 16 MHz. We are negotiating for frequencies to replace the present temporary 10 MHz transmission. Inquiries and reception reports may be sent to:

VNG Users Consortium
GPO Box 1090
Canberra ACT 2601
AUSTRALIA."

Is Your Equipment Identified?

Do you have recorded in a safe place the numbers of **ALL** your amateur radio equipment? Could you identify an item even if the serial number had been removed? Is your insurance cover adequate? What do you do if some of your equipment is stolen? How do you react if offered equipment you suspect to be stolen?

These questions became a topic of discussion in the Executive Office recently as a result of a fax recently received from Henry Kop, VK5KUJ, reporting that the Lower Eyre Peninsula Amateur Radio Club shack had been burgled. Items stolen include three transceivers, a VFO and a computer and disk drive. They are listed in detail in the *Stolen Equipment* section of this issue of Amateur Radio magazine, and have been processed into the WIA Stolen Equipment Register. We certainly hope that these items are recovered very soon, and sympathise with the club in its loss.

The procedures to be followed in case of loss of equipment, or sale of suspect items, were given in the February issue of Amateur Radio magazine. However, to summarise:

1. Inform the Executive Office at once, in writing, if you do have items stolen, giving details of manufacturer's name, model, type of equipment, serial number, date stolen, owner information, any identifying features or modifications and police contact.
2. If offered an item which you suspect of being stolen, check with your Divisional Office or the Executive Office with as much detail as possible of the item in question. If it appears to tally with an item on the register then that becomes a police matter. Naturally, if stolen equipment is recovered, you should inform the Executive office so that the Register can be amended.

Club Talks to Space Shuttle

RAAF Williams Amateur Radio Club, VK3APP, a recently re-formed club, has created a substantial amount of publicity for amateur radio operation in its attempt to communicate with the Atlantis Space Shuttle (STS-37) on 6th April 1991. Students from the RAAF School of Radio were able to talk to the Shuttle during orbit 14.

The link was established using a Kenwood TR-9130 with a DSE 100W 2m linear, an ICOM IC-3210 and a simple antenna system. VK3APP was one of nine stations fortunate enough to participate in the Australian Schools Special Activity Programme initiated by NASA.

As you would expect, Murphy was present during the attempt. Full details next month.

Two Become One

The Calendar of the IARU for 28th March 1991 announced that, following the re-unification of Germany, the two countries formerly represented separately in IARU, have become one country. By agreement between the two organisations, the Radiosportverband (RSV) has been dissolved and DARC (Deutscher Amateur Radio Club) has assumed all the functions previously performed by the RSV. QSL service to Y2 - Y9 stations is now provided by the DARC QSL Bureau, and all other IARU matters are being handled by DARC.

ITU Day

The International Telecommunications Union (ITU) is the oldest intergovernmental organisation in the world. Each year on 17th May the ITU celebrates World Telecommunications Day to publicise the ever increasing role of telecommunications in the world and the scope for international co-operation in technical developments.

Each year the role of the amateur community is recognised when DoTC, on request from the WIA, grants permission for each Division of the WIA to put a station on air on 17th May using the suffix ITU.

IARU Satellite Co-ordinator

Mr. Fred de Guchteneire, ON6UG, has been appointed as IARU Satellite Coordinator, a position first established in 1989, but not previously filled.

10th ARRL Computer Networking Conference

Papers are invited for this conference which will be hosted by the Northern California Packet Association in the San Francisco area on 27th - 29th September 1991. Topics will include HF packet investigations, network development, digital signal processing, digital speech, hardware, software, protocols, packet services, packet satellites and future systems. Paper guidelines and/or author's packages are available from Lori Weinberg at ARRL, 225 Main St., Newington, CT06111, (Tel. 203 666 1541, fax 203 665 7531). The deadline for receipt of camera-ready papers is 12th August 1991.

WIA International Representation Fund

Donations to this important fund received at the Executive Office in the past month have come from:

W. Amisano	VK4JCU
E. Buggee	VK3AX
B. Gall	VK2EFD
H. Ilvess	VK6YHI
A. Manning	VK7LR
L. Rice	VK6CP
A. Scovell	VK2FKE
R. Shortell	VK4ARS

Tumut and District ARC.

Executive Office Update

The recent replacement of one of the Executive Office computers, and the installation of a LAN networking all four

office computers, has greatly increased the flexibility of operations in the office and will allow improved efficiency.

Call Books

There are still a few copies of the 1991 Call book available from the Executive Office, at a cost of $9.50 each, plus postage. This is perhaps an appropriate time to remind members to ensure that their information held in the Executive Office files is correct when it comes time to commence production for the next Call Book in a few months.

Amendments to call signs are advised to the WIA monthly by DoTC, but any information about changes of address or suppression information must be submitted in writing to the Membership Secretary at the Executive Office.

WIA Meets NZART

At the end of May two delegates from the WIA will travel to New Zealand to attend the NZART 1991 Annual Conference. It is a long-standing agreement between the two societies that each sends representatives to the other's Convention in alternate years. This allows for closer co-operation and discussion of both internal and international matters, and is particularly important this year in the preparation for WARC92.

Last year the WIA was host to Jim Meacham, ZL2BHF, and Cathy Purdie, ZL2ADK, the ZL Education Officer, who was able to provide some very useful ideas on school activities connected with amateur radio.

The WIA delegates to the NZART 1991 Conference will be Ron Henderson VK1RH, and Bill Roper VK3ARZ.

WIA Members Role Identification

Because of the broad-ranging interests of our members, we find amateur radio operators involved in a number of fields not directly related to the hobby, but bringing their radio skills and abilities to the particular task, or, because of their radio background, being able to see connections not immediately apparent.

Many school teachers have been able to extend student horizons by bringing amateur radio into the classroom. For publicity and public relations purposes, it is useful if we know about activities in which the amateur operator can contribute much more than the average worker.

Please tell the WIA if you know of or are participating in such projects, either technical or social. We sometimes need to be able to specify more than disaster communications to justify our generous band allocations.

Australian Disaster Management Network

A recent newsletter from CIRCIT (Centre for International Research on Communication and Information Technologies) reports on the plans to establish a PC-based computer network to link Australian counter-disaster and leading research organisations. WICEN will be one of the active participants in the planning and testing of proposed systems.

BRENDA EDMONDS VK3KT
BILL ROPER VK3ARZ

Random Radiators

RON FISHER VK3OM AND
RON COOK VK3AFW

Directivity of HF Antenna

HERE IS A SHORT ARTICLE contributed by William VK3MI on the vertical directivity of HF antennas. Over to you, William.

Many amateurs seem to have the opinion that the classical doughnut pattern, with no endfire radiation, of the free-space dipole applies to their HF installation regardless of ground effects!

At VHF this may be so, but few manage a height above ground of a quarter wavelength (λ/4) for their horizontal dipole on 80 metres, and most are closer to 1/10 wavelength (λ/10). These spacings are typical of a two-element Yagi (dipole and reflector), in this case, transmitting a cone of energy vertically toward the ionosphere some 120-400km above.

When this reflection contour is observed from a distant receiver (10-500km away) from ***any*** *direction it will appear as a slightly oblate circle with almost no observable directivity!*

As frequency is increased and, of course, a greater effective height in wavelength terms, the classical directive patterns illustrated in the texts (eg ARRL and Radcom etc) come into effect.

However, as the vertical incidence MUF only falls below 3.5MHz for the two hours prior to dawn at some seasons, the 80m band is outstanding for short to medium distance communications in our temperate zones away from the tropical summer static noise.

That part of the pattern reflected by the ionosphere from almost vertical incidence fills in the "skip zone" while that part reflected from 45-80 degrees incidence provides almost non-directional coverage out to 600km or so.

The ARRL Antenna book (chapter 2) and Radio Communication Handbook RSGB (chapter 12) discuss this and supply pattern diagrams for λ/4 and λ/8 heights and suggest gain in the vertical direction for those with a ***perfect*** *earth. However, with the clay at this QTH baked to porcelain by summer sun the losses probably outweigh any gains!*

For those with the yen for DX on the lower HF bands the vertical antenna should be the answer for radiation at low angle with a "cone of silence" immediately above. "Skip distance" between local radiation and reflected signal then occurs in the intermediate zone covered by the horizontal dipole and accounts for some of the poor signal reports between the two.

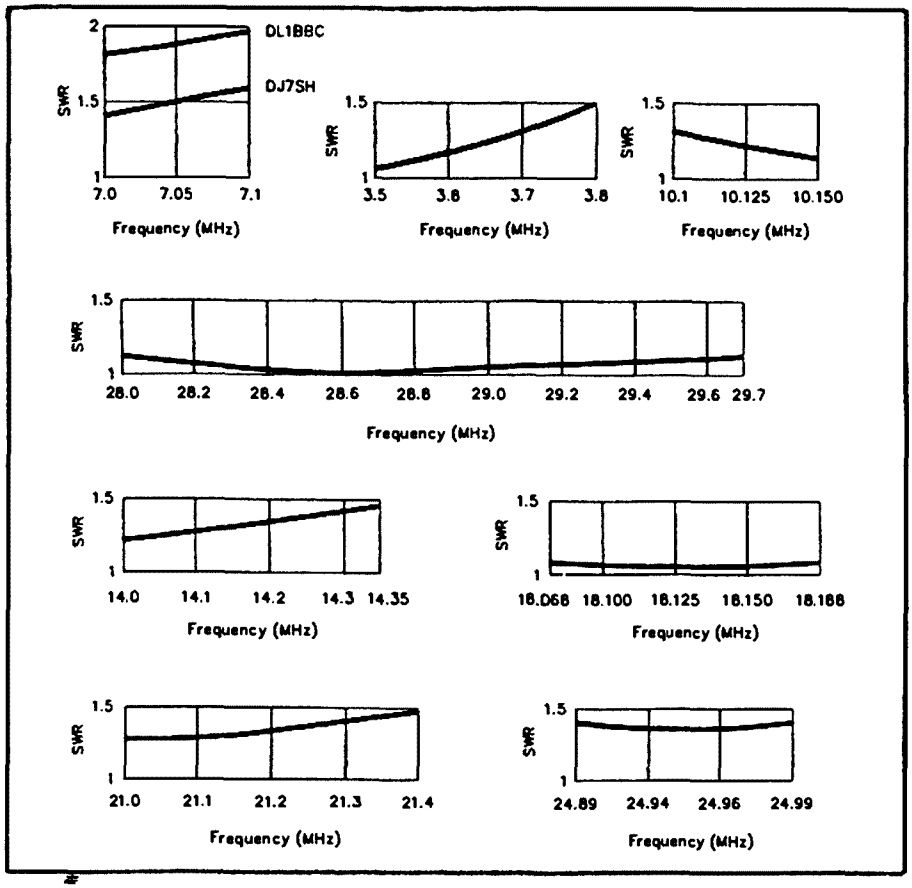


Fig 2: SWR curves for the eight-band double Windom.

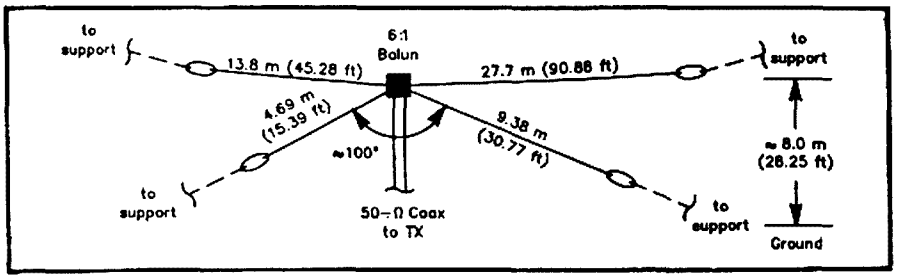


Fig 1: Double Windom

Altitude remains the physical problem while the loss resistance of the earth connection is the electrical one. Rod and driven pipe earths can vary from 10 ohms in a salt marsh to 50 or 100 ohms in clay or sand so the distributed earth of a metallic pipe water supply is preferred but, particularly for received noise, should be separated as far as possible from the electricity supply earth on these same pipes.

With all these problems is it any wonder some prefer to operate portable from a quiet country location with a random wire antenna!

In a later article we will look at verticals and the reasons they sometimes don't work as expected. In the meantime, further contributions on the subject are encouraged.

Quads vs Yagis

The article in our last column has stirred up some interest. We will give this some further attention in the next column. Further contributions are welcome.

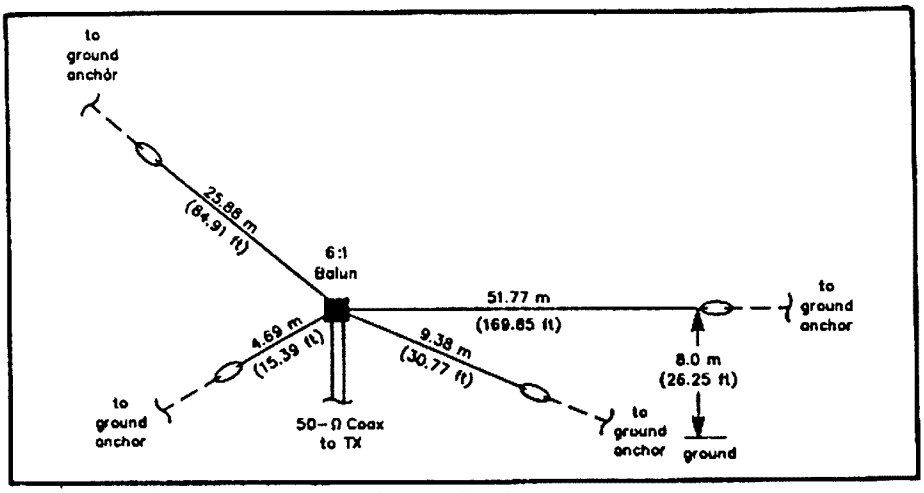


Fig 3: A double Windom antenna for nine bands.

The Windom Again

It seems that the most popular antenna for discussion is the Windom. Robert VK3XZ suggests that the transformer described on p36 of Jan '91 *AR* could be modified to enable 300 Ω ribbon to be used instead of 50 Ω coax. Reversing the transformer gives a step up and a reasonable match to 300 Ω. It may be advisable to use four loops of wire through the toroids to provide sufficient inductance at the lower frequencies. Of course, there is then the problem of matching the transceiver to the 300 Ω line.

Robert raised several other matters which have been taken up in direct correspondence. He also provided some copies of early articles on the original wire-fed Windom from the second edition of the *RSGB* handbook and the fifth edition of the *Radio Handbook,* 1938. Thanks, Robert.

Feedback

Charles VK2NAJ found even the VK Windom too large and so he put up one of half size, that is 33ft long with the feed point 11ft in from one end. Charles points out that wrapping the wire around the insulator reduces its length by up to 25mm and suggests allowing for this when measuring out the wire.A marking pen may be used to mark the wire prior to cutting.

Charles connected a 50 Ω coax directly to the antenna and found the SWR to be only 1.3:1 on 21.180MHz. On the 14MHz band the VSWR was about 5:1 and around 3:1 on the 28MHz band. A number of good contacts were made into North America and Japan on both 15m and 10m. After using the antenna for several weeks Charles has reverted to his wire antenna, (71'-6" or 21.79m long) which he finds works well on all bands when used in conjunction with his EAT300 ATU.

Charles also forwarded an article, "DX Dipole for Restricted Sites" by G3XAA which was published in *Practical Wireless,* March 1982. A precis follows.

For restricted QTHs a dipole is a good compromise, being cheap, easy to build and not a significant impact on the neighbours' view. Some QTHs prevent the erection of a dipole aligned to give maximum signal toward a favourite DX location. Making the dipole more than one half-wave long produces lobes, with some gain, at various angle to the wire axis.A dipole 20.003m long is resonant on the 40, 20, 15 and 10m bands, and this gave lobes toward the target area. G3XAA was unable to use centre feed and selected a feed point 3.334m from one end. Fifty Ω coax was used directly, and a VSWR of 1.6:1 was obtained at 21.30MHz.

Comments

This is essentially a 3/4 wavelength dipole-fed 1/4 wavelengths from one end. The use of direct coaxial feed for off-centre-fed antenna is not recommended, especially if multi-band operation is intended. A toroidal RF choke can be made by either slipping four small ferrite cores over the coax close to the antenna or looping the coax through a larger core four or five times. The latter will present a heavier mechanical load and may be a problem for dipoles supported at the ends only. The objective is to provide a choke for the currents that try to flow on the outside of the coax. The currents inside the cable will not be "choked" but will be forced to be equal in magnitude or balanced. Waterproofing will be required.

Multi-band operation will be possible with an ATU. The Windom achieves multi-band operation without an ATU, but does not cover all bands.

Questions and Answers

Now for some answers to other points raised by various other readers. Teflon-insulated wire is not absolutely necessary for the transformer and any insulation suitable for RF use may be used.

The core material can be varied. There is a wide range of materials from different sources which may be used. All that is required is a material with low losses over the frequency range to be used and a permeability of, say at least 50. Reducing the permeability means that a larger cross section or more turns are required to keep the winding inductances several times greater than the load to be connected across it. The objective is to have most of the current flowing in the load and not providing magnetising current or core loss current.

Yes, it is possible to connect a coaxial cable directly to the feed point. However, then an ATU will be necessary on all bands, and it is almost certain that a considerable amount of RF current will flow down the outside of the coax, giving additional radiated signal. This might be useful for DX working or it may cause RF feedback in the rig and create other problems. In general, except for emergency operation, we cannot recommend direct connection of coax to an off-centre-fed dipole.

Why aren't the resonant frequencies exact multiples of the fundamental resonance? It all has to do with the end effect. An infinitely thin dipole in free space has a resonant length L_f given by:

$L_f = 492/f$

where f = frequency in MHz and

L_f = length in feet

A real antenna made from wire is about five per cent shorter for the same resonant frequency. In practice the small capacitance across the end insulators will also reduce the resonance length. For a typical wire this gives:

$L_f = 468/f$

where f = frequency in MHz and

L_f = length in feet

If there is more than one half-wave then the length for harmonic resonance needs take into account only the end effect on the two outermost quarter-wave lengths. Thus the second harmonic frequency is slightly higher than twice the fundamental.

The formula given in various ARRL publications is:

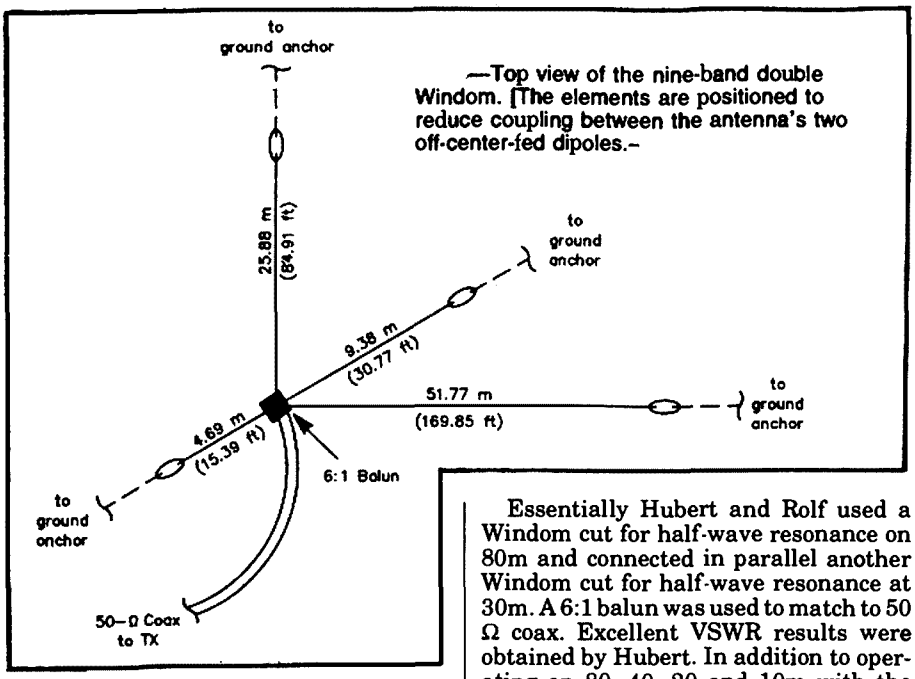
$L_f = [492(N - 0.05)]f$

where N = number of half-waves

Table 1 illustrates the point more clearly

Table 1 Resonances of a Dipole – f in MHz

Fundamental	Harmonics						
	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth
3.435	7.050	10.665	14.281	17.896	21.512	25.127	28.742



—Top view of the nine-band double Windom. [The elements are positioned to reduce coupling between the antenna's two off-center-fed dipoles.–

Fig 4

It is interesting to note that the dipole has resonances close to all the recently allocated "WARC" bands.

More Windom Designs From Canada

After writing the earlier article on the VK Windom, two other articles on the Windom came to my attention. In the August 1990 edition of *QST* there was an article by John Belrose VE2CV and Peter Bouliane VE3KLO titled "The Off-Centre-Fed Dipole Revisited: A Broadband Multiband Antenna".

The article gives a short historical background on the Windom and the search for a dipole which would give low VSWR from 3.5 to 4.0MHz. It claims a 460kHz 2:1 VSWR bandwidth for an 80m dipole fed with a 6:1 balun. Excellent broadband results were reported in the 40, 20 and 10m bands. Results for a 4:1 balun were also reported. While the 6:1 balun gave better bandwidths, the 4:1 balun gave lower minimum VSWR in the 80 and 40m bands. This suggests that the impedance of the Windom is nearer 200 than 300 ohms on those frequencies which is in general agreement with the VK Windom article.

From Germany

An appendix to the previous article reproduces a translation of "Eine Doppel-Windom Antenna für Acht Bänder" (A Double Windom Antenna for Eight Bands), by Hubert DJ7SH and Rolf DL1BBC published in CQ-DL, September 1983, p427.

Essentially Hubert and Rolf used a Windom cut for half-wave resonance on 80m and connected in parallel another Windom cut for half-wave resonance at 30m. A 6:1 balun was used to match to 50 Ω coax. Excellent VSWR results were obtained by Hubert. In addition to operating on 80, 40, 20 and 10m with the larger dipole, the second dipole gave operation on 30 and 15m. The surprise was a low VSWR on the new WARC 17 and 12m bands. Not to be content with that, the pair replaced the longer dipole with one cut for half-wave resonance on 160m and obtained a nine-band double dipole system.

The main dipole was 8m above ground and the smaller dipole was an inverted vee configuration with the arms at an angle to the main dipole to reduce coupling between them. See figures for details.

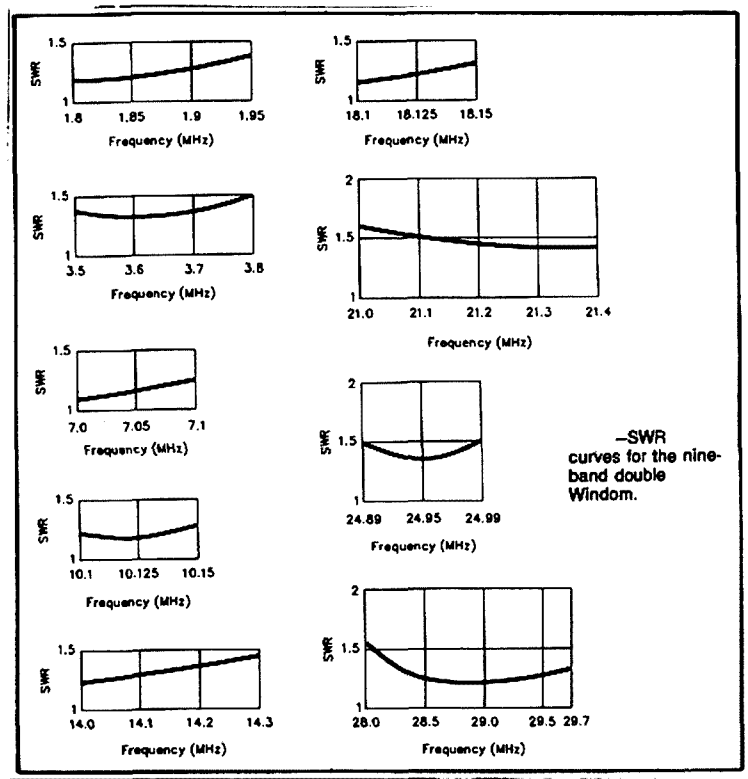
From Italy

In the October issue of Radio Revista there is an article (pp 30-31) on the Windom by Umberton IK5CLX. He describes a modified 4:1 balun, tapped so as to give 6:1 transformation. The dipole is made from 2mm diameter wire, 83.5m long and fed 30m in from the end than would be expected for the "normal" Windom.

The article includes a VSWR curve which seems to be a bit too good to be true. The worst case is only 5.5:1 at 5MHz in the span 1.5 to 30MHz. In the amateur bands, the bands 80, 40, 20, 17, 12 and 10m all show less than 1.5:1, with 160m giving about 1.8:1, 30m 3.5:1 and 15m 2:1. The theoretical VSWR is very much higher and the only explanation we can provide for the lower reported values is the presence of losses that have lowered the effective Q of the system. Whether these losses are in the balun or the immediate environment, we cannot say. Standing-wave antennas normally have off-resonant or anti-resonant measured VSWRs of at least 10;1.

Well, that's all for this time, so it's 73 from me and 73 from him.

(Diagrams are reproduced from QST August 1990 - ed) **ar**



—SWR curves for the nine-band double Windom.

Fig 5

Tool Sharpening

VIC JOYCE VK2EVJ
17 PRESCOTT AVE, DEE WHY 2099

THERE IS NO SUBSTITUTE FOR sharp tools — scissors, knives, drills, chisels, screwdrivers, paper trimmer, garden tools etc, and a little application can work wonders. There are principles and rules for the sharpening of all tools, but a lot of them apply to several.

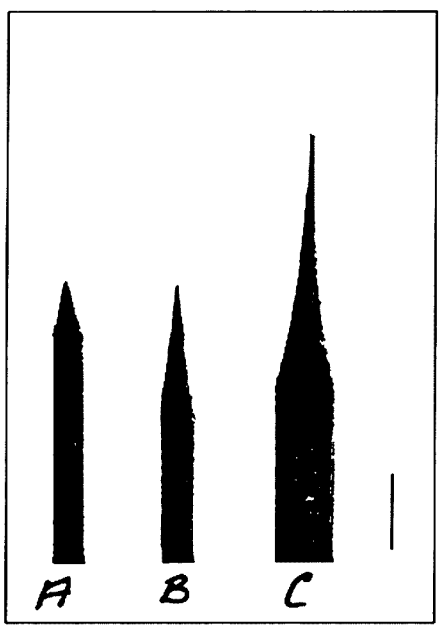
Warning! Always wear safety glasses or use clear plastic guards when using power grinders. Note that some tools can be sharpened with a file; a diamond file can be especially effective, even for final shaping of a drill! Be careful because they are expensive.

Knives

The degrees of sharpness possible depends on the material, a surgeon's scalpel has the steel for the finest edge, lesser steels have to be proportionally more obtuse.

The finer the edge is, the longer it will stay "sharp". You have to learn how fine you can sharpen your particular knife: those with break-off sections can be finer than fixed blades; carving knives can be quite fine; but stainless steel fishing or table knives can't hold that fine edge and will need sharpening more often.

Illustration (a) represents soft material. Notice that a little wear on the tip makes it very "blunt" and that will happen quickly because of the softness of the metal.



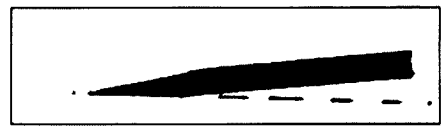


Illustration (b) represents a hard steel knife. Here the finer edge allows more use before becoming blunt and this is helped by the hardness.

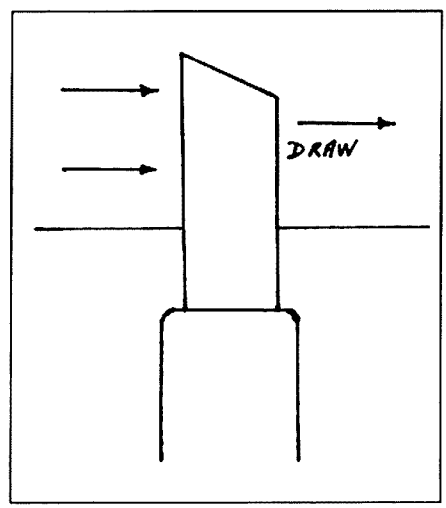
Illustration (c) is a "hollow ground" knife. This is done by grinding on the curve of the wheel so it curves out some of the body of the knife, it applies to some carving knives. You can see how this gives them extended "sharpness" and how easy it is to keep them sharp with occasional honing, usually with a "steel". This steel is really a file and needs to be in good condition. An extremely effective new "steel" has a diamond dust surface.

An occasional rub each side of a "steel" will usually keep such a carving knife very sharp for years.

When the edge has gone from a kitchen knife you can see a shine on it. Be sure not to abuse a knife by cutting down on to crockery; you will commonly find the tip worn badly through this and it could need grinding to reshape.

A power grinder can be used to shape a knife very quickly, the resulting "rough" edge shaped on a coarse oilstone then honed to a "keen" edge on the fine side of the oilstone. However, the coarse side of a stone is usually sufficient for the shaping.

The sharpening angle is very critical. Use a light oil on the coarse side of the oilstone, spring the blade to get good pressure on the edge and work well across the stone until you can feel a burr on the opposite side. Use as much of the surface of the stone as possible to wear it evenly.



When both sides have been shaped, do the finish honing on the fine side. Bear in mind that drawing across or working up and down will give the finest edge.

Break-off tip blades are very hard steel, so will carry an excellent edge, but breaking tips off means that in short time you have either a short blade or have to go down the street for another! It is far better to re-sharpen. While working, an occasional hone by drawing the blade across a quite dry stone will keep the edge very sharp for you.

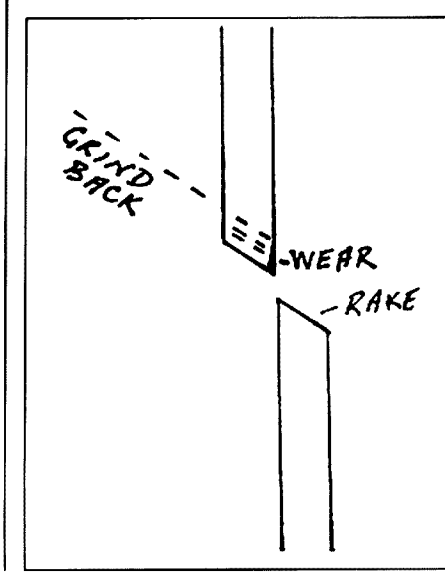
Scalpel blades are used by artists for "scraping" images and cutting, and are commonly thrown away; but again, it is easy to hone them to an excellent working edge again by simply "drawing" them across a fine oilstone.

In days gone by we sharpened "cut-throat" razors on a quite smooth "wet stone". Some safety blades can be sharpened by working up and down in a glass of water!

Scissor Action Tools

The very nature of these means that they will tend to cut away some of their own metal! Look very carefully to see if this happened, then grind away the worn section as necessary.

They all have different "rake" angles: some gardening tools have very sharp angles, maybe on one of the blades; scissors have a medium angle on both; tin snips have almost no angle; paper trim-



mers have little angle and need very careful grinding to keep the cutting edge straight.

Establish these angles before grinding; keep the tool cool by dipping in water frequently, and practise till you can grind a neat line. Finish on an oilstone where appropriate.

All scissor blades have to be angled towards each other so there is good contact for the length of the blade. Check and oil all of the pivot system: with scissors, the pivot must be neat but not tight; the blades curved or bent slightly towards each other so contact at the end is the tightest, but not so as to make operation uncomfortable. If scissor pivot is too tight, it may be necessary to hold the rivet over a hole while tapping it with a hammer.

Machine Twist Drills

First, establish the angle of the tip for holding the drill to the wheel. Make sure the sides of the drill are not worn through using while blunt or drilling into extremely hard materials. The tip will have to be ground right back to good sides.

Second, consider the rake on the cutting edge: normally this is due to the twist in the drill, but you can change it by grinding. For instance, if drilling brass, you would reduce it to almost nil.

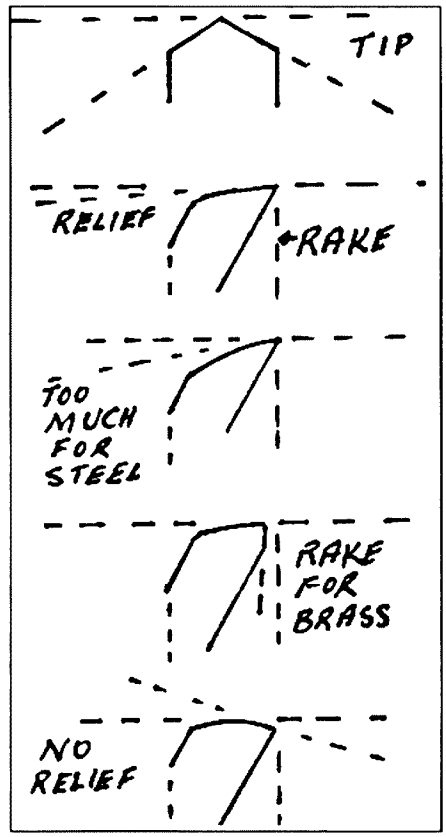
Third, the "relief" behind the cutting edge. This controls the penetration and is the most critical part for resharpening. Obviously, unless the edge is sharp and there is relief behind it, there is no way the drill can cut. Because it is designed to cut into hard materials the relief cannot weaken the edge significantly, but still must allow reasonable penetration.

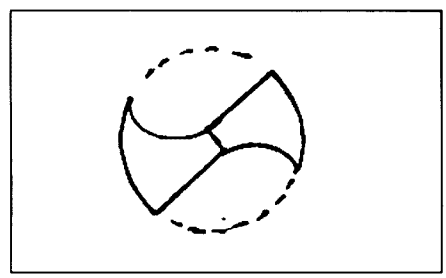
Because you are grinding a round drill on a flat surface you will have to rotate it so the relief is continued to the back edge.

Lastly, there is the entrance part of the drill, the peak at the centre of the tip. It cannot cut, so has to be forced into the material being drilled. A pilot hole is often made with a smaller drill which, of course, has the same problem, but much smaller. If the peak is not centred the drill will swing around the peak and make the hole larger than it should.

Looking at it from the end, you will see that the drill is thinnest in the middle, so the aim is to have the peak across this part. It is very easy to grind so this peak goes anywhere but straight across. Some drills are comparatively thick in the centre and can be improved usefully by grinding away some of the back of each side.

It is also important to have the two sides identical so the drill will start easily in a punch mark and drill a hole no bigger than it should. There are machines for engineers to handle all the





sharpening with amazing accuracy, but for job drilling you should be able to get respectable results by hand.

Keep practising; you will find that you need a twist plus a push motion to get the best result, which I am sure you will find is far better than with a cheap "drill sharpener".

Chisels and Planes and Screwdrivers

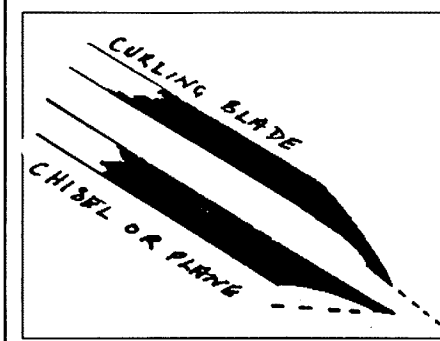
Chisels should definitely be hollow ground, leaving a little for honing. Practise grinding neatly across the blade. Hone finish with coarse, then fine, stone. When removing the burr, keep the blade perfectly flat so you do not put any angle there.

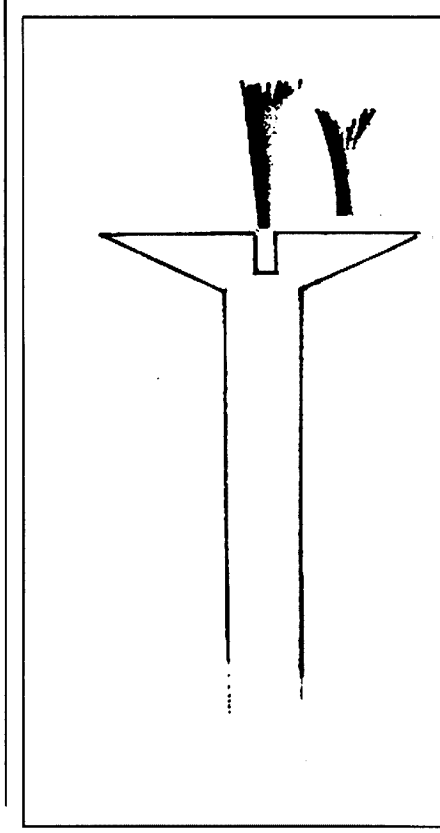
Plane blades are sharpened in the same manner; you will be glad that you spread the wear on your stone as you hone these wide blades. There must be absolutely no wear on the back of the blade.

Also on the blade is mounted a device to curl the shavings while it holds the blade. It also must be sharpened very carefully. The front edge absolutely has to contact the blade or shavings will go under it and jam there. Finish it by honing on the edge of the stone. It should be set about 1mm behind the cutting blade.

Screwdrivers when new usually have a straight taper completely different from the parallel sided shape of a slot in a screw. With any movement, and especially with round-head screws, this 'driver will tend to ease out of the slot and eventually become sharpened to a knife edge (and dangerous).

Hollow grind each side so the end thickness matches the slots for which you use the 'driver, and grind the end square. Don't worry about the burr, it will help to hold the screwdriver in the slot. **ar**





Getting Started with Amateur Radio Satellites

Part 4

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD YARRAVILLE 3013

I WONDER HOW YOU GOT ON WITH RS-10/11? Last month I discussed its orbit, looked closely at the transponders and improved our satellite station to the stage where we could start to make contacts.

This month I'll look at the role computers have come to play in amateur radio satellite communications. In particular, orbital predictions and telemetry decoding and display. Flavour of the month satellite is Oscar-10, the first of the elliptical orbit birds.

In May 1985 I attended a lecture at Box Hill TAFE college. It was delivered by Dr Karl Meinzer DJ4CZ, the "father" of Oscar-10. Karl was on his way to a conference in ZL. All who attended were fascinated by his story of the development of AO-10. Towards the end he reached into his pocket and produced a computer no bigger than a pocket calculator. He pushed a few buttons and told us exactly where Oscar-10 was at the time. This was pretty astonishing stuff in '85. Of course we all wanted one right then. It was some time before they appeared on the retail scene and, in the meantime, Karl's program had been published and was widely used. Eventually we found how to generate the required data to make it run, and many satellite operators came to find these little computers invaluable.

Many amateurs were introduced to the mysteries of computers using one of these Sharp PCP-1200 series devices. Indeed, they're still popular and widely used. Larger machines were very expensive in '85 and, looking back, it's remarkable how the power of computers has increased in the past five years whilst the cost has come down to the stage where $2000 now buys a quite powerful machine.

As better computers became available to amateurs the search began for suitable software, ie programs. The first tracking program freely available to amateur operators was "basic orbits" by Dr Tom Clark W2IWI. Tom is currently President Emeritus of Amsat-NA. He's the Grand Old Man of amateur satellites. His program made us become familiar with terms like Keplerian elements and details of orbital mechanics.

As time goes on many more ways are being found in which computers can aid amateur satellite operators. I'm going to take you through two of the most important this month. They are orbital predictions and telemetry decoding.

All satellite orbits are more or less elliptical. The so-called circular orbit birds in fact have slightly elliptical orbits. Even the geo-stationary orbit of AUSSAT is very slightly elliptical, (0.0002248). Tom Clark's program was based around equations that first calculate the satellite's position around the elliptical orbit and then compared its position with that of the observer on Earth. It then calculates the antenna pointing co-ordinates. To do this it needs to be able to fix the plane of the orbit with reference to the axis of the Earth. It also needs to establish a starting point, the point of closest approach to the Earth or perigee. The opposite end of the ellipse is called the apogee.

An accurate point in time and seven variables have to be entered into the program to describe the orbit accurately enough for our purpose.

I'm not going to describe these variables in detail. There are plenty of books on the subject with as much detail as you can cope with. But I'll name them. They are: Epoch (time), Drag, Inclination, Right Ascension of the Ascending Node (RAAN), Eccentricity, Argument of Perigee, Mean Anomaly and Mean Motion. Other things like object number, orbit number, beacon frequency etc, may be called for, but those eight are the ones that describe the orbit.

The program works on them, giving a starting time and comes up with a series of print-outs giving details of when and where the satellite is in our sky. It will calculate time of acquisition, elevation and azimuth bearings in degrees as well as transponder schedules, Doppler shifts and, in later programs, satellite off-pointing angles. The programs can work out whether the bird is in daylight or not, how much sunlight is falling on the solar cells and all this can be projected into the future up to a year or so for the high-altitude satellites and a month or so ahead for the low-earth orbiters. Eventually, though, the data will become too old to be accurate. All satellite orbits change, mainly due to decay caused by friction against residual atmosphere and gravitational changes. The variables are called Keplerian Elements after Kepler. They are published regularly by NASA which keeps track of all space objects on a daily basis. The figures have to be updated in your program once a month or so. More recent programs like Satfoot, Quicktrack, Graftrack and Instanttrack have very detailed graphics screens showing the satellites moving over a map of the Earth in real time. Some allow the automatic updating of Kep elements from computer files. The latest Keps can be downloaded directly from packet BBSs, edited and auto-loaded into the program. This saves a lot of typing since some programs have up to 200 satellites in their files.

Details of these programs are available from AMSAT Australia. Don't forget to describe carefully the computer you are using as they aren't all available for all types of computer.

Many modern programs will support automatic antenna tracking interfaces. These are devices, usually a small circuit board with relays to control the azimuth and elevation rotators. The computer talks to them via signals through the serial port. In this way your computer can keep your antenna system accurately pointed at the satellite as it passes across the sky. I'm sure that if you've already tried to conduct a QSO through a low-earth orbiter you'll appreciate the advantage of this feature. That is unless you've already grown another two sets of arms.

Now, on to another use for your computer. Amateur satellites use a variety of formats for downlinking their telemetry. The signals are usually FSK or PSK. The transmission is usually FM for FSK and SSB for PSK. Several different kinds of modems or kits are available to decode the various signals. Dove uses an AX.25 type transmission so that it may be displayed directly onto the screen using a

normal packet radio setup. Once you've got the raw data it can be converted into engineering data and formatted to screen using programs like TLM-13, TELEPRO or P3C.EXE. Software is available for the UoSATs from the University of Surrey. This allows you to graph the whole orbit data directly onto screen as it's coming down from the satellite. This is particularly interesting to see up to four graphs being drawn from the downlink data stream. Monitoring telemetry data is a fascinating way of enjoying our hobby. It allows you to keep in touch with the "health" of the various birds and keep up to date with the latest information via the bulletins. These contain details of new satellites, alterations to transponder schedules and latest Keplerian elements. The latest whizz-bang modems from MFJ and AEA are able to decode most satellite telemetry so you can read the bulletins, but you'll need special software if you want to display the engineering data. Or, if you're very keen, of course, you can do that yourself from published formulae.

Our flavour-of-the-month satellite is Oscar-10. It represented the greatest step forward so far for amateur radio satellites. Tragically the first Oscar-10, or phase 3A as it was known during construction, went down into the ocean with all the other payloads when something went wrong with the rocket during launch. This almost called a halt to the amateur satellite program as well as breaking a few hearts along the way. It is a credit to Karl and his team that phase 3B went ahead and was successfully put into orbit to become Oscar-10 in June 1983.

Oscar-10 is in a highly elliptical orbit. Its perigee is a bit over 4000km and its apogee is a bit over 35,000km. The orbit has an inclination of about 26°. Its eccentricity is about 0.6, making the orbit a rather fat ellipse. It has an orbital period of 11 hours, 39 min, 26 sec. This is all rather more complicated than a near circular orbit. It would be very difficult indeed to work out access times, azimuth and elevation bearings etc for Oscar-10 on paper. Fortunately our tracking programs have no trouble as long as the correct Keplerian elements are fed in. When you do this and study the results you'll find that Oscar-10 has a very different track across the sky than any of the previous birds. At times when we see it near perigee it whizzes across the sky rather like a circular orbit satellite, but not along a north/south track. When it is near apogee, however, it will appear to hang in the sky for several hours as its orbit almost matches the rotation of the Earth. Remember that geo-stationary orbit we looked at had an altitude of about 36,000km. This means that when Oscar-10 is out at apogee it almost stays there.

Due to radiation damage, Oscar-10 is now out of control. It switches itself off when the batteries run down and back on again when they charge up. This repeats with the seasons. It also means that only the mode B transponder operates and the antennas are pointing somewhere out into space. All these things and more were controllable before the radiation finally killed the computer's memory banks.

You can still work through Oscar-10, and next month I'll discuss the minimum station requirements. The flavour of the month will be Oscar-10's elliptical successor, Oscar-13. **ar**

Mobile Radio Compatibility Problems in Motor Vehicles

Part 2

BY PHIL CLARK VK1PC

(CONTINUED FROM APRIL 1991)

THIS ARTICLE IS BASED ON A talk given by Paul Bell VK1BX to a meeting of the ACT division of the WIA.

When we met our imaginary amateur "Fred" in Part 1 last month, he discovered some of the pitfalls in providing power to his mobile installation. In Part 2, he discovers some more potential problems including that of compatibility with items of equipment that are becoming increasingly common in modern vehicles.

Part 2

Now when you lift the bonnet (hood?) of the modern car, the engine compartment is so full of wires and plumbing that most of us would not know where to put our eyes, let alone our hands. Added to that, many people do not like to get their hands dirty and they don't like those nasty batteries covered in acid! So they decide that they will do the installation the easy way. Along they go to the local electronic spares shop and buy a cigarette lighter plug. They will obtain the power from a more accessible source. So we plug in to the cigarette lighter and suddenly there is noise all over the place. Why is this? Let's look at this situation as shown in figure 2.

Modern ignition in motor vehicles is a high energy system. It has evolved considerably from the original Kettering ignition of many years ago. Improvements in the form of more energy into the coil, sharper pulses, less ringing, have had profound effects on the vehicle power supply. Because we don't use any more voltage than was used with the early Kettering ignition, the increased energy is made up by drawing more current. This causes noise pulses. The battery may be considered a low impedance source, and so it is, up to a point. Even the best battery still has some inductance, and this means that as the frequency is increased, the impedance of the battery is increased. In one instance Paul made a measurement directly at the terminals of the battery with an oscilloscope and was able to see 1.5 volts of ignition pulses right at the battery terminals.

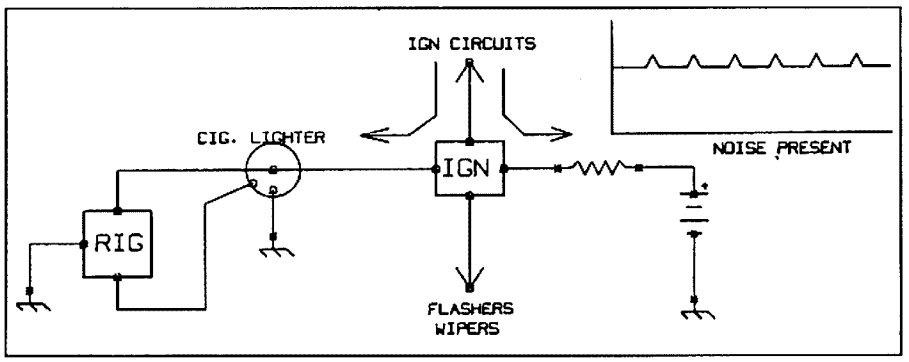


Figure 2: Noise in ignition switched circuits

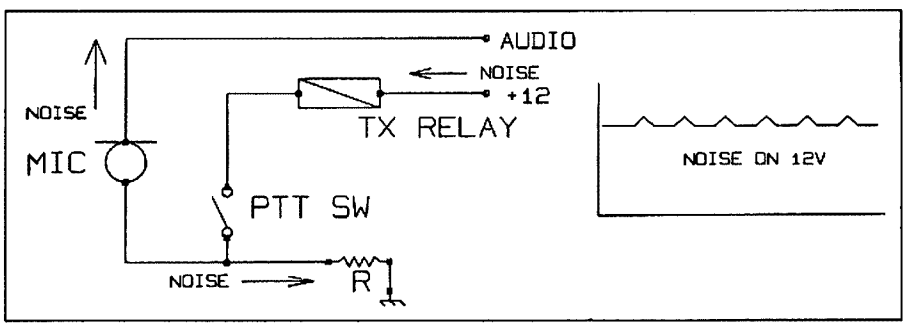


Figure 3: Noise in common circuit coupled to audio

Bear in mind that the construction of your car has been based on critical economic decisions. One of these is to not use any more of that very expensive copper than is absolutely necessary for the operation of the vehicle. Now some of the current supplying the vehicle systems will be flowing in the same circuit that you are using for your rig. As the wiring has resistance, it will cause voltage drops to be developed across that wiring. These will vary with load. This is called "noise", and could come from wipers, turn signals, ignition, fans etc, etc, etc, depending on how the vehicle is wired. **And you are going to connect your set to all of this!!** But, having made the connection via the trusty cigarette lighter socket, how much current is going to be needed when you push the transmit button? A current of 10 to 20 amps is not uncommon with many of todays rigs, and some draw even more. What is this going to do on a circuit that was only just adequate with the normal vehicle load, but which now has to try to deliver all of the extra? As an example, I tried a cigarette lighter connection with my 2m rig in my car and I had 11 volts on receive, but this dropped to 9.3 volts when I pushed the transmit button! And this was only a 25W transmitter! Besides this you have the added "benefit" of all the noise on these circuits! Whether or not your set will be affected by all of the noise comes back to the design of the radio and its power supply. It depends on what the noise rejection of the power supply is like, and some are known to be what can only be described as "abysmal".

Your set may not give any problems on receive because it has a class "B" output stage with good noise rejection, and all of the low level stages are supplied through a regulator. Figure 3 is a simplistic diagram of the transmitter keying of a set.

The audio path is shown with the microphone symbol and has a sensitivity of typically 3-5 millivolts. However, as we had shown earlier, there is already some 250 millivolts of noise with possibly 1.5 volt pulses on the battery supply. Now when the PTT button is pushed, some current will flow, either via a relay or other components, to key the transmitter. At some point in the circuit, this current may flow in a common path with the return side of the microphone. This may take place in the handpiece or later, in the set. The common circuit will have some resistance so that the current flowing will develop a voltage across this resistance (Ohm's law, remember!) which is part of the audio path, and your radio can't distinguish between this noise and your voice, so out it goes! The noise developed needs to be only a few millivolts to be the same level as your voice! This is one of the most common sources of noise injection, generally alternator whine, into mobile installations.

From the above, you can now see that cigarette lighter plugs are really a no-no for a proper installation. Where your radio **should** be connected is to those points as recommended by some of the larger mobile radio manufacturers. Some have a warning printed in large italics at the front of the manual, saying **"Do not connect the negative lead of the radio to the negative terminal of the battery"**. As we have seen, there are good reasons for this. The negative lead should be connected to the chassis of the car, preferably at the point where the heavy lead from the battery and engine connect to the vehicle body. This eliminates the current path from the battery via the set back to the starter and alternator by removing R1 in figure 1 (part 1) from the radio circuit.

Having sorted out all about the negative connections, what of the positive? I have already hinted that connection of the positive lead of the radio to the positive terminal of the battery is the right thing to do, and so it is. But what if that terminal is covered in plastic, as is often the case in modern vehicles? Well, the next best place is the positive battery connection at the starter solenoid. **Do not** connect to the back of the alternator as may be recommended by some well-meaning but ill-informed types! These often use the theory that this is the obvious choice because that is where there is the least loss from the regulated output. However, the output from the alternator is far from smoothed DC because the alternator is a three-phase device with a bridge rectifier and **no** filtering, so that the output is more like a series of pulses, and it is relatively high frequency. Figure 4 shows the waveform at the alternator when the battery is connected. If you put this into the radio, you will certainly get a higher average voltage, but at the cost of increased noise.

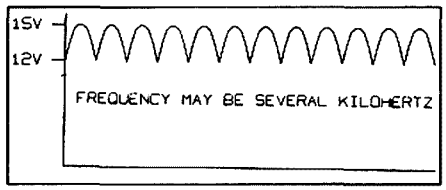


Figure 4: Alternator output into battery

What other sources of noise are there? One of these is common to the "quick-fit" mobile installation. What is this? This is the installation where a "gutter-grip" antenna or similar is used, a cigarette lighter power connection (which never did work the best, anyway), and the set resides on the seat. The "gutter-grip" usually has a good ground to the vehicle body, sometimes better than the lighter connector, so that the main DC connection is via the coax braid. This means that current is flowing in the outer conductor of the coax. There is electromagnetic coupling between the outer and the inner of the coax, so that the noise on the current flowing in the outer will be coupled to the inner, injecting this into the antenna input of the set. This is shown in figure 5. Although the noise may be of low fundamental frequency, much of it may have a very short rise time, so it will contain components well into the operating range of the equipment, and be received as an interfering signal.

Depending on the construction of the set, it may have quite good general rejection of low frequency noise, but be quite poor at higher frequencies. Noise may be injected into the circuits as a result of the incoming power leads running the full length of the chassis inside the case and radiating the higher frequency noise directly into the set internally, either into the audio stages, the IF amplifier or even the front end of the receiver.

The modern motor car has a considerable number of electronic devices in it both for control and running of the car and for entertainment. For example, the one of the popular makes with four-wheel steering has something like seven microprocessors on board. Each micro has its own clock, so there are several possible sources of noise or interference. There is a story of one of the large manufacturers who supplied a new fleet of vehicles to a customer who used low band VHF radio. When the radios were installed in the new vehicles, it was found that they could not be used because the radios were being "jammed". The customer took the cars back to the dealer and explained that the radios would not work in the car. The dealer said that the car was running as it should, so there must be something wrong with the radios. The car (and radio) was taken to a technician who was able to demonstrate that the radio worked except when the ignition was turned on! Tests with a spectrum analyser showed that a whole comb of frequencies was being produced from something in the vehicle. It so happened that a harmonic of the engine management processor fell exactly on the customer's frequency. When they went back to the dealer and threatened to cancel their large order for vehicles, the manufacturer sent out a field team and changed the clock frequency of all the microprocessors in these cars! Unfortunately, while this fixed the problem in this particular case, what happens to other services now that the interference generated by the processors falls on another frequency, as the cars

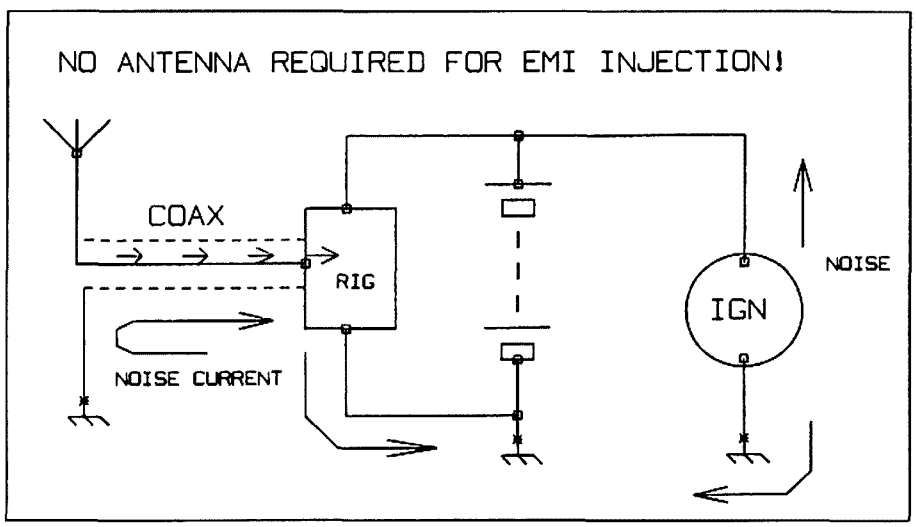


Figure 5: noise introduced onto outer and coupled to inner

drive about the country? It was pointed out to the manufacturer's representatives that there was no shielding at all on the lines into and out of the box, and they said that this was a known problem but that the cost of the few ferrites and ceramic caps to fix it would cost about $2 per unit, and this cost on 100,000 cars was too high. So here is an example of how economics can affect electromagnetic compatibility.

Then we come to the other side of the coin. What is the rejection of this equipment (vital for the control and running of the vehicle) to signals from outside? What happens when the processor responsible for braking or steering cannot get the proper inputs or is overloaded with spurious signals? I don't think I would want to be in the car, but many have little or no protection from such interference! I was told that another amateur in conversation with an electronic engineer from one of Australia's largest car makers brought up the point that some of the instruments in his car went crazy whenever he operated his transmitter from the mobile. The remark from the engineer was telling when he said, "Well, we don't design cars to have radios in them!" Paul relates the story from his days in installation of equipment of the highly regarded imported car belonging to a real estate agent who complained that the car would not run properly after the two-way radio was installed. He was able to prove that the fault was with the vehicle when he could cause the engine to shut down by holding a hand-held radio near the vehicle and transmitting! Needless to say, this caused some quite spirited discussion between the owner and the car dealer, who insisted that their diagnostic equipment showed that there was absolutely nothing wrong with the car.

Earlier in the article, I mentioned that alternators could and did cause problems. The earlier alternators required the battery to be present for excitation to be able to generate an output. The regulators were usually fairly simple, some being just on/off types. Volts too high, output off, volts too low, output on sort of thing, and this generated a pulse-width modulated output to the battery with steps between 12V and about 15V. But, what happens if the battery is disconnected from the system? Suddenly the control has no reference and the output is left full on. Without the load of the battery the alternator might produce 25 to 40 volts! Some will produce even more, up to nearly 90 volts! Obviously, this sort of over-voltage is not good for the electrical equipment in the car, including your expensive radio!

The more modern alternators are self-exciting and generally do not need a battery for excitation, but they still need a reference to be able to regulate the charge to the battery, and this will often be the battery itself. The moral here is to use some over-voltage protection in case the battery connection fails. I am sure that you, like me, have heard some of the horror stories of great expense when the battery has become disconnected while the alternator is operating. It is not unknown for batteries to fail with an internal open circuit, with the same devastating results. The battery is operating in one of the harshest possible environments for a device of this type.

Another problem with modern alternators is the use of very fast switching diodes as the rectifiers. This reduces the heat dissipation and allows either smaller heatsinks in the alternator or a higher rating for the same size package. Unfortunately, these very fast switching devices can create a large amount of RFI because of the very rapid rise and fall times when they switch. This has been noticed particularly in diesel vehicles where ignition noise is not usually significant. It appears to be common practice in the vehicle manufacturing industry to give little or no consideration to the electromagnetic compatibility problems that may result from economic considerations until they are threatened with financial loss or severe safety problems.

When looking for that noise, or why the vehicle is affected by an RF source, don't forget those little tricks that the manufacturers try just to make things hard for you. These are things like panels not electrically bonded to the rest of the body so leaving a great big "hole" for RF to get through. And what about those non-metal panels? I heard the story of one amateur who mounted an antenna on an outer panel of a modern vehicle and found that he could not get a good "earth". He decided to scrape some of the protective coating away to get a good connection and, after scraping for some time, realised that he had gone further than the coating and that the panel was not metal. Remember, when working on a vehicle electrical system, **always** safety **first.** If you are going to disconnect the battery, remove the connection to the **body** before any other. If the battery is disconnected, do **not** run the alternator, it can generate very high voltages. The ignition systems can have voltages that are lethal, on both the primary (up to 400V) and secondary (up to 30-40kV) sides, so take care around them.

In spite of all this, it's a wonder that radios work in cars at all, isn't it? And it's a wonder that the vehicle's electronics don't collapse in the vicinity of a toy hand-held. So, good luck and happy mobiling! **ar**

Anti Gulf War Packet Radio Message

The United States Federal Communications has fined three radio amateurs and warned eight others for violating regulations which prohibit the transmitting of commercial messages. The FCC took the action after a complaint about a packet radio message which appeared on numerous bulletin boards.

The message urged radio amateurs to call a telephone number sponsored by the National Coalition to Stop US Intervention in the Middle East, based in New York, and to register opposition to the war. Each call to the phone number results in a $10 charge on the caller's phone bill — with $5 going to the Coalition. The message spread throughout the packet radio system and was eventually read by a radio amateur who was a Captain in the US Navy. He promptly complained to the FCC.

No one has admitted to sending the original message, and the Coalition had denied knowledge of how the message appeared on the amateur radio packet system. A radio amateur in Pennsylvania, whose callsign was on the originating message, claims his call was pirated. But the FCC has still imposed a $300 fine and warned him in an official letter that his amateur licence would be withdrawn if he continued to violate the regulations.

The incident had sparked debate in the US that the FCC could stifle the new packet radio technology by asking its users to read every message before their own station relays or places it on a BBS. American Radio Relay League executive vice president, Dave Sumner K1ZZ, says if such a move happened it would destroy the function of the packet radio network system.

In Australia a voluntary Code of Ethics has been adopted by many BBS operators with certain types of messages being filtered out of the system. **ar**

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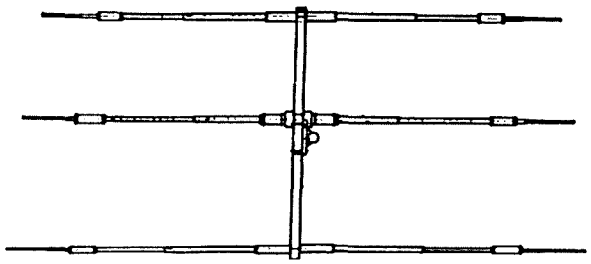

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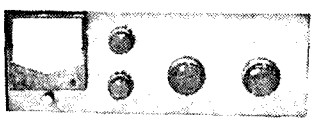

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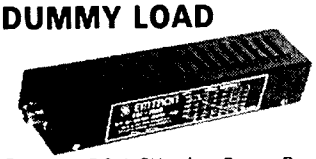

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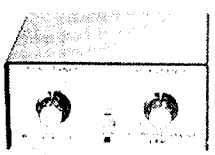

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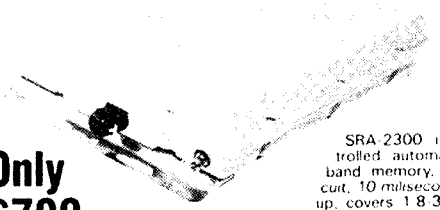

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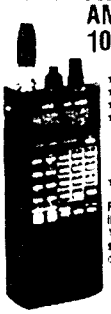

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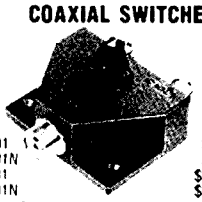

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FETs as RF Amplifiers

MIKE MURPHY VK6KRO
11 KYLIE ST, WEMBLEY DOWNS 6019

TWENTY-FIVE YEARS AFTER their introduction, it would be fair to say that FETs are rarely used by radio amateurs except as VHF preamplifiers.

This is unfortunate, as they offer many advantages when used properly.

Why aren't they being used properly now? Well, this is due to a generally held belief that they are fragile and easily blown up, and to a belief that they are like valves and can be used in valve circuits.

Modern FETs are very rugged, especially if they are used in circuits that provide an easy path to ground from their gates. This means that circuits which have just a coil from gate to ground are preferable to ones that use 10Mohm resistors. I have never blown up a FET and I have used dozens of them.

The belief about FETs being like valves was never true. You can put them in valve circuits but they won't work.

If you put a FET into a typical valve IF amplifier circuit, it will oscillate. This is why you don't see many articles about people doing this, despite the number of old valve receivers lying around.

Why is this?

If you ever tried to build amplifiers using valves like the 6AC7 or 6EJ7 you will know what fierce little beasts they were. This is because they had a high gm and enough plate to grid capacitance to make them unstable.

FETs have gms of up to 30mA/volt (much higher than almost any valve) but more drain to gate capacity than most triodes.

This would make them just about useless except for one thing: they have a **low output impedance.**

If they are used with a low impedance load they are quite stable. This is because the FET itself is being used in a low gain configuration.

So, What Good is Low Gain?

The secret is that if the FET can turn a high impedance to a low impedance, then tuned circuits can provide most of the gain needed.

If you look at figure 1, you will see that this circuit (a perfectly practical preamp for 21MHz) has a 330 ohm resistor as a load and hence has a gain of about three

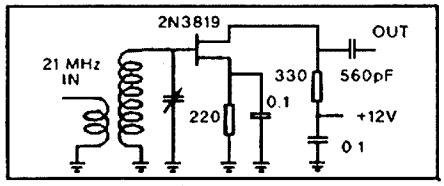

Fig 1 Pre-amplifier

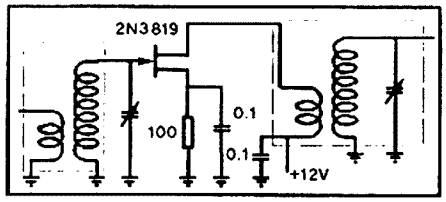

Fig 2 IF Amplifier – RF stages are identical to this

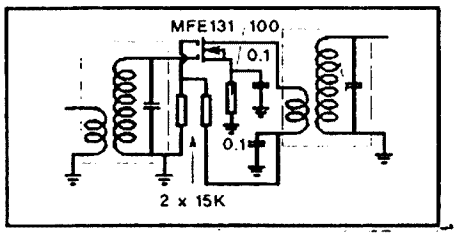

Fig 2D Dual Gate FET IF amplifier

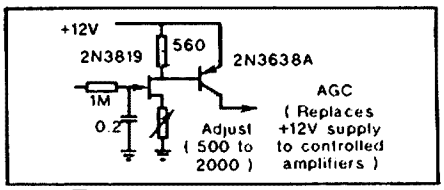

Fig 3 FET AGC Amplifier

(the FET has a gm of 10mA/v).

This would not be worth building by itself, but note that there is a step-up transformer in the tuned input. This is unloaded due to the high input impedance of the FET so it provides an extra gain of about seven.

A voltage gain of 21 is thus achieved without the FET getting a chance to oscillate. This is 26dB or over four S-points.

I use this amplifier on 21MHz and can claim a big improvement in receiver performance for weak signals. The S-meter certainly shows the difference, too. No more "Q5 but no meter movement" reports.

Another example. If you look at figure 2 you will see the idea. Normal transistor radio IF coils are used **backwards** and driven from what is normally the secondary.

The transformers thus provide a step-up in voltage and most of the gain of the amplifier.

The FET is basically there to provide an impedance change. This is power gain, of course, and I don't mean to belittle it.

I built a 455kHz amplifier using MFE131s and IF transformers from Dick Smith's (the white-cored ones in the packs) and, without any special tuning, got a gain of 10000. This was using only two stages and it was absolutely stable. A gain of 10000 will turn 10 microvolts into 0.1 volt! This is most of the gain needed for a receiver.

I have a receiver which uses three of these stages (to make up for a lossy filter) and it is completely stable.

Construction of such amplifiers is not difficult. Normal VHF techniques of mounting all components close to a continuous copper or brass plate and bypassing to the nearest point on it are used. Straight-line signal paths are always a good idea, too; ie don't bring an output back near an input.

I always build this way, so I don't know what would happen if you did it some other way.

What about RF Stages and Mixers?

Well, it is just the same circuit repeated over and over. Step-up transformer in and out.

The mixer is usually a dual-gate FET, so the oscillator can be injected easily. Basically, the variations are just to cope with the frequencies used.

RF coils generally have a 1:5 step-up ratio. The secondary (the larger winding) is resonated at the frequency required using a variable capacitor.

What about Automatic Gain Control?

This is actually the best bit. I tried everything I could think of before I realised how easy it is.

FETs work well at 12 volts, but poorly at lower voltages. The funny thing is that "poorly" just means lost gain, **not** distortion.

I did lots of experiments on this and

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A Piece of Wire

ROBERT R MCGREGOR VK3XZ
2 WILTSHIRE DRIVE, SOMERVILLE 3912

ROBERT MCGREGOR IS A champion of famous pioneer physicist and mathematician Clerk Maxwell and an advocate of the sometimes neglected Marconi antenna. Maybe his views can spark a new line of thought on your choice of radiator. He also outlines construction of a potentially useful RF current probe.

Clerk Maxwell's mathematics and knowledge of electricity were excellent. When approached on the matter of the failure of electric signalling over long distances he solved the problem with the addition of loading coils and, as a result, telegraphy spread in many countries. Could he solve a similar problem and make the construction of an Atlantic cable possible? He did, continuously loading the wire with a magnetic tape. Shortly after, another undersea cable reached Darwin where, linked up with the Overland Telegraph, Australia moved from 90 days to 90 minutes from the rest of the world. DC was fine, but what about a varying current? Maxwell's mathematics were equal to the task, and (in 1865) they did reveal one strange thing: if you have a varying electric field acting in the same space as a varying magnetic field at right angles to it, a new component, with both fields, was generated in a direction at a right angle to the other two **and was radiated!** He called this electro-magnetic radiation. Hertz demonstrated it practically (1888); Marconi showed its commercial possibilities; and amateurs made it their hobby.

Wire is very flexible and easily bent. However, the fact remains that you get maximum radiation from it if you keep it straight. You can, of course, change direction where there is no current (a current null). This has produced a multitude of antenna designs for special purposes, or maybe no purpose at all but to satisfy the inventor! You can, by terminating a wire that is horizontal and parallel to the earth, set the conditions for a steady current flow. Yes, Beverage came up with this design and it is used on VLF — a couple of miles long and uni-directional! Half the power is radiated and half dissipated in the terminating resistor. Terminated Rhombics and "V" antennas are in this category.

Amateurs usually employ a mix of a Marconi vertical antenna worked "against earth" or Hertzian dipoles, which can be in any position relative to the earth. Whether a Marconi is half a Hertz or a Hertz is two Marconis back to back is a fine subject for a chat session, but it is worth a thought about that piece of wire that performs the "magic" of radiation.

It is easiest to start, as Marconi did, with a short length of wire working against earth. We do tend to sheer off this concept — the problem of the earth, you know — and then go out with HF mobile! However, land, marine, air and broadcast services all use versions of the Marconi.

Somewhere above 2MHz, where amateurs were consigned, the physical dimensions of a Hertz became "compatible" with a house block and we were hooked. The credit for the discovery of HF DX sort of washed off on to the Hertz when, in fact, the superior low angle radiation of a Marconi is better for DX! This was "rediscovered" with the ground-plane.

At present there is a widespread tendency to keep our antennas at a distance on a piece of coax — I wonder if this has reduced our relationship with the only **essential** part of our station. Everything else is an auxiliary; the prime one being the source of RF energy. Okay, energy sources do leak and radiate to everyone's sorrow.

Let's rediscover our antenna basics — 20ft or 6m of height is sufficient; I used 30ft on 160 and still worked four states on 2 watts! The support is preferably non-conducting to prevent confusion of both the signal and the experimenter. Pipe, as a top section, on a post is okay, but requires a substantial mount. A bush fishing pole, bamboo or fibreglass (F/G) rod have all worked well. The F/G rod has the advantage that you can wind coils directly onto it with minimal loss. One such, with three spaced coils, was very effective for marine use from 2.5 to 6.5MHz.

Now you can make that textbook stuff come to life and experience a "hands on" feel for our hobby. Instrumentation can be expensive, but what is ham radio but a licence to do it a bit more simply! Basically you need an RF current probe to detect what cannot be seen. A handy tool in this regard is an RF current transformer, diode, capacitor and DC meter on a suitable mounting. The secondary of the current transformer is a small air core toroid mounted on an insulating rod. It has an opening for a "wire" to be inserted, this becomes the transformer primary, to have its current checked. A dozen turns on a pencil is a good starting point, with a diode and capacitor to suit the frequency in use. You control the meter sensitivity with a shunt, but if the signal is too great, add series resistance between the shunt and the meter. If you are extending the DC leads from the diode along the rod/handle to a distant meter, then a couple of ferrite beads will reduce hand capacity effects on your measurements.

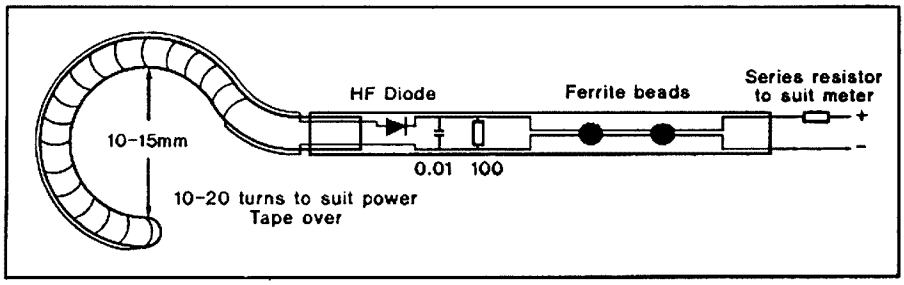

Fig 1. RF current probe
A fishing rod makes a convenient extension. Thread the twisted meter leads and, at the handle, make six to 10 turns around it to form an RF choke before connecting the meter.

Fig 1 Basic circuit

This unit can be used to check an antenna current pattern, open wire lines for standing waves and is suitable for checking the sheath of a coax line for currents fed back from the antenna. A few turns of the coax feeder through a ferrite toroid or around a rod, at the aerial, will usually cure these "stray

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220 Volt Devices

BILL TOUSSAINT VK6LT
9 DESFORD CLOSE, SHELLEY 6155

IT IS ALWAYS A NICE FEELING to get a bargain. I remember the valve tape recorder I bought in Hong Kong in the early 1960s. It was clearly marked "220 volts". I knew the West Australian voltage was 250 volts at the time, but when I pointed this out to the salesman he replied that he "could guarantee it would work on the West Australian current".

The two-pin plug connecting the recorder had parallel pins. This was easily overcome, he said, "by bending the pins with a pair of pliers so that they would fit the Australian outlets".

To some extent he was right. The recorder DID run on the 250 volts and his trick of bending the two-pin plug to fit Australian outlets appeared feasible. Despite it running a little warm, I generally had good use out of it.

With the benefit of hindsight, increased age and a little more knowledge about electronics, it is timely to reflect on the wisdom in buying such "bargains" overseas.

Even though there is now a policy in Western Australia to reduce the nominal supply voltage from 250 volts to the 240 volts used in other states, it is still not advisable to run 220 volt equipment even on 240 volts.

For the 220 volt tape recorder (or other 220 volt devices) some people have advocated + or - 10 per cent of this voltage as a rough rule of thumb for the "correct" operating voltage. On the basis of 220 volt devices, this represents a range of 198 to 242 volts. At first glance this seems to suggest that the nominal 240 volt supply will be just within this range. Or will it?

The supply voltage of 240 volts is only a nominal voltage and, depending where you are located with respect to the electrical reticulation feeder, could be higher or lower than 240 volts. This means that the 220 volt equipment will be running warmer than it perhaps should be, with a reduced reserve in the event that the supply voltage increases. The net effect will be to put the equipment at risk and to perhaps shorten the operating life of some of the components.

The "bending of the two-pin plug to fit Australian outlets" is not only undesirable, but also unlawful. With this modification it is almost impossible for the plug to fit neatly into the outlet without exposing some of the metal of the pins. This provides the potential (no pun intended) for small fingers to touch the live metal pins. There is also the two-to-one gamble that switching could be on the neutral line, if this were not checked beforehand.

Another 220 volt device which I recently came across was an adapter for people who travel a lot between countries having different voltages and who use 100-115 volt equipment (electric shavers, for example). The concept is good. No matter where the user travels, if the adapter is used, it automatically changes the voltage to suit the 100-115 volt appliance.

The one I saw was rated at 150 VA and had a variety of plugs and connectors. It could, therefore, fit the various outlets encountered in different parts of the world. A diagram of the circuitry used is shown in figure 1.

If the input were plugged into a 220V AC supply, there would be sufficient current through L1 to activate the relay and cause the supply voltage to be switched to the 220V tap of the auto-transformer. This would result in a 100V AC output from the 100V tap.

On the other hand, if the input were plugged into a 120V AC supply, there would be insufficient current flowing through L1 of the relay to activate it. The supply voltage would thus be switched to the 120V tap of the auto-transformer, giving rise to an output voltage of 100V AC from the 100V tap of the transformer.

Thus, irrespective of whether the input were 220V AC or 120V AC, the output voltage would still be 100V AC.

The concept is good, but is it really safe for the operator and the equipment? What would happen with a 250V AC instead of 220V AC input? What if the neutral and active are swapped due to the use of parallel pin plugs? What about that instant when the unit is first switched on when connected to a 220V AC (or 250V AC) supply while connected to a 100V device left switched on? What is going to happen when it is connected to a 600W iron?

With some of these questions (and answers!) in mind, the "bargains" one gets may not necessarily be a bargain, particularly if it damages your valuable 100V stereo system that you also bought overseas but wish to use in Australia! In addition, as well as not complying with Australian standards (and hence being illegal), some equipment may compromise safety.

The take-home message is that it is often necessary to check some of the electrical equipment that is available overseas, preferably before buying it. The checking should include the studying of the circuit diagram (if available) and the checking on the equipment's compliance with Australian standards.

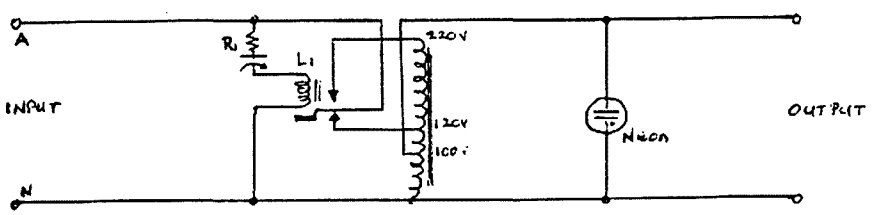


Figure 1: Circuit of the 220 V/100 V adaptor

Stolen Equipment

Tuesday 3 April the Lower Eyre Peninsula Amateur Radio Club was broken into. Removed from the radio shack were: Kenwood TS520SE HF transceiver, s/no 8650; Kenwood TR7200G 2m transceiver, s/no 111048; Kenwood 309VFO to suit TR7200G, s/no 440168; Philips FM828 VHF transceiver/channel 147.575 Pac Comm TNC tiny 2 and manual, s/no T5359; Commodore 64 computer (new); Commodore 1541 II disk drive (new). Both the computer and disk drive were engraved with the initials of the club, LEPARC in bold letters. Contact LEPARC, PO Box 937, Port Lincoln 5606.

The Horizontal Loop

(The best kept secret in amateur radio circles!)

JOE ELLIS VK4AGL
BURNSIDE RD, NAMBOUR 4560

IN 1990 I WAS LUCKY ENOUGH to make it to the Dayton Amateur Radio Convention in Ohio USA. Whilst there I picked up a copy of the *ARRL Amateur Radio Handbook,* 1990 edition, and browsed through it during a long and dreary flight back across the Pacific to Australia. I finally came across the chapter, "Antenna Projects", and noticed glowing reports on the use of full wavelength horizontal loops; indeed the author said that they were "the best kept secret in amateur radio circles".

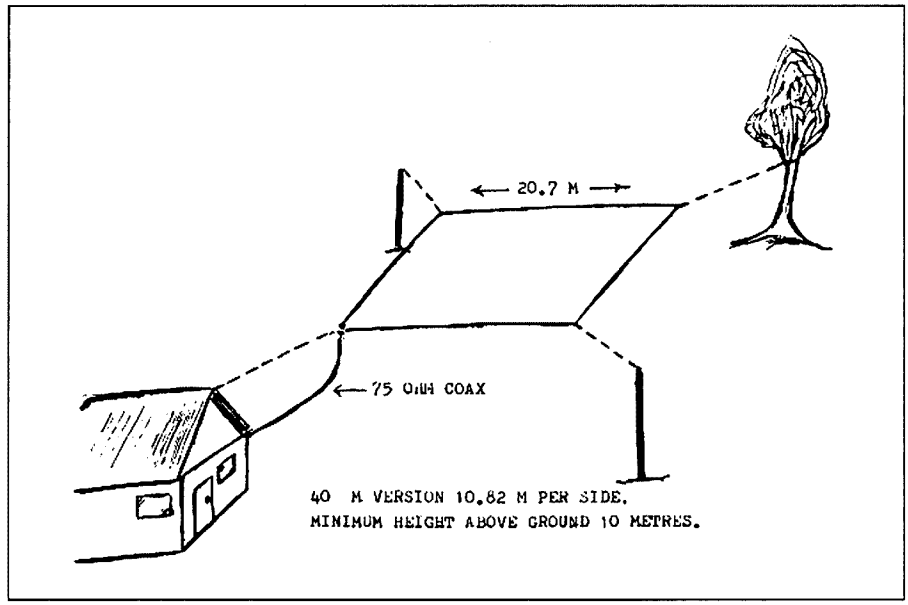
It reminded me that I had a collection of articles and correspondence on this type of antenna, gathered over a long period from contacts in the United States and Europe. There and then, crammed amongst 400 other unfortunate travellers enduring what passes for air transportation these days, I resolved to make it a project for the year.

The first reference to the use of these loops came to my attention from an article in *73* magazine, June 1978 issue. A German amateur DL3ISA took 83 metres of antenna wire and mounted it in the form of a big quad about 10 metres above the ground in a horizontal position. Each leg was 20.7 metres in length, and he fed it with 75ohm cable of random length from one of the corners, as shown in the accompanying diagram. He noted that the preferred propagation occurs off the extensions of the quad's diagonals.

In 1985 Dave Fischer W0MHS reported in the November issue of *QST* that he had used this type of antenna since 1957 in many locations and that it was a "magnetic" version of the old super Skybuster, the open-wire, centre-fed, "electric" Zepp that had performed so well for decades. Subsequently, Curt Wilson W0KKQ wrote in *World Radio,* September 1986 issue, under the heading "A Closer Look at Horizontal Loops", some interesting comments about the "re-discovery" of this super antenna which had been there all along. So much for the background.

Construction

The erection of a loop at my own property proved to be easier said than done. A Rhombic was already in use but although I was prepared to dismantle it, the diamond configuration of the poles did not allow a quad shape without an extremely long feed-line. So, the first opportunity I had of personal experience with the loop came when a mate, Tony VK4AJB advised that he had bought a few acres of land east of the city of Gympie and wanted some ideas about a suitable all-band antenna. I sent him the paperwork and arranged a weekend visit to assist. We finished the job late on the Saturday afternoon, after an expert bow and arrow performance by VK4AJB, shooting fishing line up over the selected gum trees and drawing up the necessary ropes to hoist this secret weapon. It was the middle of the Queensland winter and the sun was already low in the western sky when we adjourned into the "carashack", an old caravan used as our headquarters. As I sipped s Scotch, I reflected that I would probably cop a lot of stick if this thing didn't work as I had promised.



The auto-tune facility on the Kenwood TS440 resonated the 80m band followed by 40, 30, 20, 12 and the 10m band. It refused point blank to have anything to do with the WARC 18MHz allocation. Our first contacts were on 20 metres, and each station called responded promptly with reports of S6 or better. We spoke with a number of DL stations and checked in on the South American DX net. Transferring our operations lower in frequency we had good reports on 40 and 80m and, as the evening wore on, it became clear that this was a good all-band antenna and a pleasure to use. We had a brief QSO with one of the northern NSW stations on 160m, and finally plugged the antenna into the 2m mobile FM transceiver and raised the Sunshine Coast Repeater System some 40 miles to the south.

Subsequent weekends have proved the value of the horizontal loop as a cheap, easy-to-erect all-band antenna. We have since experimented with a full wave loop for 160m, but results have been inconclusive at this stage. Also, we made a trip to the Gold Coast and put up a 40m loop for Colin VK4AGH, who has been more than happy with the results. This antenna at 35 feet per side might appeal to those who are short of space. The formula for these loops is given as 306 divided by the frequency in MHz, or, for the oldtimers, 1005 over F, giving the answer in feet. Be prepared to cut off a couple of metres due to these formulae being for loops over clear earth. Thwarted at putting up a large quad loop at my own location, I have erected a horizontal delta loop 81m in circumference and fed via a 4x1 balun and 50ohm coax. It is too early to really comment on this configuration but it listens quite well and operates on all amateur bands. However, this shape might suit other operators as only three masts are required. Since the performance of a loop depends partly on the total enclosed area, then obviously we cannot expect the delta shape to be as good as the quad referred to in the original articles. ar

Television in 1932

LLOYD BUTLER VK5BR
18 OTTAWA AVE
PANORAMA 5041

TODAY WE ACCEPT OUR high-quality television, beamed by satellite all around the world, as a fact of life. The technology is not really all that old, and I thought it would be of interest to reproduce the following article taken from the February 1932 issue of Key Klix, the official organ of the historic Blackwood Radio Club. The article describes television as seen at that time by club member Harry Wheeler VK5HW.

The last paragraph is quite interesting in which Harry made reference to potential experimentation by the radio amateur. As history has unfolded, I think our ATV experimenters have well accounted for themselves, particularly those who in earlier years built their own TV equipment from bolts and nuts upward.

Television

by **H W Wheeler**

There has been much talk of television lately. This subject appeals to many radio experimenters, for the idea of transmitting and receiving moving pictures is certainly fascinating. However, there seems to be some doubt as to whether television at the present time is really practicable, and whether the construction, control and expense of the apparatus required are within the means of the average experimenter. Consequently, few have actually taken up the subject.

Furthermore, it seems that many enthusiasts do not clearly understand what is meant by television; the term is apparently veiled in mystery, and can mean all sorts of wonderful things. What does the average person understand by television, and what does he think of it? Many who are asked this question will say they have read glowing reports on it, that it is "wonderful" and that the time is coming soon when we shall be able to sit by our firesides at home and watch Test matches in England. Some people say that television is in its infancy, others say it is just around the corner, and still others declare it is an accomplished fact. Many persons, in speaking of television really mean transmission of still pictures, which is quite a different thing. Often do we hear the remark over the telephone, "Thank goodness we haven't got television on our 'phone yet." One man who was consulted on this question revealed the startling fact that many wealthy people have television discs attached to their private telephones. Another man, in giving his opinion, summed up the situation fairly well. He said that what he had heard about television was hard to believe; but then anything was possible with modern science. The general public has seen so many things accomplished that the previous generation considered impossible that it will now believe any marvellous thing provided the words "modern science" are tacked on to it.

Evidently the television situation is rather obscure, and the purpose of this article is to attempt to clear up some of the confusion in readers' minds. Is television a practical success? If by television, telephotography or transmission of still pictures is meant, then the answer is "yes". Reproduction on paper of pictures at a distance, by wire or by radio, is a definite success. It can be carried out by several difference processes: the Siemens-Karolus, Bell Telephone, Ranger and Cooley Rayfoto being amongst the methods employed. But by television we mean seeing actual events and moving pictures at a distance, and whether it is a practical success can be judged from the following brief description of its operation.

The pictures or scenes to be televised are scanned by a spot of light which runs over the whole picture at least 10 times a second. The reflected light is picked up by a group of photoelectric cells whose output is amplified and then is used to modulate the transmitter. The receiver has a neon lamp connected in the output, which is viewed through a revolving scanning disc. This disc usually has 48 holes arranged spirally, and gives a picture one-inch-square, containing 48 x 48 or 2,304 dots. The speed of the motor driving the disc must be very carefully "synchronised" with the transmitter scanning disc, so that the blinks of the neon lamp are viewed in the right spot. This is not a very fine picture, so let us see what difficulties have to be overcome in order to effect an improvement in this system.

Newspaper half-tone prints contain about 6,000 dots to the square inch, and this should be the minimum in a decent televised picture. Being content for the present with a one-inch picture, that means that the neon lamp must blink 6,000 times for each picture, and if the pictures are sent at the rate of 16 a second, there will be 96,000 impulses a second through the neon lamp. The transmitter will have to be modulated by frequencies varying from zero to 96 kilocycles and of varying amplitude. Now, if the transmitter is working on a frequency of 1,000kc (300 metres) the sidebands will extend from 274 to 332 metres. To receive this broadcast, extraordinary bandpass tuning circuits would be required, and also the audio amplifier would have to give linear response to an enormous band of frequencies, mostly abnormally high. And all this trouble gives us a picture one-inch-square the colour of a lighted cigarette end, and which requires superhuman skill to hold in synchronism. Also, the broadcast can be received only at short distances where it has good strength and there is no selective fading. To obtain a similar picture 10 inches square, the apparatus would have to be capable of handling nearly 10 million impulses a second, and an oscillator to be effectively modulated by such frequencies would have to work on waves below one metre. Needless to say it is impossible in practice to obtain the conditions required for good scanning. Scanning discs, although interesting and worthwhile to the experimenter whose chief delight is in his experiments and not in artistic results, will never be a thorough success. When television ultimately does become a success, some entirely different principle will be its basis.

The publicity given to television development has unfortunately been out of proportion to the results achieved. Actual progress has been slow, and probably in the wrong direction, but the publicity has gone ahead in leaps and bounds. The heads of the television concerns know that when radiovision becomes a success there will be an enormous rush to buy sets, and they are anxious to be in early and amass some wealth. Technical problems are subordinated to the problem of how to get rich quickest. Television has been thrust prematurely into the limelight, and to rouse public enthusiasm many misleading and exaggerated re-

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Amateur Radio In Hungary Today

STEPHEN PALL VK2PS
PO BOX 93, DURAL 2158

The year was 1938. The place: somewhere in mid-eastern Europe, in Transylvania, the region which was, and still is, in the international news today.

My friend Alex and I were trying to tune a homebrew Hartley oscillator and a Marconi antenna. After many hours of experimentation, the faint glow of a small bulb indicated that the circuit was resonant. Little we knew at that time that amateur radio would bind us into a long-lasting friendship which even today manifests itself in regular CW skeds. Both Alex and I have changed prefixes, but the love of amateur radio still binds us together over the vast distances in our chosen new homelands, HA and VK.

A little time ago Alex wrote me a long letter in which he described the changes which have taken place in the Hungarian amateur radio scene. I want to share his letter with us all.

"As you well know," writes Alex, "the technical sports in Hungary, like motor sports, private or sports flying, gliding, modelling, target-shooting, sailing, sea-diving and amateur radio were directed and controlled by a Soviet-style Defence Association, which association was part and parcel of the Ministry of Defence. The leaders of the various sub-organisations were pensioned former army officers, and the main object of the whole movement was the pre-military training of the youth in the spirit and dogma of communism.

"Amateur radio as such was a secondary issue. This control system had only one positive advantage: enormous amounts of government money were spent on city and country radio clubs, in establishment, equipment and maintenance costs, including wages for paid administrators.

"When the former communist party secretary and "boss" of Hungary, Janos Kadar, started to liberalise the life of the Hungarians, the ranks of radio amateurs increased considerably due to the existence of well-equipped radio amateur clubs. However, at the same time there were a strict selection criteria which determined who can become a radio amateur. Between the years of 1945 and 1955 only army officers, policemen and senior party apparatchiki could become radio amateurs. After 1956 (the Hungarian revolution) anybody had the opportunity, provided he or she had an "acceptable" political past. If one had relatives living abroad, or if one's father was a former (before 1945) army officer or a former "important" public servant, you had no chance of a future radio amateur life," writes Alex.

When the communist system finally collapsed at the end of 1989, "we immediately established a new independent Hungarian Radio Amateur Society (MRASZ)," writes Alex. "We had elections in each county (Hungary has 19 administrative counties, and five cities with independent status). Regional leaders and delegates were sent to the "founding" general meeting from all over the country and, in December 1989, the new national committee members were elected. It has to be mentioned that the "old" MRASZ was only a phantom organisation directed by the state and the infamous Defence Association. The old society nominated its leaders, there were no members, there was no yearly budget, and its only role was to represent the Hungarian radio amateurs at the IARU organisation, because the soldiers, the real leaders, were not permitted to have physical contact with the "western foreigners".

"The new society has no connection whatsoever with the Defence Association, which itself was to be dissolved in September 1990. Ninety per cent of the new leadership has an electro-technical background. There was a move by a small dissident group to form an "opposition" movement with the view of "rescuing" the considerable assets of the clubs into a new centralist body. The radio clubs were immediately advised to have themselves incorporated as independent bodies and claim the club assets and equipment as the legal "heirs". This advice was very much supported by two members of the Hungarian Parliament, who are radio amateurs. As a result, the assets were passed over to the individual clubs as a gift from the Defence Department.

"Starting is very difficult for a new amateur radio society. There is no more government monetary assistance, only annual membership fees. The first six months of the new society were spent in membership recruitment. To become a radio amateur is now part of the right of the citizen. There is no compulsory membership as a prerequisite, and there are quite a number of amateurs who did not join the society. Those are the free-loaders *(Familiar scene? Ed)*. The new society is now accredited by the respective branch of the Post Office as the official representative body of Hungarian radio amateurs and also by the Region I of IARU (International Amateur Radio Union). There are, of course, a few amateurs who want to establish new opposition groups; they criticise the present leadership, but they are unwilling to contribute with their voluntary work for the common good of the amateur radio community.

"There is a radio-electronic magazine called *Radio Technika* where the amateur news appears in a separate section, unfortunately with a delay of three months, because of deadline problems. However, an internal news bulletin (the editor of which is my friend Alex HA5HR) is sent to each county sub-association. It contains the latest administrative and other amateur news, contest, local club and international news and news from IARU. This news bulletin appears in a photocopy format, only 50 copies. There is now a monthly news broadcast over three UHF repeaters, and another publication called *Klubmagazin* which has a radio amateur segment.

"There is now a very good relationship with the Austrian and German radio amateur societies," continues Alex. "There is a Hungarian QSL Bureau, a Contest Bureau, which collects, dispatches and receives contest logs for international or Hungarian contests. There is an Award Committee, and an HA DX club which has as members the best DXers, and issues its own diplomas. There is an excellent fox-hunting team with a trainer and captain. The national headquarters radio station is well under way, to go on the air with the callsign HA5NHQ. Hungary at present has 4000 licensed amateur radio stations, and a further 2000 operators who do not own their stations, but are active through the radio clubs. Mot of these come from the CB ranks, and operate on UHF bands where they don't have to pass a Morse test. (Note: Hungary is situated in the middle of Europe. It is small, covering 93,036

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JOTA — First Healesville Scout Group

Operation by Healesville Amateur Radio Group (HARG Inc)

DEREK THURGOOD VK3DD
BOX 234
YARRA GLEN 3775

AT THE INVITATION OF THE First Healesville Scout Group, HARG was to set up a station at the Scout Hall for operation during the Jamboree of the Air (JOTA) weekend 20-21 October 1990.

During the weeks preceding JOTA lists of equipment requirements were prepared and "rosters" for the weekend made up.

The weekend before JOTA a small group from HARG met at the Scout Hall to test the antennas to be used for the exercise — a three-element duoband Yagi for 10 and 15 metres (Hy-Gain 1015A), a Diamond multi-band trap vertical and various wires (inverted vee, 20m Delta loop, 80m dipole). The Yagi, which had been stored at the writer's QTH for some time, showed promise after the cobwebs were brushed off, and it was hoisted some 35 feet up on an extensible Hills TV mast. (Good signals to JA and P29 on both 15 and 10m). Some difficulty was experienced with the vertical in the position tested, although all present were confident that it would be okay for 40 and 20m with the addition of ground radials (this subsequently proved correct, with good reports in VK on 40 and 5/8 reports to West Coast US on 20m). The Delta loop was known to be okay, as it belonged to the club's resident antenna experimenter (Lyn 3DKE). Some difficulty was experienced in tuning the inverted vee, and considerable time was spent until the fault was found (who was on the roof of the Scout Hall watching uncovered wire at the feed point rubbing against the gal pipe mast? — maybe Neale 3BOS can answer this).

Despite these small hiccups we were all confident that the weekend of JOTA would go smoothly and a time was organised to meet, check equipment and set up (0830 local Saturday 20/10/90) at the Scout Hall.

The enthusiasm was somewhat dampened on Friday evening (19/10) when the heavens opened and the forecast was for a rather damp set-up period on Saturday (was it then that Graeme 3KGT lived up to his callsign "Cagey-T" and un-volunteered for Saturday set-up?)

As it turned out, Saturday morning dawned fine and sunny in the Yarra Valley, and Derek 3DD, Lyn 3DKE, Jon 3PJD, Russell 3VSP, Ron 3TIW and Gavin set about getting gear together and hardware in the sky. No real problems, and the club's TS520S an the Hy-Gain Yagi had no trouble making first (non-JOTA) contacts with WD0CBT Larry in Coffeyville, Kansas, and VK4AAU Bob in Mackay, Queensland, at around 1000 (local) on 10 metres.

Of course, now we were set up, other club members turned up to help with the really hard work of enjoying the weekend with scores of local youngsters.

The equipment on hand (besides the antennas and the very necessary coffee) included the club rig TS520S, a TS440S (Steve 3MAS one of the Scout Group leaders). Yaesu FT707 (Lyn 3DKE), TS120S (Jon 3PJD), numerous VHF and UHF "handies" and a number of items for a static display — FT902D (Jon 3PJD), FL100 TX FR200 RX (Gavin), army-style Morse code oscillator (which the club uses for training), QSL cards (on loan from Jon 3PJD) and various items of club (and general) PR material.

Over the weekend there were some 40 or so youngsters and varying numbers of mums, dads and leaders in attendance (one mum, who doubles as a reporter for the local paper, was eventually convinced that, in order to write an accurate article she would need to spend some time "on-air". Finally Kath was put into contact with Harry VE7AIJ in Vancouver, Canada — hope you enjoyed the chat, Kath).

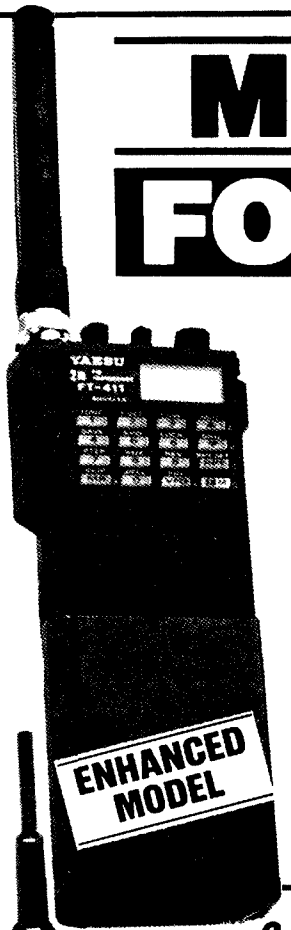
Whilst most of the longer contacts were with other JOTA stations within Australia, the youngsters were soon able to see that communication was quite possible all around the world. Countries contacted included Australia (VKs 1, 2, 3, 4, 6 and 6), New Zealand, South Cook Islands (ATIU), USA, USSR, West Germany, Japan, Canada and Papua New Guinea.

The youngsters were a fairly wide mix of ages and included boys and girls from Cubs, Scouts, Brownies and Guides. Not all got in front of the microphone, but of those who did, two boys stood out in their level of interest in communication and an apparent desire to learn how the radios worked (I wish they wouldn't ask so many difficult questions). I have no doubt that both these boys will be visiting our club in the near future. (Well done Travers and David).

I think everyone involved enjoyed the weekend (I know I did) and those from HARG will certainly have gained satisfaction from the exercise, both as a "radio" exercise and from the aspect of helping our local youth. Some of the Scout group stayed overnight, as did some HARG members (Derek, Lynn, Jon and Gavin). It was a little unfortunate that an ominous-looking storm front saw a rush of activity to dismantle the station at about 1400 (local) on Sunday, but it at least enabled those who had operated all weekend the opportunity for a hot shower and early night.

To those involved from the Scout group — thanks for the opportunity and the hospitality — hope to see you again next year. To those in HARG who participated - thanks. ar

MORE FEATURES FOR YOUR MONEY!



FT-411E 2M HAND-HELD

Superb performance on the 2M band with all of the 'top-of-the-line' features and reliability you know you can expect from Yaesu! Don't be fooled by unknown brands which can only offer some of these features...

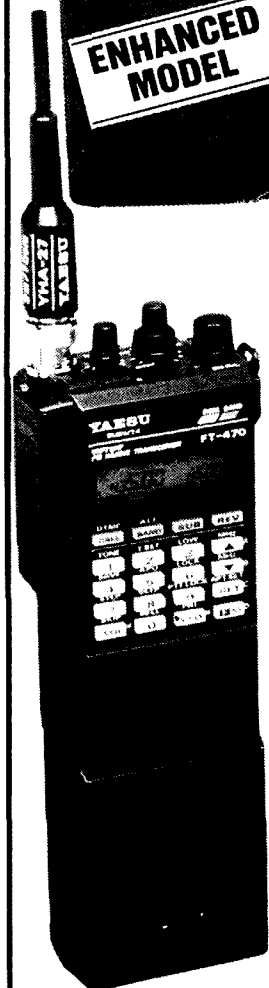
- 144 to 148MHz tranceive operation, with enhanced receiver performance
- Ultra long life 1000mAH NiCd battery pack
- 2.5 watts RF output as standard, up to 5 watts with 12V DC (or FNB-11)
- Better than 0.16uV (12dB SINAD) sensitivity
- Programmable power saver for extended operating periods
- Keypad or dial frequency entry, with 5 selectable tuning rates
- 49 tunable memories which store repeater offsets
- Band, memory, priority, or limited-band scanning
- Carry case, belt clip, approved AC charger
- **2 Year Warranty!**

Cat D-3350

*** Now with enhanced receiver sensitivity and strong signal handling!**

$449

YAESU



2m & 70cm In One!

THE AMAZING FT-470

Hand held performance at its best! The FT-470 represents the pinnacle of high-tech design in compact hand helds providing both 2m and 70cm coverage in one. 2.3 watts on the 2m and 70cm bands with the latest multi-tasking microprocessor control allows a high degree of flexibility. In fact, several functions can be performed simultaneously - including 'dual-band' reception, as well as 'full duplex' operation! That's right, you can be talking through your local 2m repeater and scanning channels for your next 70cm contact at the same time.

There are also 21 tuneable memories and 2 VFO's per band, plus inbuilt C.T.C.S.S. (Tone Squelch, encode/decode) with paging facility, a variety of scanning facilities, LCD display showing 5.5 frequency digits on both bands at the same time, and an LCD bargraph signal/P.O. meter. The programmable 'power saver' system helps maximize battery life, and frequency selection via tuning knob or direct keyboard entry is a standard feature. Comes complete with an ultra long-life 1000mAH NiCad battery pack, carry case, dual band antenna, and an approved AC charger. Why buy 2 hand-helds when you can have everything in one?

Cat D-3360

See A.R.A review Vol 12, Issue 5, or A.R. review Aug '89 issue.

2 YEAR WARRANTY!

Plus Bonus PA-7 Battery Extension lead, valued at $29.95

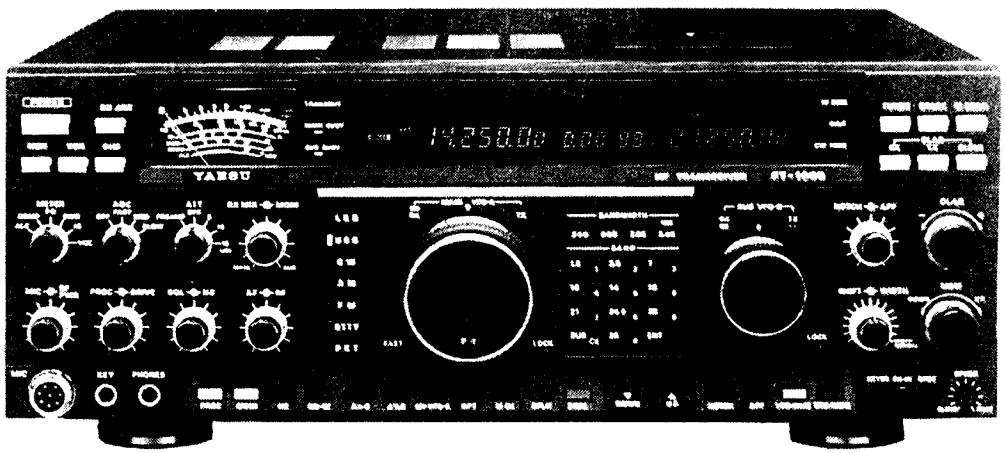
SAVE $100! **$699**

YAESU STOCKS NOT HELD AT ALL STORES. PLEASE CONTACT YOUR LOCAL STORE FOR STOCK AVAILABILITY, OR ORDER BY PHONE...

DICK SMITH ELECTRONICS

B1128/P1

DON'T BELIEVE US?



"The best of the best!"... That's what Yaesu and Dick Smith Electronics think of the FT-1000 deluxe HF all-mode transceiver. But don't believe us- read what the experts have to say...

On documentation
"clearly written and complete, and includes a complete set of schematics and many high quality photos" — QST "The quality of printing and presentation of this book is the best I have seen..." — AR

On operation
"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the icom iC-781 or the Kenwood TS-950S." — ARA "...I found the FT-1000 easier to learn and use than any other radio in its class." — QST

On the receiver
"On receive, the performance was often beyond the limit of the latest professional measuring equipment, with no measurable trace whatsoever of synthesizer phase noise." — PW "...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." — QST* "The direct digital synthesizer works very well and produces receiver performance that sets new standards." — AR "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter — SSB
"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST "Reports were all very favourable, especially when using the speech processor." — AR "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

Transmitter — CW
"CW keying was a delight...power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." — AR "On CW the FT-1000 was absolutely faultless." — ARA "CW operation with the internal keyer is a breeze... in QSk CW operation, the rig has well shaped and weighted keying." — QST

Transmitter — RTTY/Packet
"Using the set on HF packet was an absolute pleasure..." — PW "RTTY and packet radio operation with the '1000 are straight forward..." — QST "Packet and RTTY modes were tried and proved just superb." — ARA

Conclusion
"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW "...the FT-1000 represents unbeatable value..." — AR "it is an excellent set worthy of accolades and rave." — ARA "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST*

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver, and easy to use controls put if far ahead of the competition. Wouldn't you rather be using the "Best of the best"?

Cat D-3200

2 YEAR WARRANTY

$4995

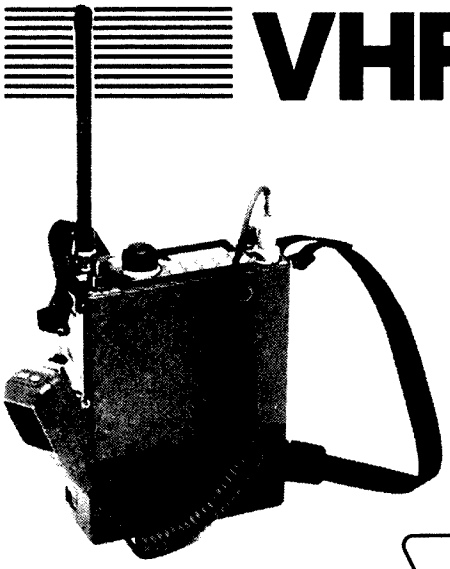
including MD-1 desk mic

Magazines
ARA — Amateur Radio Action Vol. 13, No. 2
AR — Amateur Radio August 1990
PW — Practical Wireless January 1990
QST — ARRL QST March 1991 *(review with optional filters fitted)
Copies of these and other reviews plus our 12 page colour brochure are available upon request. Phone (008) 226610 or (02) 8882105.

DICK SMITH ELECTRONICS

B1128/P2

VHF BARGAINS



2 YEAR WARRANTY!

FT-290RII 2M MULTI-MODE TRANSCEIVER

The all-mode, transportable transceiver for serious field or mobile operations! The FT-290RII features FM, SSB (USB/LSB), and CW operation with 2.5W or 250mW switchable output power, twin VFOs, and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are provided for SSB/CW and FM, while mode specific features such as a noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation make these units very simple to operate. Each unit comes with an FBA-8 battery holder for nine C size standard or NiCad batteries (not supplied), antenna, and handheld microphone.

FT-290RII with flexible rubber antenna covers 144-148MHz.

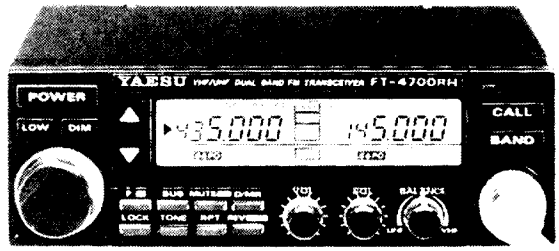
Cat D-2875

SAVE $50 ON 1990 PRICE

$699

2 YEAR WARRANTY!

FT-4700RH DUALBAND MOBILE FM TRANSCEIVER



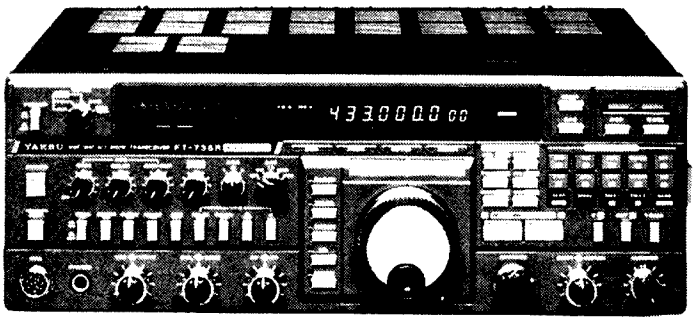
Features 50 watts output on 2 metres, and 40 watts output on 70cm (430-450MHz), with Full-duplex crossband operation or dual-band reception modes provided, so you can listen for calls on both bands simultaneously, or work someone on one band while also listening on the other band. The **BONUS** YSK-4700 extension cable allows the main body of the transciever to be installed remotely, while the front panel mounts conveniently on the dashboard. On the front panel the amber back-lit LCD shows both VHF and UHF frequencies and signal strengths, and all controls are back-lit for clear readability, with a dimmer switch for nightime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands. See ARA review Vol. 12 Issue 11 (Feb 1990), or A.R. review May '89.

Cat D-3300

BONUS • YSK-4700 front panel extension cable
- 2m 5/8 λ mobile antenna
- 70cm co-linear mobile antenna

SAVE $83

$999



OUR BEST EVER PRICE!
SAVE $500 ON 1990 PRICE

2 YEAR WARRANTY!

FT-736R VHF/UHF BASE-STATION TRANSCEIVER

The FT-736R is Yaesu's BEST VHF/UHF transceiver! Designed for the serious VHF/UHF operator, this high-performance transceiver provides 25W output (SSB, CW, FM) on the 2 metre and 70cm (430-450MHz) bands, and can be easily expanded to also cover the 6 metre and 23cm (1240-1300MHz) bands as required. Features include keyboard frequency entry, 115 memories, 2 independant VFO's per band, separate FM Channel knob with selectable channel steps, 2 full duplex VFO's for Satellite operation, IF shift and Notch filters, noise blanker, all-mode VOX, SSB speech processor, GaAs Fet front-ends (430, 1200MHz), high stability TCXO reference oscillator, & an in-built AC power supply. Microphone optional extra.

Cat D-2920

6m module (D-2921) — $299
23cm module (D-2922) — $699 Ltd stocks

LIMITED STOCKS!

$1995

DICK SMITH ELECTRONICS

B1128/P4

FET's as RF Amplifier continued from page 19

built complete receivers. **You can control the gain of a FET without distortion by reducing its supply voltage (to zero if necessary).**

You just need to make a simple AGC amplifier like figure 3 to control the supply voltage of the stages required. Only one is required per receiver. The output controls all stages in parallel.

This is a bit like Plate Modulation as used in the old AM rigs.

The FET in figure 3 is biased more negatively by AGC derived from the amplified signal. The FET is effectively a base resistor for the PNP transistor. As the FET conducts less, the transistor does too, reducing the supply voltage. Note that the transistor carries the supply current for all stages controlled.

Oscillators and mixers, of course, must be fed from a stable power supply and not from the one which is controlled from the AGC voltage.

I hope other experimenters will come up with alternative AGC amplifiers. This one needs to be pruned to suit individual FETs in the AGC amplifier. Op-Amps can do it better and more predictably.

I have published this one to illustrate the principle rather than pursue perfection in this particular circuit.

I started the experiment for this article about 15 years ago, so I felt it was time to share it.

When you can build receivers that work properly, they become lots of fun.

If there is significant interest (ie, letters to the author) I might publish some specific circuits for complete receivers.

Hopefully a few old valve receivers might see DX signals again. **ar**

A Piece of Wire continued from page 20

currents", but be careful: it could be the low angle radiation from the vertical coax sheath that is working your DX!

When shorter than a quarter-wave the Marconi requires series L to resonate it. Variable inductors are hard to come by, but you can over-compensate with a fixed L and then adjust the total reactance to zero with a series capacitor. An old B/C gang is fine, but remember, both sides of this capacitor will be "hot", so use an insulated mounting and shaft. You can now consider what total load resistance you have (radiation + coil + earth_ and adjust it to the value that correctly loads your transmitter with a pi coupler, LC network or RF transformer. Alternatively, you can, by using a quarter-wave + of wire and cutting the length, arrive at a total of 50 ohms + inductive reactance. Then tune out the reactance with a capacitor in series and connect directly to the transmitter. The final length will be affected by the earth resistance, and on how dependent your output stage is on an exact 50 ohm load.

If you have a loading coil/s as part of the aerial, measure or calculate the length of wire used and add it for your total estimate of length in respect to a quarter-wave.

When they called electromagnetic radiation "wireless" it was an inversion of reality! A Wire is essential for radiation. Tailor it for your convenience.

ar

Television in 1932 continued from page 23

ports have been published, and the public has been deceived by the sophistry of the publicity agents. The newspapers are never hesitant about publishing anything scientifically sensational, and give us scraps of information about "infra-red televisors", natural colour television and the like. The principle of the latter is the use of gases in place of neon in the receiver lamp system, which would glow in the three primary colours, but it is doubtful whether such a scheme has ever been tried. A few weeks ago a report was published in an Adelaide paper of some sensational television reception in a train travelling at 70 miles per hour. This is thrilling stuff to read, but more satisfactory television in a radio shack travelling at zero miles per hour.

Occasionally the public gets a glimpse of the truth. In the course of the opening ceremony at the 1931 Radio Exhibition in Adelaide, it was announced that television was not yet with us, and was not likely to make an appearance unless some radically new principle is discovered. In QST for November 1931, in the course of an article rich in metaphors, Ross Hull states, in reference to the statement that television is just around the corner: "Unhappily, many television interests have endeavoured to avoid the corner altogether. But in crossing the vacant lot they have found themselves tangled in the underbrush of unsound principles and faulty methods."

With all this confusion it is not likely that fast progress will be made. It would be a great triumph for amateur radio if groups of enthusiastic experimenters working on new lines would discover something of importance, and lead the commercial interests along the right road to genuine radiovision. It should be remembered that the amateurs taught the commercials how to carry out long-distance communication. There is no doubt that some day we will have real television, but it may be a long way off. Certainly it is a worthwhile field for research by amateurs. **ar**

Amateur Radio in Hungary Today continued from page 24

square kilometres compared with Australia's 7,683,000 square kilometres, and has a population of 10.7 million people. Longest distance from west to east is 500km, and from north to south about 250km.

"Hungary licenses many visiting foreign radio amateurs. Since two years ago, when the scheme started, about 200 to 350 licences have been issued annually to visiting foreign amateurs, especially during summer holiday time.

Most foreign amateur visitors come from Austria, Germany, Holland and the United States.

"If one wants a visitor's licence in Hungary, the following is the procedure: Apply in writing 30 days before the required licence issue date. Supply a certified original licence photocopy, with your personal details and your temporary Hungarian residential address, and you receive a visitor's licence, free of charge, valid for 30 days. Address of the office issuing the visitor's licences is as follows: Frekvencia Gazdalkodasi Intezet (Institute of Frequency Management), Budapest, Ostrom u.16, zip: H-1015, Hungary.

The phone number of the Hungarian Amateur Radio Society (MRASZ) is Budapest 112-1616. There is an answering machine where foreign amateurs can leave messages if they need assistance or information whilst they are visiting in Hungary." So ends the letter of my friend Alex.

Does the situation of the Hungarian Amateur Society sound familiar? Source of funds: membership fees only.

Membership: not compulsory, many amateurs are not members, but are freeloaders who enjoy the benefits and privileges without contributing materially or by volunteer labour to the society. But, to criticise: they are in the forefront. There is a long march ahead, both in HA and in VK. **ar**

AWARDS

PHILL HARDSTAFF VK3JFE – FEDERAL AWARDS MANAGER
PO BOX 300 SOUTHCAULFIELD VIC 3162

Z-Matches, 80 metres and nets?

Last week I finished constructing a Z-match as described by the two Rons in the March 1990 edition of this edition, and strung up a 40m dipole centre fed with 300 Ohm TV ribbon. Well, the Z-match is an amazing device; I tuned on up 80 without too many problems and had some contacts during the John Moyle Field Day and worked all states in an hour or so. With only 30 watts, I was getting 59-plus reports consistently from all over the place.

I am now a confirmed Z-match user (I used to think antenna tuners were only for people who couldn't built resonant antennas). My main aim was to get on 80 without having to put up an antenna that was very obvious as I live in a unit. I solved this by having the apex of the dipole (actually an inverted V) inside the roof and the legs extending out of the tiles near the apex and running down to the ground. The advantage of this is that all of the 300 ohm ribbon is out of the weather and the tuning of the antenna is the same whether it is raining or not.

Now that I am on 80 I hope to participate in some of the awards nets that operate on this band. If you run an award net on 80 (or any other band for that matter), or are aware of one, please drop me a line and let me know. I will publicise all award nets in this column once I have a few on paper. In the meantime, I hope to catch you on 80 soon.

Worked all Continents

It would seem that the information presented in this column in the March edition of *AR* has generated a bit of interest in this and other ARRL awards. Up until last week, I had received only a few applications for Worked all Continents (WAC), but in the past week I have received nine applications for this award. As I stated in that column, you need to be a member of the WIA before you can apply for this award (if you are a VK resident, that is). My compliments to all those who applied, for your neat applications and enclosing SASEs, which makes my job a lot easier, as an application for WAC can be quite time consuming for me to do. I have to make sure that the contacts claimed are in the mode for the requested certificate, check that the country is in fact in the claimed continent, enter all the QSO information onto the application form and double check everything before sending to the ARRL HQ. From this month onwards, I will acknowledge in this column WAC applications that have been processed.

WAC Applications Processed During March (and earlier)

Call	Type	Endorsement	Date Processed
VK4BJE	Phone		28/01/91
VK3IR	Phone		05/01/91
VK4ZJB	Phone	50MHz	28/01/91
VK4FV	Phone		24/03/91
VK5HP	CW		24/03/91
VK2GAH	Phone		24/03/91
VK3KTO	Phone		24/03/91
VK3ETM	Phone		24/03/91
VK6PY	CW		24/03/91
VK6PY	Phone		24/03/91
VK2EHF	Phone		24/03/91
VK2PIF	Phone		24/03/91

In the past it has been my belief that WAC awards would be mailed directly to the person claiming the award. However, I have just received from the IARU secretariat three certificates in one mailer addressed to me for me to mail out. I don't know if this will be standard practice from now on, as I just sent these nine off together as well.

WAVKCA

You may be asked by a DX contact some time or another what is happening with an application that they put in for WAVKCA. At the moment, for a number of reasons, I am a little behind with processing applications for WAVKCA.

The main two reasons being that I have spent a lot of time in the past two months trying to write a program to manage the DXCC side of things. This has almost come together, but I still have a lot to do. Once this is done, though, I will be able to have regular listings of updates, as these will take no longer than a few minutes to produce. The hardest part will be entering all the information. In this department I have had an offer from Peter Styles VK3EBP to key in all the data, and Bill Verral VK5WV sent me a copy of his DXCC program written in dBase III+, which I have used portions of in my own program. Of course, while all this is going on, Steve VK3OT has been looking after all the DXCC updates etc. So, as you can see, it is very much a team effort.

Now, to get back to WAVKCA, the other reason I am a little behind is that we ran out of certificates in January, and I had been shopping around for a good deal on printing new ones. As it turned out, we are going ahead with getting them printed by our usual printer. I had someone who was going to do them cheaper, but he kept putting me on hold, and I was getting too far behind. These certificates are expensive to print, because of the number of colours in them and their size. We made the decision to reduce the size a little (down to about 90 per cent of the original size with no blank border) and to print on normal paper rather than on the on the rather heavy paper they were on before. All of this will keep the cost down sufficiently so as to enable us to keep the colour. Although the certificate in its present form may look a little dated, it never fails to get the most compliments and continues to impress those who receive it. Because of this I decided not to change the design at all.

The DXCC Procedure

Due to the fact that I received a couple of nasty letters regarding the amount of time taken to process DXCC updates and new applications, I have instituted new procedures for DXCC. I should firstly point out that the delay was due to myself and nothing to do with Steve VK3OT (DXCC assistant). The following has been sent to all people waiting on updates etc.

"Thank you for your interest in the WIA DXCC program. Your application for update/DXCC has been received by myself and forwarded on to the DXCC assistant. I would like to take this opportunity to explain the new procedure for the handling of updates and new DXCC applications.

All DXCC mail is forwarded to myself (Federal Awards Manager) and all applications for DXCC and updates are recorded and then passed onto the DXCC assistant.

At this stage you will receive an acknowledgment from me that your correspondence has been received and is being acted on. Any QSL cards that you have sent are checked by myself and returned the same day they are received. This is to avoid unnecessary delays and to get your cards back to you as soon as possible.

Applications for new DXCC will be issued by myself and will take a little longer as I have to get the approval back from the DXCC assistant. Updates will be issued directly from the DXCC assistant.

I believe these new procedures will help speed things up a bit as well as putting your mind at rest. I have been very busy lately, trying to finish a program I am writing to computerise DXCC, and this will become reality within 6-8 months. When this is done, updates will be listed regularly in *AR* and new DXCCs will be easier to process.

Your understanding would be appreciated, and if you have suffered a delay in the past I assure you it will not happen again.

Awards Requiring Contacts in 1991

From Ted Melinosky (K1BV) who publishes the K1BV awards directory (see last month's column) comes information on awards that require contacts during 1991.

Estonia — Paide 700 Years Award — Contact ES3 stations from 1 Jan 1991 to 1 Jan 1995. Europeans need 10, others five. One contact per station per band. All modes. One QSO with ES3XV is required. GCR list and fee of six IRC or $US3 to: Yeryomin M Yuri,

PO Box 81, Paide, 202820 Estonia, USSR.

Indonesia — Visit Indonesia Year Award. Work/hear three of the special event stations which are celebrating Visit Indonesia Year 1991 with their 8A6 prefix. Stations planned to be active during the year: 8A6INA, 8A6NIN, 8A6VST, 8A6YER. GCR list, your own QSL SAGON and fee of four IRCs to: Awards Manager, PO Box 666, Medan 20001, Indonesia.

Spain — Barcelona Olympic Games Award. Contact EA3/EC3 stations during the period 1 September 1990 to the last day of the Olympics, 9 August 1992. All modes and bands. One award per station. Valid QSLs will be marked "Olimpiada Cultural Barcelona 92" and are worth 1 point each. Spain, Balearic, Portugal and Andorra need 70 points; Europe, Africa, Canary Islands and Azores Islands need 50 points; Asia, North and South America need 30 points; Australia/Oceania needs 10 points. Stations will use: CQ CQ Barcelona 92. Send in the numbered label of the QSL card, including their call with the serial number as listed. Award is FREE. Apply to: Radio Club Baix Penedes, Box 250-43700 El Vendrell, Tarragona, Spain. (CQ Mag)

USSR — Russian Matrioshka 100 Years Award. During the period 1 January 1990 to 31 December 1991, work at least 100 different USSR stations. Stations may be contacted only once on any band and any mode. SWL OK. GCR list and fee of 10 IRC or $US5 to: Awards Manager, PO Box 6, Makoevka, 339000 Ukraine, USSR. (TKS UA9CGL)

USSR — Town of Voizhsk 50 Years. Earn 50 points by working Voizhsk stations during the period 1 January 1989 to 31 December 1991. Each QSO with a Volzhsk station equals four points, SWL cards from this town equals one point. Note: Foreign stations need only five QSOs. Special activity week during last week in May. Apply with GCR list and fee of five IRCs to: Radioclub, Box 5, Volzhsk, Mariyskaya ASSR, 425008 USSR.

Look for UZ4SWF SWQ SWU SWV UW4SA RA4SAE SBV SAP SA1 SAZ SBJ UA4SAB SAC SAI SCG SBA SBP SGA SGE SGG SGS SDR SDG SSB SBY SDL SGI. ar

CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CO-ORDINATORS)

Contest Calendar

May	
4-5	ARI International DX (Italian)
11-12	CQ-M DX (USSR)
25-26	CQ WW WPX CW
June	
15-16	All Asian DX Phone (JARL)
22-23	VK novice (date to be confirmed)
July	
20	Sunshine State Jack Files Memorial Contact (Rules *AR* June)
Aug	
24-25	All Asia DX CW (JARL)
17-18	RD Contest
Sept	
14-15	33rd Scandinavian (CW)
2-22	33rd Scandinavian Phone
Oct	
5-6	VK-ZL Oceania DX SSB
12-13	VK-ZL Oceania DX CW
26-27	CQ WW DX SSB
Nov	
23-24	CQ WW DX CW

The Sunshine State Jack Files Memorial Contest 1991

Objects

1. The objects of the contest are to:
   (a) perpetuate the memory of the late Jack Files, a longtime member of the Council of the Queensland Division of the Wireless Institute of Australia;
   (b) enable amateur radio operators to work Queensland stations for the Worked All Queensland Award, and other awards issued by radio clubs in Queensland;
   (c) encourage mobile/portable operation from the lesser populated towns and shires in Queensland;
   (d) provide a "warm-up run" for the Remembrance Day Contest

Period

2. The contest will be run in one time period, on Saturday 20 July 1991. The period will encompass **any six consecutive hours** between 0200 hrs UTC (1200 hours EAST), and 1359 hrs UTC (2350 hrs EAST), or part thereof, ie, six hours is the maximum operating period.

Sections

3. Stations within VK4:
   (a) Tx all band. Twenty per cent of contacts claimed must have been made on the V/UHF bands;
   (b) Tx HF phone;
   (c) Tx HF CW;
   (d) Tx V/UHF only;
   (e) Club stations in (a) to (d) above, single transmitter.
4. Stations outside VK4:
   (a) Tx all band phone;
   (b) Tx all band CW.

Preferred Contest Frequencies

Phone	CW
1.820-1.840 MHz	1.805-1.815 MHz
3.570-3.590 MHz	3.525-3.535 MHz
7.100-7.120 MHz	7.010-7.020 MHz
14.180-14.200 MHz	14.050-14.060 MHz
21.170-21.195 MHz	21.125-21.150 MHz
28.480-28.520 MHz	28.125-28.150 MHz

Operation

5. The WARC bands may not be used in this contest. Crossband operation is permitted only via a satellite repeater; contacts made via a net are not admissible; cross-mode operation is allowed.
6. The contest is primarily for single-operator stations, but log-keepers are allowed. Where two licensees use a single station, each is to submit a separate log.
7. Club stations may use multiple operators, provided there is only one transmitter in use at any one time.
8. Home-based stations may be worked again after an elapsed time of one (1) hour.
9. Mobile or portable stations are not subject to the one-hour rule when operating from a different city/town/shire. When operating within one hour from that of previous operations, they are regarded as "new" stations for their own and the contacted station's scoring purposes. (Different is not to be taken as alternating, eg operations from area A for 50 minutes, then move area B, operate for 50 minutes and return to area A, would be regarded as alternating, not different). Operations from the same city/town/shire after one hour, regardless of movement within that area, are regarded as home station operations.

Calling Procedure

10. Phone: CQ Jack Files Contest
    CW: CQ Test Jack Files

Exchanges

11. Each exchange is to contain the following elements:
    (a) the location designator, N or S, see **scoring;**
    (b) the serial number beginning with 001 and continuing in sequence throughout the contest and on all bands worked;
    (c) the "code letters" of the designated city/town/shire as set out in the attached "designated areas and code letters".

Scoring

12. For scoring purposes, Queensland is divided into two zones by the Tropic of Capricorn. Stations in designated areas north of the Tropic are to use the letter "N" as the first element of contact exchange. Those in designated areas south of the Tropic are to use "S" similarly.

Example: A valid exchange for scoring purposes might be:

S	001	MH
Zone	Contact	City/town/shire
N	132	RH

13. Stations within VK4, phone contacts:
    (a) HF/V/U/HF within the same zone 3 points
    (b) HF/V/U/HF with the opposite zone 5 points
    (c) HF/V/U/HF outside VK4 2 points
    (d) All CW contacts score double points, ie 6, 10 or 4.

14. Stations outside VK4, **all** phone contacts, two points, **All CW** contacts, four points.

Bonus Points Applicable to all Stations

15. A bonus of ten (10) points may be claimed for the first contact with a city/town/shire, other than the one from which the claimant is operating, over the whole contest.
16. A further bonus of ten (10) points may be claimed for each club station on each occasion it is worked (one-hour rule still applies).

    Examples: Phone. A VK4 station in S zone, first contact with VK4OOO in Cairns, which is the club station of the Green Island ARC Inc ... score five points for across zone, 10 points for first contact Cairns City, 10 points for club station, total 25 points.

    CW. For the same contact, score 10, 10, 10, total 30 points.

    Stations outside VK4 would score 2, 10, 10, or 4, 10, 10, for phone or CW respectively.

    NB. No further bonus may be claimed for Cairns City.

Logs

17. Logs must show the full name, address and callsign of the operator(s), the section entered, points claimed for each contact and the total points claimed, a signed and dated statement that the rules have been followed, and the appropriate licence conditions observed. A recommended form of log is:

18. Logs are to arrive at:
    VK4 Contest Manager
    T Mulholland VK4AEM
    PO Box 35
    Caloundra City 4551

On or before 16 August 1991.

Awards

19. Trophies will be awarded by the VK4 Awards Manager to the highest scorer in each section, provided that there is a minimum of five entries in that section.

Code to Define Cities, Towns and Shires for the Jack Files Contest

Cities/Towns

Brisbane	BN	Warwick	WA
Bundaberg	BU	**Shires**	
Cairns	CS	Albert	AL
Caloundra	CA	Allora	AA
Charters Towers	CT	Aramac	AC
Dalby	DY	Arakun*	AN
Gladstone	GD	Atherton	AT
Gold Coast	GC	Burdekin	BK
Goondiwindi	GI	Balonne	BL
Gympie	GY	Banana	BA
Hervey Bay	HB	Barcaldine	BC
Ipswich	IP	Barcoo	BO
Logan City	LC	Bauhinnia	BH
Mackay	MC	Beaudesert	BT
Maryborough	MB	Belyando	BY
Mount Isa	MI	Bendemere	BD
Redcliff	RC	Biggenden	BG
Rockhampton	RH	Blackall	BX
Roma	RM	Boonah	BV
Toowoomba	TO	Booringah	BQ
Townsville	TV	Boulia	BZ
Thuringowa	TH	Bowen	BW
Broadsound	BS	Mareeba	MA
Bulloo	BP	Maroochy	MO
Bungil	BI	Milmeran	ML
Burke	BR	Mirani	MN
Caboolture	CB	Miriam Vale	MV
Calliope	CL	Monto	MT
Cambooya	CM	Moreton	MR
Cardwell	CD	Mornington*	MZ
Carpentaria	CP	Mount Morgan	MM
Chinchilla	CH	Mulgrave	MG
Clifton	CF	Mundubbera	MU
Cloncurry	CY	Murgon	MY
Cook	CK	Murella	MX
Crows Nest	CN	Murweh	MH
Croydon	CR	Nanango	NN
Dalrymple	DL	Nebo	NE
Diamantina	DI	Noosa	NO
Douglas	DG	Paroo	PO
Duaringa	DU	Peak Downs	PD
Eacham	EA	Perry	PY
Eidsvold	ED	Pine Rivers	PR
Emerald	EM	Pioneer	PI
Esk	EK	Pittsowrth	PT
Etheridge	ET	Proserpine	PP
Fitzroy	FZ	Quilpie	QL
Flinders	FL	Redland	RD
Gatton	GT	Richmond	RI
Gayndah	GH	Rosalie	RO
Glengallan	GL	Rosenthal	RL
Gooboorum	GM	Sarina	SA
Herberton	HT	Stanthorpe	ST
Hinchinbrook	HK	Tambo	TB
Ilfracombe	IL	Tara	TA
Inglewood	IW	Taroom	TM
Isis	IS	Tiaro	TI
Isisford	IF	Torres	TE
Jericho	JE	Waggamba	WG
Johnstone	JO	Wambo	WO
Jondaryan	JY	Warroo	WR
Kilcoy	KY	Widgee	WE
Kilkivan	KK	Winton	WI
Kingaroy	KG	Wondai	WD
Kolan	KO	Woocoo	WC
Laidley	LA	Woongarra	WN
Livingston	LV		
Longreach	LO		
McKinlay	MK		

*Permission to operate in these shires is required. **ar**

Date / Time	Band	Mode	Call	No Sent	No Rec'd	Points QSO	C/T/S	Club	Total
15 7 89									
0834	7.0MHz	Phone	VK4OOO	SOO1BE	NOO2CS	5	10	10	25
0837	7.0MHZ	Phone	VK4SSS	SOO2BE	SOO1BE	3			3
(Assumes VK4SSS is not a club station)									

HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

I read somewhere that when the mountaineer was asked why he wanted to climb the Himalayas, his short reply was: "Because it is there!"

Maybe we DXers are in the same mould. It is a challenge. We try to climb the mountain of ever-changing DX countries to reach the present magical number of 322.

There are givers and takers in this challenging game. It is a challenge to the givers to activate a rare DX country, sometimes at their own personal physical peril, discomfort, illness and financial stress.

It is also a challenge to the takers, who go into the battle of "pile-ups" with their basic tribanders and 100 watts, day by day, night by night, to emerge sometime later with bleary eyes, shaky hands, and announce to a sympathetic, slightly puzzled partner: I worked S2! The signals were 5x9!

Bangladesh S2 — Bhutan A5

Jim VK9NS has been negotiating with the Bangladesh authorities for more than a year to go there for a DXpedition. Bangladesh has not been officially on the bands since 1981, except for a short activation last year by a Japanese group. The country is high on the list of most-wanted countries. According to the *DX* magazine, 62 per cent of its readership wants Bangladesh as a new country.

Political turmoil has interfered several times with Jim's plans. Every time the authorities were ready to give him permission to enter and grant him a licence, there was a change of government, and the whole process had to be started again. Since early February Jim was ready to go. The green light finally came on 20 March and Jim has left. Hopefully, by the time you read this, the operation would have been a success, and you would have worked him, and you can strike off S2 from your own personal list of wanted countries. At the time of writing, it is not known whether Jim was given a licence or not. However, he is in the country at the invitation of the Bangladeshi authorities.

Following Bangladesh, Jim will have a short rest. Then he will pack his bags again and leave with his wife, Kirsti VK9NL, for Thimphu, Bhutan A5, where he will arrive in the first week of May with a beam antenna and amplifier. This is the second time he has

visited this Himalayan country. Hopefully those who missed out the first time will be able to work Bhutan on this occasion. QSLs in separate envelopes with return postage go to: Jim Smith, PO Box 90, Norfolk Island 2899, South Pacific.

Norfolk Island — VK9

On 9 April, the Norfolk Island Philatelic Bureau, Norfolk Island, 2899, South Pacific, issued three stamps to the values of 43¢, $1.00 and $1.20, commemorating amateur radio. The three stamps show Norfolk Island and its global and regional location, and lists the callsigns of Norfolk's five current residential amateurs: VK9JA, VK9ND, VK9NI, VK9NL, VK9NS. Send your order for the first-day cover with your local Australian cheque for $2.85 to the above address.

Auckland and Campbell Islands — ZL9

A group of ZL and JA amateurs made a short visit to these southern islands at the beginning of March. These islands count as a separate DXCC country. The callsigns used were: ZL9DX, ZL9TPY and ZL9YL. ZL9YL was used by the lady operator forming part of the group. All QSLs go to: JH4RHF Tanaka Junichi, 1-4-6 Katobaki, Hattori, Toyanaka, Osaka 561, Japan. SAE and one green stamp, please.

Andorra — C30

A group of Swiss amateurs will be active from Andorra between 10 and 20 May, on the usual DX frequencies. Look for them on: 28495, 21295, 14195, 7085, 3795, and/or on: 28025, 21025, 14025, 7005 and 3550. QSL goes to HB9MM, the USKA Swiss Radio Club, Section Vaudois, Box 3705, CH-1002, Lausanne, Switzerland.

DX QSLing

My attention was drawn by a number of VK4 DXers to a list with the heading, "The following are countries without a QSL Bureau. There is no point in sending your QSLs to the VK4 Bureau for on forwarding to these countries. Please QSL direct." This list appeared in the VK4 WIA monthly publication, *QTC*, February 1991 issue.

After having cross-referenced both the International and the North American callbooks (1991 editions), I must come to the conclusion that the quoted list is substantially correct. Here, now, are the callsigns for which there are no QSL bureaux according to the "Callbook". Therefore, your cards cannot be forwarded directly through your own bureau.

A5, A7, C9, D2, D6, FH, FR, FW, HZ, H5, J5, KH1, KH3, KH5, KH5K, KH7, OH0, OJ0, PY0, S9, S0, TJ, TL, TP, TT, T30, T31, T32, T33, T5, VR6, VP2E, V3, V4, V5, V6, V8, XF4, XU, XV, XW, XZ, YA, ZA, ZD7, ZD8, ZD9, XK3, ZL0, 1A0, IS, 3C, 2D2 Rotuma, 3V, 3W, 3Y, 4U1U, 3X, 4J, 5H, 5U, 5X, 7O, 7Z, 8Q, 9G, 9N, 9Q, 9U.

However, there is no guarantee that all the bureaux with addresses in the callbook are functioning. I cannot imagine, for example, that the ET bureau is working, despite the address shown in the callbook. The above list is not complete or infallible. Your comments will be appreciated. But a word of hope — all is not lost. Very often cards with prefixes from the above list can be handled c/- QSL managers via the Bureau. I never had any difficulty sending or getting a card from OH0 via the Bureau, but I always marked the QSL route on the card, both front and back. If there is no QSL route (QSL manager) shown on your card to an exotic prefix country, your bureau manager has a problem and your card is in trouble. Looking at the extensive list of DX prefixes with no bureau facilities, I want to remind all DXers to mark the QSL route. If there is a manager, send the card directly to the manager, or find out from your DX QSO partner, if there is time, whether the manager accepts cards via the bureau. (Some do, but most of them don't). Please listen in the pile-up patiently for the QSL information. If the instruction says: callbook address, send your card to that address direct. It is quite astonishing to discover that for the Colvins' Australian activity, in February 1990, with the non-exotic ordinary callsign of VK2GDD, more than 500 cards have arrived at the VK2 Bureau doorsteps, some even from the USA. The Colvins' QSL address is well known, is well published, is given out several times on each appearance (c/- Yasma in California, USA). About DX QSLing, see also my notes in March and May 1990 issues of *AR*.

Some of you will know that I have completed an extensive report on VK QSL Bureaux with certain recommendations in 1990, as requested by the federal body of the WIA. Here are now *some challenging questions to all VK outgoing-bureau managers!*

Please write me a short note and tell me:

a) What do you do with the cards sent to you by the members who do not know any better, for which there is no QSL bureau on the other end?
b) Do you return them to the sender?
c) Do you destroy them?
d) Do you give a list to the bureau members before they join up, or when they join up, about the prefixes where you are unable to forward the cards?
e) Do you tell them to put QSL routes (QSL managers) callsigns on both sides of the cards?
f) What other measures do you undertake to facilitate the forwarding of these cards to those prefixes?

These are serious questions. I am waiting now to receive your replies. Readers: please stay tuned, I will publish the replies.

Bing — VK2BCH and the South Pacific

I received a letter from "Bing" which throws an interesting light on this particular DXer who likes to do his DXpeditions in his own way and alone. Bing spent most of his life in the British and Australian Armies and, after changing "jobs", had a seven-year period as a "school sergeant major" at a well-known North Sydney private school. In 1980, he retired to Forster, NSW, a holiday spot on the east coast. He has a radio amateur background of 40 years in radio clubs in England, Palestine, Egypt, Cyprus and Malaya. He joined the WIA in 1976 and, after a brief spell as a novice, he obtained his full call in 1983.

He started travelling as a DXer in 1983. He went to Lord Howe Island as VK9LB, to South Cooks as ZK1XV, to Tokelau Islands as ZK3RVC, to Western Samoa as 5W1GY, to Tonga as A35XV, and to Fiji as 3D2XV. Lately his favourite spot is Rotuma Island as 3D2XV, where he will probably return in April this year. Bing ends his letter thus: "I use only voice on radio. I hate CW. During World War II, I fought Rommel in the desert and in Italy. I was wounded twice in action. After eight months in hospital, I ended up on D-Day in France. At times I was up to 15 hours on CW, sitting in a very noisy tank. Never again!"

We wish you good health and plenty more DXing, Bing!

Interesting QSOs and QSL Information

Note: callsign, name, frequency, mode, UTC, month of QSO.

A92FL - 21026 - CW - 2030 - March. QSL to WD4DCY Hubert W Buck Snr, Rte 1, Box 290A, New Bern, NC, 28560, USA.

VQ9TB - 21008 - CW - 0700 - March. QSL to the Manager, Box 55, PO, San Francisco, 96685, USA.

5B4FB - Gorios - 14019 - CW - 2033 - Feb. QSL to Gregorios Papadopoulus, 25A Byzantiou, Nicosia, Cyprus.

GJ0KYZ - Paul - 14004 - CW - 2022 - Feb. QSL via Bureau.

TA2AO - Osman - 14037 - CW - 2006 - Feb. QSL via Bureau.

9M8AX - Ross - 21MHz - 0951 - Jan. QSL to 9M2AX via the Bureau.

T23XX - Claus - 14MHz - 1022 - Jan. QSL to DL2GBT via the Bureau.

JW0GB - Laila (yl) - 14226 - SSB - 1120 - Feb. QSL to WB4ZBI Howard K Moll Jr, 8174 Coventry Ln, Chattanooga TN 37421, USA.

TA8C - 1422 - SSB - 0639. QSL to the Manager, PO Box 13, Gaziantep, Turkey.

VK9LM - Rudi - 10102 - CW - 1035 - Feb. QSL to DJ5CQ Rudolf Mueller, Alter Main 23, D8601, Ebing, Bamberg, Germany.

XF0C - Juan - 14222 - SSB - 0647 - March. QSL to XE1BEF Hector Espinose Flores, PO Box 231, Colima, 28000, Mexico.

T31AF - Karl - 14027 - CW - 0625 - March. QSL via Bureau to Manager DL2MDZ Rainer Kuehnberger, Friedrich Str, 10, D8662, Helmbrechts, Germany.

VR6MW - Meralda - 14335 - SSB - 0809 -

March. QSL to NZ9E David F Miller, 7462 Lawler Ave, Niles, II, 60648, USA.

CP50RCB - Vic - 14226 - SSB - 1138 - March. QSL to the Manager, PO Box 800, Cochabamba, Bolivia.

RTTY News

Syd VK2SG has returned from his holidays in VK5. Here is the list of some of the interesting contacts.

7Q7LA - 14083 - 1755Z - QSL to G0IAS • 5V7DP - 28098 - 1129Z - QSL to KA1DE • A92FG - 14089 - 2138Z - QSL to ARAB, Box 23381, Muharrak, Bahrain • TY1PS - 21080 - 0039Z - QSL to BP06-2535, Cotonou, Benin, North Africa • 9J2BO - 28085 - 1006Z - QSL to W6ORD • 3B9FR - 28087 - 1015Z - QSL to Box 31 Rodrigues Island, via Mauritius • KG4CO - 21083Z - QSL to APO 09593, New York, USA • VP5VDV - 14088 - 0453Z - QSL to WD4JNS.

Incidentally, Syd just passed the mark of 260 countries confirmed on RRTY, which puts him in No 1 RTTY position in Australia.

From Here and There and Everywhere

Murphy's typo error raised its ugly head again. The next WARC will be in the year of 1992, and not 70 years earlier as it appears in the first paragraph of this column in the March issue of *AR*.

Additional info on "Maritime Mobile" *AR* March 1991. Arthur VK6ART (the former controller of the Traveller's Net), Ron ZL4MK and Arthur VK2AS, were the other group of VK amateurs who actively assisted both the Hungarian yachties and the BOC fleet while they were sailing in the area from Perth (VK6) to Cape Horn (CE8). For two and a half months it was a daily sked at an appointed hour.

Ken VK5QW advises that Al/Mohamed 9K2CS is active and well. I heard him and 9K2SH on 20m a few days after the liberation of Kuwait. All the DXCC cards of 9K2CS were destroyed during the short Gulf War. It is suggested that anyone who ever worked Al as 9K2CS might like to mail him a card for their previous QSO,and thus replace the cards which were lost.

The logs for 701AA were not lost, and now are in the hands of Gaby DL2BCH who has undertaken the huge task of QSLing to those who did not get a card before the Gulf War started. You have to submit a new card, and the usual self-addressed reply envelope. Please note that due to the new exchange rate between DL and W currency, one green stamp does not cover the airmail postage from Germany. Suggest you send two green stamps or two IRCs.

Picture QSL cards of 708AA have started to arrive in VK from QSL manager F6EXV.

The QSL cards for the various Pacific operations of Kiyoko should be sent direct only to the address shown in March 1991 *AR*. Kiyoko does not have a Japanese callsign, and she is not a member of the JA QSL Bureau.

Austin VK5WO reports that the Sts Peter and Paul Rock operation of the Natal DX group PY0S is still on target, possibly in the first week of May for 10 days.

Plastic everywhere! According to the DX news sheet, it is quite in order to quote your international credit card number when you apply to the ARRL for your DXCC award.

The cards of CE0ZZZ are currently being mailed by the manager CE3BFZ.

Martin VP8CEO is now back in the UK and is working his way through the 3000+ QSL cards, as is KL7W/W6 Dick, who was acting as his QSL manager for the last few weeks of his contacts. Martin is asking everybody who sent cards to him, but not yet received a reply, to be patient.

Jack ET2A, not heard from Ethiopia for eight years, appeared on a variety of frequencies during March. On 20m, only a few VKs were able to work him due to weak signal and bad propagation. However, on 21 March he had quite a good signal on 15m on short path to VK. The news is that, at the end of March, Jack goes back to USA for one month, but will be back in Ethiopia in May with a linear amplifier. See also April 1991 *AR*. Please note: the QSL manager's address given in that issue of *AR* is, unfortunately, no longer correct. Peter WB2WOW became a silent key just a week before Easter. The new QSL manager for ET2A, ST0DX and 7Z1AB is WA2NHA Howard Messing, 90 Nellis Drive, Wayne, New Jersey, 07470, USA. My understanding is that there is no need to re-QSL if your card was already on its way to Peter.

On 27 April the International Marconi Day was celebrated from quite a number of those locations which had some significance in the first radio experiments of Marconi. The UK was represented by five stations; Italy with three stations; Canada had two; the USA, Ireland and South Africa were represented by one station. All these stations had an MD IMD MDI combination of suffixes. Australia, despite pioneering some work with first transmissions from the UK, it appears, was not represented.

The Cocos-Keeling Island expedition of Peter VK3AWY was moved forward from May to March or the beginning of April. The callsign is VK9YJ.

There is quite a lot of uncertainty about the activity of a station using the callsign 4K1ZI and allegedly active from the South Sandwich Islands. Official Moscow sources know nothing about him, neither does the UK Foreign Office. The RSGB DX news sheet does not think it is a legitimate operation. Is it a pirate? Some think so, despite the fact that QSL info was given as RB4JBU, which callsign is rumoured to be not a valid one.

TW3M will be active from Molene Island (EU-65) from 4-12 May. QSL to FE1JGG.

JA5FHB is a member of the Japanese Parliament and has just been appointed as Minister for Transport and Communication in that country.

The QSL manager for Festus 9M8FH and for Loretta FM8LL, his wife, is N5FTR.

Eva PY2PE advised, on the air, that 7X5ST/3V8 is back in Algeria, but will be back in 3V8 land after mid-April, with a better antenna and a 100w transmitter.

QSLs Received

Note: W=week; M=months; Yrs=years; FM=from, MGR=manager, OP=operator.

Direct cards: V63AD (12M FM OP on his return to USA); FO0IGG (111M FM MGR),; KG4CL (10M FM MGR); T32B (10M FM MGR);JE4LWQ/JD1 (8M FM MGR); YJ0AMD (4M FM OP); V63JC (3M FM OP); T33WV (3M FM MGR); OX3SG (9M FM MGR);708AA (6M FM MGR); CE0ZZZ (15M FM MGR); 5R8GN (2M FM OP); VP8CEO (9W FM OP); VP8CEG (4M FM OP).

Thank You

This column is the result of a joint effort of many DX friends. Have you contributed to it? Many thanks for the help received from the following: VK2BCH, VK2DID, VK2QL, VK2SG, VK3DBZ, VK3DD, VK4DA, VK4CRR, VK4OH, VK5QW, VK5TL, VK5WO, VK9NS, VP8CEO, QRZ DX, *The DX Bulletin and DX News Sheet.*

If you are writing to me for individual QSL

Bing VK2BCH on ANZAC Day in his home at Forster.

addresses, please enclose a self-addressed and stamped envelope to reduce costs. Keep the information coming in.

Late News — Bangladesh

I just received the news that Jim VK9NS will be active from Bangladesh, probably just before Easter. He has to use the callsign S21U, which is the official callsign of the National Broadcasting Authority in Bangladesh. He can operate only on the following allocated frequencies: 14155, 21255, 28455, SSB, and CW on 14020, 21020, 28020. He is not allowed to use a keyer, but only a straight key. All his transmissions will be monitored by the authorities. Jim will stay in Bangladesh until 5 April. RTTY operation is not permitted.

Stop Press

The latest news again changed the above situation. Jim arrived in Bangladesh on 22 March. It took him some time to find his way out from the bureaucratic maze. After obtaining his licence, and several signatures later, he still needed the final signature of an important person before he could transmit. He came on air finally on 3 April, 12 days after his arrival in the country, and this left him only three days of operation. He was active mostly on 21255kHz, with a vertical antenna and low power. Besides a limited number of VKs and ZLs, most contacts were made with Japan and the US. His QSL address has changed — for this Bangladesh operation only — to JA1UT, Yoshi-O Hayashi, 4-20-2, Nishi-Gotanda Shinagawa, Tokyo, Japan. Better luck next time, Jim.

GOOD DX AND 73. ar

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169 MENINGIE 5264

Six Metres

During the past month or so 50MHz has been very rewarding for those prepared to put in the time and effort to latch on to many exotic signals which have appeared. During the four months when I was laid up, so much happened it seems a pity the best of it has not been recorded in print for future reference. Therefore, I have removed the beacon list for this month to make room for extracts from the logs of some prominent operators.

Col VK5RO reports a number of openings to the USA including one well into the USA to WA85SG 449 both ways on 19/3. Col also worked NH6LT/KH6 who was running one watt on 27/3 at 0047 with signals 559! On 28/3 at 2322 V73AT and heard PJ9JT. At 0402 on 29/3 KG6UH/DU1 was worked. His QSL address is Captain Louis Anciaux, USNR, USCINCPACREP-LND, US Embassy, Manila, APO San Francisco, California, USA, 76528. Phew!

On 12/3 Col called LA9HLZ and, although a reply was received, no contact was made. Col also reports the Italian stations operate between 50.150 and 50.160 and use 50.153 as a calling frequency.

The VK5LP establishment was able to finally get back on the air after a long absence starting with 3D2PO on 9/3. JAs have been frequent visitors with a very good opening on 27/3. On 28/3 A35EM (home call JA1OEM) in Tonga was worked at 2243, followed by 3D2ER at 2303. 29/3 produced 3D2CM, and on 30/3 V73AT in the Marshall Islands at 1148.

Log Extracts

Ron VK4BRG says he has been forced to rethink his views of the ZL path as he has worked many ZL3 and ZL4 stations recently, something which has been rare in the past. His log shows 5/2/91: 2347 6W1QC Senegal and later worked by VK4ALM. 6/2: 0127 6W1QC, 0958 NI6E/KH6, 1001 WA6EMV/KH6, 1104 T20AA. 12/2: 0134 FK8FU, FK8EB, 0625 NI6E/KH6, 0631 KH6IAA, 1042 F1FHI. 14/2: 0400 JAs, 0614 NI6E/KH6, KH6IAA, 0915 PA0HIP, 0919 PA3EUI, 0922 DL0TD, DL2ZBN, DK5UG. (A side comment from Ron was that Lyn VK4ALM had the European propagation prior to him and worked about double the number of PAs and DLs plus two F stations). 17/2: 0133 to 0219 9L1US beacon. (Side comment — PY5CC worked two VS6s and 130 JAs!) 18/2: 0132 6W1QC, 0250 9L1US beacon S9. 21/2: 0648 KH6IAA. 23/2: 0112 6W1QC who said he was leaving 6W on 28/3. 24/2: 006 to 0129 — 31 W stations covering the areas of California, Arizona, Texas, New Mexico, Alabama, Georgia. Indications were that the eastern states stations were worked by Es extension. 0135 621QC worked six Brisbane stations.

Ron included a list of his countries worked and also mentioned that on many occasions foreign video was received, alerting him to possible openings to certain areas. Thanks for writing, Ron.

Steve VK3OT has sent log extracts, and his European contacts make interesting reading, especially those on 8/2/91. Most were made on CW, and from the times quoted you can see he did not waste time between contacts! Those marked * are new countries for him.

5/2: 1022 SM6CKU*, 1023 OH2TI, LA9ZU*, 1024 F2AIA, 1025 DL9CA, 1042 OH2TI, 1045 OZ7DX*, 1050 JA5CMO, 1054 SM6CKU, 1104 OH2TI, 1106 SM6DER, 1120 G3HBR. 6/2: 0155 ZL3TY, 0200 ZL3TIC. 7/2: 0940 OH2TI heard only.

8/2: 0532 JA1BK, 0913 DK3EG, 0916 DL8HCZ*, 0930 G3SDL, 0935 DK6JL, 0937 ON4PS*, 0940 PAEVI who used a vertical dipole, 0940 SM7FJE, 0941 SM7AED, 0942 OZ8RW, 0945 PA0OOS, OZ8RW, 0946 PA0HIP, 0947 SM7SCO, G3WOS, 0948 PA0FM, 0948 G3FG, OZ1ELF, 0949 GJ4ICD*, G3VFY, 0950 GW3MFY* G4MKF, 0951 G4CCZ, 0956 G3HBR, 0957 G3NVO, 0959 PA3OIC, 1000 DL9AAL, 1004 PA2HJS, 1005 ON4AMX, 1006 OZ1DJJ, 1015 SM7BAE, 1016 PA0OOS, 1024 OZ1BVW, 1025 OZ6OL, 1026 OZ8RW, 1035 SM7FJE, 1059 OH2TI, 1100 SM7FJE, 1104 DL8HCZ.

17/2: 1021 DJ2PL, 1026 G3UKU, 1046 OH2TI. 19/2: 0936 G4UPS — this contact at 16,921.6km represents the greatest distance ever worked from the British Isles and a new VK3 distance record. 20/2: 0930 9H1CG*, 0945 GJ4ICD, 1005 ZC4MK*. Thanks for the info, Steve.

Steve also advises working W4, 5, 6, 7 on 29/3 and that 6m operation has been authorised for UL, UG, UH, SV5 and SV9.

Peter VK8ZLX is the next one to send a log extract, and it is interesting to compare the dates on which European contacts took place from Alice Springs in relation to other areas of Australia; all contacts were on SSB and he too did not waste time between contacts!

7/2/91: 0935 OH2TI calling CQ on CW. 15/2; 0830 PA3ECU, 0836 PA0HIP, 0840 PE1LRG, 0844 PA3EUI, 0854 OH2TI, 0855 PA0OOS, 0859 PE1MHO, 0901 G4HBA, 0902 G6HKM, 0903 PA3FHK, SM7FJE, OZ1LO, 0904 SM7SCJ, 0905 G4UPS, DL8HCZ, 0906 SM7AED, 0907 OZ8RW, OZ3ZW, 0908 OZ1DJJ, SM7CMV, SM7JUO, 0909 PA3FHK, 0911 DJ2RE, 0912 DL6DN, 0914 PA0FM, 0915 DL0TD, 0916 OZ1BVW, 0918 DL9GU, OZ1ELF, 0924 G8DJW, DL9?R, 0929 OH2HK, 0930 OH2KT, 0933 DK5UG, OZ3ZW, 0934 G3COJ, 0936 G1GVA, ON4PS, OZ6OL, 0942 G4CCZ, 0943 G4AHN, 0945 DL2ZBN, JF4PTQ, 0946 G3UYF, 0948 DL9RM, 0949 DJ3TF, 0952 G8ADM, G3RFS, PA3EUI, 0955 F6FEF, PA3BGM, PA0LOU, 1007 PE1LCL, 1014 ON1KVL.

While at work during openings missed LX1, 26/2: 144 to 145MHz JAs with heavy distortion! 27/2: 0810 OH2TI working VK4s in Brisbane; 0932 OZ8RW, 1026 LA9ZV, 1053 GD3AHV, 1054 G3BJD. 28/2: 0914 HL2IPL.

3/3: 1009 OZ1ELF, 1010 OZ1BUW, 1012 OZ6AS, OL1DLH, 1013 OZ7IS, 1014 OZ1LIT, OZ1FDH, 1016 SM6MNS, 1017 SM6FHZ, 1018 SM6CMU, 1020 OZ4VV, 1021 DK6AS, 1023 GM2WOJ, 1024 SM6MVS, 1028 SM6PU, 1031 OZ1IPU, 1033 DJ8MT, 1035 G8GXP, 1043 PA2HJS, 1045 G4MLF, 0146 DJ3OS, 1047 G3NVO, 1048 G8ADM, 1050 F6BSJ, DL0AL, 1052 LX1JX, DJ0GA, DJ4AF, 1054 DL7AV, 1055 G3SDL, 1056 G3TCI, OE2LFA, 1058 OE5XBL, 1100 DL7ZB, OV5PAM,

OV5OLL, 1103 OV5PAM, OE5KE, 1105 OE5UAL, DL9AAK, DL4OAN, 1118 12CCD, 1119 IK2GSO, 1120 IK1EGC, 1139 JA5KTN, 1141 JA4CQS. What a night!

4/3; 0825 PA3EUI, 0830 PE1BNL, 0832 PA3DYY, 0833 PE1NOT, PA3ECU, PA1NHA, 0834 ON1AME, DK6JL, 0900 OH2TI, 0905 OH2HK, 0909 OZ8RK, 0910 SM7CMU, 0911 G4ASR, 0912 SM7FJE, OZ6OL, G4UXC, 0914 GW4EAI, JP3PJD, 0916 JP3RMX, PA0HIP, OZ1DJJ, 0917 OZ1FDH, 0918 GW6UZW, 0920 SM7AEA, DL8HCZ, 0922 G8GXP, 0923 SM7BAE, 0927 JQ3VDN, G4CVI, 0930 G4MUT, 0933 G3NSM, 0934 G2EOS, G3IBI, 0935 G3HBR, 0937 G3ZSS, 0938 G4CEZ, G4MUB, 0940 JP3TNH, 0948 SM7CMV, JH1TCA, 1000 LX1SI, 1002 PE1AED, 1005 PE1MAE, PE1NCA, 1024 F6BSJ, 1025 GI4OPH, 1027 DJ3OS, 1039 DF4IE.

5/3: 0907 JA1WZX, 1031 OH2TI, 1032 LA9ZV, 1034 OH2MNE, 1037 OK2HK, 1050 OH1AYQ. 6/3: 1052 OZ8RW, 1103 OZ33ZW. 14/3: 0737 OH2TI. 28/3: 0008 KG6UH/DU1, 2234 A35EM, FO5NK. 29/3: beacons from VS6, V73AT, ZD8VHF. 30/3: V73AT.

John VK4ZJB advises of a log with a different coverage, that of the period from October until March, and indicating his better contacts which also include some from Europe. In many cases, other Brisbane stations were also making similar contacts.

7/10/90: 0803 JD1BFI Ogasawara. 8/10: 0835 AH3C Johnston Is. 13/10: five W6s. 16/10: 9L1US long path. 19/10: KL7Y Aleutians, HL1EIZ, V73AT. 21/10: 0455 V73AT. 24/10; HL1EIZ. 26/10; 0012 ZK3F, 0130 ZK3KY. 27/10: 0046 KL7NO. 30/10: 0125 AH6Q/MM. 4/12: 0019 VK9NS, 0036 VK9LE. 17/12: 0422 KD7P Kure Is. 30/12: 0839 VK9YQS.

2/1/91: 0712 3D2PO. 1/2: 0205 6W1QC on CW. 6/2: TS0AA. 17/2: KE6QS — also by Peter VK4APG, 0645 HL2FH. 18/2: 0350 HL2IPL, HL5BAS, 0455 KD7P/NH7. 24/2: 0140 6W1QC on CW and SSB — also by VK4APG and VK4PU. 26/2: 2255 KL7NO. 27/2: 0800 OH2TI, 0810 OH2BG, 0812 OH2BK, 0908 HL9XB, 0935 DL8HCZ, 0940 DK2PKR, 0941 PA0HIP (worked by many stations in Brisbane), 1002 DJ2AX. 1/3: 0941 KH4AE Midway Is. 2/3: 2245 6W1QC. 3/3: 0920 KH4AF, 2325 AH6HAP/KH7, 2335 NL7OW, 2237 V73AT followed by W6, JA and KH6.

John VK4ZJB says there have been openings to W6 with a good one on 26/3 between 0100 and 0150 and worked W6STI, W6QXZ, N6CW, AA6TT, W6SJR and heard the V73AT keyer. Also on 26/3 at 1150 John and Nev VK4ZNC worked JH1MAD/JD1 on Minami Torishima for a new country. VK4APG and VK4ZNC worked KG6UH/DU1. Later, at 2228, John worked another new country in KP2A and reported that during the morning period contacts from Brisbane were made with A35EM, FM5WD, KP2A, FO5DR, PJ9JT and KH6. Signals appeared to be stronger than in 1989. On the UTC morning of 1/4 VK4KJL started at 2100 with HH7PV. He was soon joined by VK4ZJB and others and the offerings included PJ2, 6Y5, FO5NK, TG9AWS, W6s and ZLs!

On Other Bands

I am indebted to Ron Cook VK3AFW for recognising my general forced absence from the VHF bands, and he has put together the following information to fill in the blank spots, particularly as it applies to the Melbourne area.

Ross Hull Contest

After an absence of six years, Ron has returned to the tunable sections of 2m and 70cm and reports that during the Ross Hull contest of December 1990 there were up to 50 stations active on those bands from the Melbourne area, although rarely were more than four heard on the band at the same time. Regulars worked by Melbourne stations on both bands included Des VK3CY Wedderburn, Roger VK3XRS Sarsfield, VK3DLM Korumburra, Trevor VK5NC Mount Gambier and Chris VK5MC at Hatherleigh. Those on 2m only included Brian VK3BBB Traralgon, VK3DQW Drysdale and Andrew VK7ZHA at Devonport.

Other stations active during this period included VK7ZAP Devonport 2m and 70cm), Colin VK5DK Mt Gambier 2m, George VK3HV Morwell 2m, Graham VK3NE and others portable on Mt Skene 2m and 70cm, VK3BEH Hamilton 2m, Joe VK7JG Launceston 2m, Ian VK3ALZ/P Waranga Basin 2m, VK3ATK Bendigo 2m, VK3AIH Portland 2m and 70cm, VK3ELV Wangaratta 2m and 70cm, VK3DQW/P Grampians 2m and Mark VK5ZMK/P Mt Lofty Ranges 2m and 70cm. Melbourne and surrounding stations included VK3s, BRZ, TU, AUG, ELS, ZBJ, ALZ, VF, TG, YTV, AMZ, ZJC, AFW, CAP, KKW, ACA, KSD and TFE.

Stations on 23cm included VK3s ZBJ, XRS, ZJC and ELV. Les VK3ZBJ and John VK3YTU had regular QSOs on all bands between 50MHz and 10GHz with the exception of 5.6GHz.

Aircraft Enhancement Contacts

Using the above mode, contacts on 2m and 70cm continue each Saturday and Sunday with stations in Sydney and Canberra working into the Melbourne and East Gippsland areas. Participating stations include VK2ZAB, VK1BG, VK1VP, VK3XRS, VK3AUG, VK3AFW and VK3UM.

This is a reliable and under-utilised mode that requires a good, but not extravagant, station. A single Yagi with 10dBd gain, 50 to 100 watts output and a 1dB noise figure preamp with low loss coax will work most stations, given a large aircraft in the right place. Stations well placed in respect to aircraft flight paths and other stations will make regular contacts with lower power on either 2m or 70cm.

Ron VK3AFW says that the basic operating rule is to keep overs short. A station in Frankston (about 30km to the south of Oakleigh) will hear the DX before the Oakleigh station. Shortly after the signals fade out at Frankston they will become audible at Oakleigh. Signals seem to peak earlier on 70cm and do not last as long as 2m signals.

If a fraction of stations capable of using this mode successfully were to be on during the period 8-9am EAST, then the normal operating frequencies of 144.200 and 432.200MHz would need to be supplemented. It appears overseas practice is to use 10kHz increments either side of the nominal calling frequency.

VHF/UHF Field Day

Stations operating portable included VK3BRZ and VK3ATL Mt Cowley, VK3ALZ Mt Macedon, VK3CY near Wedderburn, VK3XEX near Ballarat, VK3KAQ Mt Allambie and VK3YTU Mt Buninyong.

VK6 DX

On the evening of 31/1/91 Brian VK6YAU was heard working Adelaide stations on 432.110. VK3s CY, ZJC, AFW and YTV were able to complete QSOs on 70cm, but no 2m contacts despite S6 QSB peaks. The next morning both VK3CY and VK3AFW worked Brian at 5x9 on both 2m and 70cm.

During the evening of 21/2 the band opened to Albany and Esperance (VK6AS) and several VK3s made good contacts. The following morning mobile stations were working into Albany via the Mount Macedon 2m FM repeater. At 2230 VK3AFW found the Albany beacon weak but steady. Wally VK6WG was on 144.1 working to Adelaide and Mount Gambier. At 2346 VK3AFW had a two-way CW QSO with Wally on 2m at 529 both ways, but no signals from Wally on 70cm. Wally worked stations in Geelong and Hoppers Crossing.

Bass Strait Tests

Andrew VK7ZHA and Ron VK3AFW have been running regular skeds on 2m most weekday mornings, and signals are always there over the 300km path but sometimes the QSB and weakness of the signal prevent a QSO being completed. CW is used and when signals rise above S3 a switch to SSB is made. Whilst VK7ZHA has an excellent takeoff, VK3AFW has a nearby partial obstruction.

Andrew has occasionally worked Des VK3CY during these skeds plus stations in Mount Gambier and once to Eyre Peninsula. On 3/3 he heard VK1AU working VK3XRS and managed a QSO with VK1AU shortly after and signals remained for about 10 minutes.

Beacons

Ron VK3AFW says that the usefulness of beacons has been proven this season. On 2m,

the Albany, Adelaide and Mount Gambier beacons have been particular helpful to Melbourne stations. Unfortunately the Melbourne beacon is still off the air, and the Geelong beacon made only a short appearance. It is believed the VK1 beacon has problems, and a number of others listed as operational are, in fact, not so.

Thanks for writing, Ron. At least the operations of the past few months on the bands above 6m have been documented.

Closure

It's been a busy month since I returned home from hospital. My overall health is good, but I am not yet walking. There seems so much to do after a long absence. I would like to have had more time to prepare these notes, but have done my best in the time available. Errors and/or omissions will have to be accepted, please.

Closing with two thoughts for the month: "The service we render to others is really the rent we pay for our room on this earth" and "One of the more discouraging aspects of life is that we get little praise for what we are going to do next week." Until next month, 73 from The Voice by the Lake.

50-54MHz DX Standings

DXCC countries based on information received up to 1 April 1991. Crossband totals are those not duplicated by 6m two-way contacts.

Column 1: 50/52MHz two-way confirmed contacts
Column 2: 50/52MHz two-way worked
Column 3: Crossband 50/52MHz to 28MHz confirmed
Column 4: Crossband 50/52MHz to 28MHz worked
Column 5: Countries heard on 50/52MHz

Callsign	1	2	3	4	5
VK4ZJB	71	75		4	
VK3OT	67	71			
VK4BRG	60	68			
VK2BA	57	58		4	
VK2QF	56	60			
VK4ZNC	53	61			
VK8ZLX	45	60		1	
VK8GB	42	42			13
VK4ALM	42	48			
VK3AMK	41	29			
VK4ZAL	40	50			
VK3AWY	34	36			
VK5RO	32	45		3	
VK3NM	31	34			
VK5LP	29	31			9
VK3AUI	27	28			
VK6RO	26	26		4	13
VK2DDG	25	26		2	13
VK6HK	23	32		1	3
VK4KHZ	23	34			
VK3XQ	23	25			2
VK4TL	22	23			
VK2KAY	21	23			
VK2BNN	20	21			
VK4BJE	19	25			
VK7JG	18	20			2
VK3TU	17	19			
VK4AYX	17	17			
VK9XT	17	17			4
VK2ZRU	16	19			4
VK9YT	12	14			
VK6OX	10	10		1	1
Overseas					
JA2TTO	48	48			9
YJ8RG	25	25			

The next list is planned for the usual time of August issue. Copy to me by 15 June please. Some amateurs have responded with the photocopies of their QSLs as I earlier requested. I await the other, please.

Stop Press

Steve VK3OT @ 2345Z (6/4/91) worked 9Q5EE in Zaire, central Africa, at 539 on 50.110MHz, which gives him WAC. This was a long path QSO over USA for a possible distance of 31,000km. It is possible some stations in VK2 and VK7 also worked 9Q5EE.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

Learning to Communicate

As you are no doubt aware, the mechanics of actually learning the code have been given plenty of discussion so, for now, let us assume that we have passed our 5wpm or even 10wpm exams, theory and regs, and obtained our first callsign. In this position there are many who manage to fire up a rig and, microphone in hand, proceed to forget all about the code they struggled so hard to learn. As a consequence, they may never find the enjoyment that a dedicated Morsiac has in being able to converse in code, although the Morsiac can pick up a microphone at any time.

Should you wish to put your code knowledge to the test, now is a good time to unplug the microphone from your rig and hide it somewhere relatively inaccessible. This may seem a bit extreme but it is an infallible way of ensuring that you do learn to operate using the code, and are not tempted to take the easy way out every time you get into difficulties. (I would be interested to hear from those who frequent practice nets where microphones are used to see if they agree, and to see what happens if they try discarding the microphone). For you can be sure there are plenty of problems ahead but, if you persevere, you will overcome them; and, if you don't have a microphone, you won't be able to dodge them.

For many people, speaking into a microphone for the first time can be a nerve-wracking experience. I know it was for me, and using a key for the first time was even more difficult. If you do get "the shakes" you can be assured that they will go away in time. And they will depart quicker if you are well prepared and not distracted by other things going wrong with your system. So take the time to make sure all your equipment is in order, the antenna(s) are tuned for the section of the band(s) you want to use, and that you can get away from outside distractions, even if you have to use headphones.

It will be a great help if you also have a set of phrases written down that you can use to send from, rather than have to think about phrasing and spelling while you are trying to send. It is preferable to use plain English at first, but a list of abbreviations should be available for your own reference. Many contacts follow a regular pattern, and it will be easier if you stick to that pattern at first. Here are some common phrases that you can have written down, starting with the 3x3 CQ call.

"CQ CQ CQ de VK3CQ VK3CQ VK3CQ K"

"This is my first QSO sorry about the mistakes"(!)

"Name is Gil, Gil, QTH is Bright, Bright"

"You are RST 599"

"Rig here is homebrew running 5 watts, antenna is dipole"

"Many thanks for the contact, 73 and cul ... etc"

You can fill in your own details and anything else you can think of. Naturally your first QSO should be a fiasco, and you may be so excited that you only copy half of everything that is sent. If you are really enthusiastic you can record the whole session on tape and play it back later, but don't worry if you have to ask the other operator to slow down or repeat if necessary; he won't mind at all. I found it convenient to write down everything I received in a notebook, and I still can refer to my very first contact. I'm only sorry I don't have a tape of it.

As anyone will tell you on air, if you can manage one or two QSOs per day you will notice that your "shakes" disappear in less than a week, and you will begin to enjoy contacting the "locals" you find on frequency. In no time at all you will be able to recognise them from the way they send, and you will be copying more and more without mistakes.

You may have heard it said that in just about any endeavour you get out that which you are prepared to put in, and this applies especially to Morse code. Whether you are learning Morse, golf, bowls, hang-gliding,

pistol shooting, or just about anything, there are distinct levels of achievement that you can aim for, and corresponding levels of effort required.

It is said that if you spend one day a week you will not improve and may regress. If you spend a couple of days a week you will stay at the same level. (This point may be the "plateau" that many will tell you about). And if you spend three or more days a week you will constantly improve.

So, if you can manage three or more evenings on air, you should have no trouble improving to a competent level of operating in a matter of weeks. If you want to be able to work at speeds of 20wpm or more in comfort, you will need to spend about five nights a week on air for a weekly total of five or more hours on the key. This is not really as much as it sounds. Usually one QSO will take about 30 minutes, so five hours will give you only about 10 contacts a week. In practice you will often find that you want to talk to more operators and that you are spending two or three hours at a time chatting away with the "locals" who are on the frequency.

While five nights a week may be too much to expect, even a couple of sessions of two or three hours each every week should show a marked improvement in performance. Once you feel yourself beginning to relax at the key while sending, you will start to really enjoy the hobby. You should find too that there is not as much need to write everything down as you copy it; you can just lean back and relax, or think about your answer in the next over, and perhaps make a few notes.

At this stage, you may want to work on your speed and accuracy, or try contesting. The "shakes" will be a thing of the past, and you'll have made it! You will find pleasure in copying difficult sending, or copying through bags of QRN/QRM, and you should have no trouble at all in recognising the "locals" by their "fists". Welcome to the ranks. **ar**

AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074
PACKET: VK5EA@VK5WI

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information Nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz

(7.064MHz is the frequency presently in use)

AMSAT SW PACIFIC 2200 UTC Saturday, 14.282MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net.This information is also included on some WIA divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia, and now has about 340 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services, send a SASE to Graham.

Subject: RS-12 Mode-K Operational
HR AMSAT News Service Bulletin 089.01 from AMSAT HQ

Silver Spring, MD, 30 March 1991
To all radio amateurs BT
First QSOs on HF mode of new Bird

Andy MacAllister WA5ZIB reports success on Mode K of RS-12.

"At 1625 UTC on 24 March 1991 I heard the 10m telemetry beacon of RS-12. The signal was relatively strong as usual, but the annoying "garbage" in the passband was gone. Instead, I heard SSB activity from what appeared to be shortwave amateur activity. It was. The Mode K transponder was operational. After a few short CQs using an uplink frequency of 21.237MHz, Judd W1PEA came back and I had my first "K" QSO via RS-12. My HF antennas are inverted Vs in the attic and the power output on 15m was about 20 watts. The new bird is working well!"

LO-19 and DO-19 Problems
HR AMSAT News Service Bulletin 089.02 from AMSAT HQ

Silver Spring, MD 30 March 1991
To all radio amateurs BT
LUSAT Experiencing Ground User Difficulties, DOVE in Safe Mode

Numerous ground station operators around the world have reported difficulties accessing LUSAT (LO-19) over the past several days. Ordinarily, connection can be established but little other traffic can be handled. The LUSAT command team in Argentina is examining various possibilities including PACSAT software problems and satellite receiver problems in various hardware configurations. LUSAT is transmitting a short beacon message to users alerting them of the degraded situation.

The DOVE (DO-17) operating system apparently crashed sometime on Thursday 28 March 1991. On Saturday 30 March 1991, the S-band transmitter was successfully commanded-on providing very limited telemetry data, power system balance, and (most importantly) evidence that DOVE is still quite alive. A concentrated effort to place DOVE into full service is planned following diagnostic memory dumps and an operating system reload during April. Special thanks go out to PY2BJO and ON6UG for their critical S-band monitoring duty.

New AO-13 Transponder Schedule
HR AMSAT News Service Bulletin 089.13 from AMSAT HQ

Silver Spring, MD 30 March 1991
To all radio amateurs BT
AO-13 Spring Schedule Announced, AO-10 Not Presently Available

Note: The AO-13 magnetorquing schedule was disrupted by geomagnetic activity last month. The current attitude is thought to be:

BLON=200.2 BLAT=-6.7

The current schedule is:

Off:	MA 220 to MA 035	
Mode-B:	MA 035 to MA 220	
Omnis:	MA 240 to MA 060	

Once the magnetorquing is completed, the "27 March 1991" schedule will be instituted. The AO-13 transponder schedule through 19 June 1991:

Mode-B:	MA 000 to MA 095	
Mode-JL:	MA 095 to MA 125	
Mode-LS:	MA 125 to MA 130	
Mode-S:	MA 130 to MA 140	
Mode-BS:	<discontinued>	Note 1
Mode-B:	MA 140 to MA 256	Note 2
Omnis:	MA 240 to MA 030	

The target spacecraft attitude is:
BLON = 180 BLAT = 0

Note 1: The transponder schedule for 27

March 1991 to 19 June 1991 will see the end of Mode-BS because Mode-S operation while the Mode-B transponder was active was impractical due to interference from Mode-B users.

Note 2: Originally the attitude change back to 210/0 was planned for early May because solar eclipses affecting AO-13 begin on 22 May 1991, and in the past it has been the AO-13 command team policy not to magnetorque during eclipses. However, in August this year we have no choice but to magnetorque during the eclipses, so it was thought that we could gain some experience in magnetorquing during eclipses in June with a bonus of an extra month of operation with the more favourable attitude of 180/0 in the process.

The downside of this proposal is that all transponders will have to be switched **off** from MA 200 through perigee to MA 035 from 22 May 1991 to 24 June 1991 even though magnetorquing will not start until 17 June 1991. Having the transponders **off** from MA 200 to MA 035 from 22 May 1991 until 17 June 1991 will give us an opportunity to gauge the state of the battery prior to the start of the eclipse.

Currently OSCAR-10 is obviously not receiving sufficient solar panel illumination to support even the beacon, much less the transponder. **Please do not** attempt to use OSCAR-10 until further notice. This period of dormancy is expected to last for several months. As soon as OSCAR-10 can support Mode-B transponder operations, it will once again be released for general use. Early reports of OSCAR-10's beacon returning to full strength can be sent to VK5AGR @ PACSAT-1, @ UOSAT-3, @ 8J1JBS, or @ VK5WI.

Proposed New French Amateur Radio Satellite

Bill Magnusson VK3JT

Some sketchy details are coming to hand regarding the long-awaited French amateur radio satellite to be named "Arsene". It seems to have been the basis of a study program over several years at some 27 schools of engineering, universities and colleges in France.

Its history seems to parallel that of the UoSATs in England with input from commercial organisations anxious to avail themselves of a test platform in space. We can only hope that it's as successful as the UoSats.

The only details published so far indicate an apogee height of 36,000km, a perigee height of 20,000km and a period of about 17.5 hours. It will be placed into an equatorial orbit some time in 1992 by the same rocket used to launch a commercial communication satellite called TELECOM-2B.

It will be three axis stabilised, ie earth pointing at all times. It will carry several digital channels on mode B and a linear transponder on mode S as well as some experimental packages with telemetry downlinks for

NASA 2-Line Keplerian Elements

```
AO-10                  Epoch                Drag
1 14129U 83 58  B 91087.13157047 -.00000090  00000-0  99999-4 0  6439
2 14129  25.8083 153.6070 6004385 228.6767  81.5135  2.05883150 58557
UO-11
1 14781U 84 21  B 91087.59505918  .00005188  00000-0  94170-3 0  9472
2 14781  97.8121 135.3744 0013772  62.2623 298.0072 14.66570353377634
NOAA-9
1 15427U 84123  A 91087.20021679  .00001058  00000-0  91076-3 0  7186
2 15427  99.1731  98.7687 0014218 293.9234  66.0445 14.12919510324089
MIR
1 16609U 86 17  A 91088.12504994  .00067853  00000-0  67618-3 0  3447
2 16609  51.6071 333.5097 0015537 115.0173 244.2519 15.64886640292620
NOAA-10
1 16969U 86 73  A 91086.97583158  .00002033  00000-0  90085-3 0  5624
2 16969  98.5727 113.2251 0013806 160.0598 200.1146 14.24017780234998
RS-10/11
1 18129U 87 54  A 91087.84950366  .00000097  00000-0  99999-4 0  5670
2 18129  82.9242 116.2301 0013169  54.1551 308.0829 13.72165370188579
MET-2/17
1 18820U 88  5  A 91083.62243123  .00000420  00000-0  36624-3 0  4641
2 18820  82.5436 127.5364 0015019 256.8532 103.0962 13.84460246158985
AO-13
1 19216U 88 51  B 91055.02461838 -.00000020  00000-0  99999-4 0  2406
2 19216  56.8208 107.0310 7134717 248.7854  25.7533  2.09700788 20839
MET-3/2
1 19336U 88 64  A 91079.51407238  .00000049  00000-0  10968-3 0  7149
2 19336  82.5407  81.9375 0017639 348.1699  11.9013 13.16915477127322
NOAA-11
1 19531U 88 89  A 91088.21240260  .00002006  00000-0  11146-2 0  4735
2 19531  99.0216  42.4460 0011494 196.6004 163.4793 14.12038892129185
MET-2/18
1 19851U 89 18  A 91086.27035091  .00000701  00000-0  62028-3 0  4186
2 19851  82.5215   2.8990 0013536 297.1198  62.8595 13.84098645104729
MET-3/3
1 20305U 89 86  A 91083.78492777  .00000043  00000-0  99999-4 0  3274
2 20305  82.5503  20.0872 0018860 355.5322   4.5673 13.15942710 67852
UO-14
1 20437U 90  5  B 91087.70628769  .00001612  00000-0  65281-3 0  3293
2 20437  98.6784 167.6671 0012203  42.3198 317.9034 14.29009848 61491
AO-16
1 20439U 90  5  D 91087.18620936  .00001527  00000-0  61808-3 0  2110
2 20439  98.6708 157.4050 0012088  48.9803 311.2447 14.29098619 61422
DO-17
1 20440U 90  5  E 91086.26097029  .00001580  00000-0  63769-3 0  2118
2 20440  98.6766 166.5200 0012095  52.3672 307.8631 14.29160280 61293
WO-18
1 20441U 90  5  F 91086.44362980  .00001569  00000-0  63259-3 0  2101
2 20441  98.5739 166.7423 0012699  51.3876 308.8507 14.29229004 61327
LO-19
1 20442U 90  5  G 91087.19260508  .00001497  00000-0  60371-3 0  2127
2 20442  98.6767 167.5426 0013001  48.2439 311.9890 14.29306365 61438
FO-20
1 20480U 90 13  C 91069.51316601  .00000031  00000-0  97835-4 0  1895
2 20480  99.0193  70.4245 0540989 165.0177 196.7681 12.83171895 50905
HUBBLE
1 20580U          91086.77285543  .00012573  00000-0  13588-2 0  4033
2 20580  28.4663 242.6984 0005687 185.3941 174.8582 14.86980761 50182
MET-2/19
1 20670U 90 57  A 91087.00799621  .00000406  00000-0  35581-3 0  1633
2 20670  62.5413  63.3643 0014875 207.0448 153.0109 13.83930967 37777
FY-1/2
1 20788U 90 81  A 91087.59876210 -.00000401  00000-0 -25542-3 0  1211
2 20788  98.9489 122.7652 0015486  46.6461 313.6037 14.01090103 28921
MET-2/20
1 20826U 90 86  A 91087.78580277  .00000050  00000-0  58228-3 0  1182
2 20826  82.5104   1.8190 0014176 103.2975 257.0610 13.83311453 25095
AO-21
1 21087U          91087.14616609  .00000289  00000-0  29279-3 0   264
2 21087  82.9427 293.5967 0036275 122.5402 237.9267 13.74359194  7899
RS-12/13
1 21089U 91  7  A 91083.72491363  .00000292  00000-0  30027-3 0   284
2 21089  82.9293 166.7116 0029654 151.3646 208.9150 13.73876059  6544
         Inclin  RAAN     Eccen   ArgPeri  MeanAnom MeanMotion  Orb
```

educational purposes./

If you want to see what the orbit will look like, try the following "home-grown" set of Keplerian elements in your tracking program:

Epoch year	=	1990
Epoch day	=	0
Inclination	=	0 deg
Argument of perigee	=	0 deg
Eccentricity	=	0.2355
RAAN	=	0 deg
Mean anomaly	=	0 deg
Mean motion	=	1.361 rev/day
Drag	=	0 rev/day/day
Orbit No	=	0

Be prepared for some surprises. I think you'll find the orbit characteristics most unusual and very interesting.

Even though the keps I'm using are home-grown, I think they're close enough to make the following observations about the proposed orbit. See if you agree.

Passes will be up to 30 or 31 hours long, and in time we will see nearly two complete orbits

SATELLITE ACTIVITY FOR DECEMBER 1990/JANUARY 1991

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1990-							
115A	Cosmos 2120	26 Dec	USSR	90.2	336	231	82.6
116A	Raduga 1-2	27 Dec	USSR	1474.0	36535	—	1.4
1991 —							
001A	NATO IVA	08 Jan	NATO	634.0	35463	736	25.9
002A	Progress M-6	14 Jan	USSR	88.4	224	192	51.6
003A	Italsat-1	15 Jan	ESA	626.6	35691	201	7.0
003B	Eutelsat-II	15 Jan	ESA				
004A	Cosmos 2121	17 Jan	USSR	88.7	275	177	82.6
005A	Cosmos 2122	18 Jan	USSR	92.8	432	413	65.0

2. Returns

During the period 16 objects decayed, including the following satellites:

1971-031A	Meteor 1-8	10 Jan
1986-083A	Cosmos 1788	21 Jan
1989-058A	Cosmos 2033	06 Jan
1989-092A	Cosmos 2051	21 Jan
1990-115A	Cosmos 2120	17 Jan

3. Notes

1991-002A Progress M-6 docked with spaceship MIR on 16 Jan to deliver expendable materials and other cargo.

Bob Arnold VK3ZBB

of the satellite!

The squint angle will vary from about 10-15 degrees for southern Australia and only a few degrees worse than that for the polar region limits.

The squint angle will get better as the satellite range increases but will deteriorate slightly as the satellite elevation decreases. The worse possible case looks like no more than about 18 degrees for Melbourne.

With three axis stabilisation there should be no spin modulation. (I wonder if the antennas will have circular or linear polarisation? It will probably be circular, as we'll still have to contend with Faraday rotation etc).

It will rise in our west-north-west, move through north at elevations of around 40 degrees, setting in our east-north-east (from Melbourne).

It will move slowly across the sky from west to east, seeming to hover almost stationary for up to eight hours around apogee. In fact, it's moving in long loops around apogee as the earth catches up to it. The earth's angular velocity is about 0.25 deg/min. At apogee, the satellite's angular velocity is about 0.217 deg/min, at which time its progress across the sky will appear to reverse. At perigee, it is about 0.563 deg/min.

It will spend about six hours moving quickly between apogee "loops".

We will normally see two apogees during each 31-hour pass, occasionally seeing only one around north and occasionally seeing portion of three apogee loops with the west and east apogees on the horizon at AOS and LOS.

From pass to pass, the apogees will increment across the sky from west to east.

Between passes there will be periods of up to 48 hours when it will not be in our sky.

When it rises or sets at apogee, it will be as much as 42,000km range, producing one-way path losses of 192dB at 2445MHz and 177dB at 435MHz.

It will experience quite serious eclipses around the equinoxes, from about 1 March to 15 April and again around 1 August to 15 October. The eclipses could be up to an hour in umbral shadow. When they occur over "Atlantic" longitudes, they may require one or both transponders to be shut down for short periods each orbit to prevent overloading.

The relative motion of the satellite to a ground station will be so low that, even at perigee, the rate of change of doppler shift will be barely noticeable when tuning in a signal. It will vary between the low fractions of one Hz per second on mode B to no more than 2Hz per second on mode S. **ar**

SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

As I predicted, the Gulf War ended very swiftly, even before I had finished my last column. The ground offensive lasted only 100 hours, with minimal casualties on the Allied side, while the Iraqis had horrendous casualties in the tens of thousands, primarily as a result of repeated air strikes. The fighting may have ended, but the agony goes on for the civilian population, now caught up in civil war.

On shortwave, there have been significant developments. Firstly, Radio Canada International in Montreal has severely cut back programming on shortwave, because of a budget blowout. The English and French services will now consist of relays from the domestic network, and will presumably have little or no impact on non-Canadians, not conversant with domestic events. Several language sections were axed, including Japanese, Portuguese, Polish and Czech. All programming in the remaining sections has been halved.

Well-known presenter, Ian McFarland, whose shortwave DX program was extremely popular, ironically left for exchange duty with Radio Japan the day the historic announcement was made. The program was also axed. Ninety-three other staffers also were dismissed.

However, the relays of RCI will presumably continue, as other international broadcasters such as the BBC World Service, Radio Austria International, Radio Japan, Deutsche Welle and Radio Korea continue utilising the Sackville, New Brunswick, site to reach North American audiences. It is ironic that I get clear signals of both the BBC World Service on 9515 at 1100 UTC, plus Radio Korea on 11740KHz, via the CBC Sackville site.

Another DX program I have recently come across is on Radio Korea from Seoul. It is aired fortnightly on Sundays at 1040 UTC on 11740KHz. The dates in May will be 5th and 19th. The DX program on Radio KSDA has been changed from 1030 Mondays to 2330 Sundays on 15610 or 0230 on 13720KHz. These times aren't really convenient for us in Australia because of the lack of propagation at those times.

Here in Tasmania we were on Daylight Saving Time to 31 March, when things reverted to Standard Time. The main push for the continuation of Summer Time for an extra two months comes from the travel industry, but is opposed by the commercial and rural sectors.

continued on page 42

The same day saw the introduction of Summer Time into the northern hemisphere. However, this year, the USSR decided not to introduce it after it was pointed out that in 1931, Stalin introduced it, but forget to revert to standard time in winter. So, in effect, the Soviet Union was on Double Summer Time. Yet some republics have opted to introduce Summer Time, namely the Baltics and Moldavia. One republic has even opted to put the clocks back in summer, namely Kazakh SSR.

Well, that is all for this month. Until next time, the very best of 73 and good listening.

ar

ALARA

JENNY ADAMS VK3MDR
70 KANGAROO GROUND RD WATTLE GLEN 3096

Thanks to Dorothy VK2DDB for the following article:

I had a wonderful time at the Gosford Field Day in mid-February. The Field Day Committee welcomed me warmly and I set up my table near the QSL Bureau. So many people stopped to chat and look at the "display". There were photos of the Dubbo Alarameet, magazine articles, a bit about the ALARA contest and a photo of the Florence McKenzie Trophy, plus many other bits and pieces. I could have sold my ALARA teaspoon about six times to "radio widows". I also took a tapestry of the steam train 3801 that I usually do in the winter, in case things became slow, but I did only a few stitches. It was a good way to open conversation, though, and lots of people (mainly retired OMs) want to see how it's going next year!

There were also a few people talking about clubs in their area and I found a chap interested in joining the Hornsby Club — after all, my OM is president. There is also a VK1 who showed interest in the Mid South Coast Club of which I'm also a member. Next year I'll have a list of clubs, if possible.

The Fisher's Ghost Club has some newly licensed YLs and took some application forms and gave me an address to follow up. A few ladies are interested in studying and asked me about training programs. One lady from the Hornsby area has relatives in ZL and is very keen.

The photo of the Florence McKenzie Trophy generated some talk about the contest, and the ladies' group at Dubbo drew comments about the number of YLs in Australia. I'm really looking forward to next year's Gosford Field Day.

In late February, Aimee FK8FA and I finally met. It was a very giggly day with many misunderstandings. Aimee's OM, Michel, does not speak much English, and I know even less French. John had "schoolboy" French from 30 years ago. Michel and John got on very well together, while Aimee and I talked non-stop and the children played coy. Ian had his four wisdom teeth out only two days earlier, so tried to stay hidden. Aimee may be back in September.

Official ALARA net Mondays 3580, QRM UTC 1030. YL DX net "222" Mondays 14.222 0600 UTC.

CHEERS FOR NOW 73/33 **ar**

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
FREEPOST NO 4 AG LOVEDAY RUBYVALE 4702

February Summary

Freq	Date	Time Z	ID	EMN	Logs X	Comments
7053/85	010291	2100+	-	R7B	28	Daily interference
10100	070291	1545	-	A3E	1	B/C music, Arabic???
14023.5	210291	0800+	-	F1B	72	250Hz 3rd reg 24hr stn
14044	020291+	mni	PKJ	A1A	7	Also hrd .030/.33/.035/.040
14048+	020291+	mni	-	J3E+L	48	Rad tel/n0n/tones 24hr stn
The above stn dropped its freq to 14.027/30 AsianR/T on 1002911 OHM??						
14058	dly	mni	-	AC3	68	Dual out/ch "Helschrieber"
14070	dly	mni	VBX	A1A	12	VPO de VBX/also VNF call VPO
14072	dly	mni	RMSU	A1A	2	+RMJY on freq
14075_	dly	mni	VRQ	A1A	35	also on 14069.5 & 14070.3
14080/88	290191	mni	VRQ	A1A	2	NPO on 14085 logged 10 times
Comment: At 070291/1200Z VRQ was using deliberately a B/C program to jam and QRM the freq. May be against our legal use! If so, go to it, sit on him and make this long-term pest vacate the frequency.						
14078	220191	0130	KFB	A1A	13	Freq varies 14076-14103
14095	220191	0800	VPC	A1A	14	Also on at 0130Z
14100	220191	0930	NZB	A1A	12	Also on 14100 & 14103
14215.5	220191	1000	TG1	A1A	13	Previously GT0
14217.5	190291	0505	V3LR	F1/F1B	7	RTTY 500Hz shift
18120	040291	1255+	-	A3E	2	USR B/cast music brd only
18124	040291	1315	-	A3E	2	As above
21032	210291	0300_	UMS	F1/A1A	32	18hr stn USR naval Moscow
21283.5	210291+	0840+	UMS	F1/A1A	41	As above F1B 250Hz shift
21345.5	210291	0945+	???	F1B	44	Transmits "piccolo tones" but mostly 250Hz 18hr stn
21405	2801/02	1000+	??	A3E	14	Comm B/cast & R7B

249950/24960/29120 & 28980... All comm b/casters, country of origin not established positively to date more sustained listening required, please.

My thanks this month to VKs 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 4EKA, 4YD, 5TL, 6RO, 6XW.

Congratulations to Karl VK6XW on his patience and persistence with VRQ; it has earned him the WIA Certificate of Excellence No 23. Thanks again, Karl, your notes are a pleasure to read.

It seems that maybe the "Woodpecker" has to some degree been superseded; very little in the way of observations of late. A note on this "bird" taken from *AR* April 1979 by Alf Chandler VK3LC (Fed IW C-ord, then) caught my eye while on a clean-up! It is true that the bird is only heard on the phone bands where voice envelopes can be rejected by the radar video circuit. Also, when someone is sending CW dots at 25wpm the Woodpecker usually QSYs within five minutes. I may consider having the article reprinted in full, sometime if warranted. Conditions on the bands have been variable. It is regrettable that the first 30kHz of 7MHz is close to unusable to amateurs in the evenings, so more logs in this area please. It would appear that many intruding stations appearing on our frequencies are in fact harmonics, which makes them even more difficult to trace. Those with a couple of receivers may like to do some detective work; Col VK4AKX finds this very rewarding ... and annoying! Cheerio for this month. So endeth my bit.

ar

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. All of the items given below are available in the Executive Office Library. As a special service to **Members Only**, a photocopy of any complete article is available for $2.50 posted. To circumvent any copyright problems, please be sure to state - 'The information is required for the purpose of private study'. Address your request to The Librarian, Executive Office WIA, PO Box 300, Caulfield South Vic, 3162.'

Antennas – Computer Software

MININEC: The Other Edge of The Sword. Roy Lewallen W7EL, *QST* vol LXXV No 2 Feb 1991 pp 18 - 22. il diags. A review article on an antenna modelling tool which can predict antenna input impedance over both a perfect ground and any real ground, given soil conductivity and permittivity. The near and far fields are also predicted. The limitations of the program are stressed; the reader is cautioned about acceptance of absurd results — hence the title above.

– Half siopers

More On The Half Sloper. John S Belrose VE2CV, *QST* — Tech Corres vol LXXV No 2 Feb 1991 pp 39 - 40. A discussion of the effect of a Yagi antenna on top of a tower also used to support a sloper. Both the radiation pattern and input impedance of the sloper are dependent on the presence and orientation of the Yagi. A λ/4 sloper showed a resonance at 0.68 times the desired frequency when used on a bare tower.

– Mechanical Details

Rugged Side-Mounting for Rotatable Antennas. Malcolm P Keown W5XX, QST vol LXXV No 2 Feb 1991 pp 30 -32. il diags and photos. A detailed design for a practical approach to the problem of mounting a rotatable antenna at less than the full tower height. The technique described ensures a rotation of 240° or more for a triangular cross-section tower.

– Yagi

Congratulations - It's a Beam! Frank J Burke VO1BZ, *QSTVE* March 1991 pp 3 - 4. il diag. A design for a two element 10m beam, using electrical conduit and a gamma match. Good results are claimed for this lightweight and inexpensive antenna.

Electronic Devices – Automotive

Digital Speedo. Jeff Monegal, *EA* vol 53 No 1 Jan 1991 pp 106-112. il photos, diag, cct, pcb and cmp. A construction project for a digital readout speedo which sounds an alarm if a selected speed is exceeded. The pre-set speeds are 64, 72, 84, 104 and 112kph.

The speed sensor consists of two magnets diametrically opposed on the tailshaft; a stationary coil in close proximity produces voltage pulses. The LED display flashes during overspeed, together with the sound alarm. The sound may be briefly muted when overtaking. The LED intensity is reduced when the headlights are operating. Circuit uses ICs and discrete transistors.

Intelligent Blinker Unit. Jeff Monegal, *EA* vol 52 No 2 Feb 1991 pp 108-112. il ccts, cmp, diag, pcb and photos. Design for a unit to replace standard indicator light flasher units. Unit senses distance run (adjustable) since activating indicators, and disables flashers after this distance. If the indicator switch has not reset, a warning buzzer sounds. A pair of magnets on the tailshaft gives pulses from which distance run is computed.

Versatile Low Cost Car Burglar Alarm. Rob Evans, *EA* vol 52 No 2 Feb 1991 pp 82-89. il cct, cmp, pcb and photos. The device is enabled by a dashboard switch, and disabled by leaving ignition key in 'accessories' position for two seconds. Four input circuits are provided; one has a pre-settable delay to allow normal exit or entry to the vehicle. Either rising or falling trigger voltages may be used to trigger the alarm. Three outputs allow for car horn or separate siren to be sounded, together with ignition disabling circuitry. A warning lamp, in various flashing or stable modes, indicates condition or history of alarm.

– Timers

The 'Flexitimer'. Rob Evans, *EA* vol 52 No 3 March 1991 pp 92-95. il cct, cmp, pcb and photos. A delay or on timer which can be set from seconds to a day. It uses an astable 555 oscillator followed by a 4020 CMOS counter chip. Suggested applications range from a parking meter reminder timer to a watering system controller.

Packet

TCP/IP Command Set Reference. Ian Wade G3NRW, *QEX* No 109 March 1991 pp 3 - 6. An updated version (1.6: 23 January 1991) of this command set presented in tabular form.

Power Supplies

Power Supply for GaAs FET Amplifier. Zack Lau KH6CP, *QEX* No 109 March 1991 pp 10-11. il cct, cmp and pcb. A specific design for an active power supply delivering ± 5V for a microwave pre-amplifier. The negative supply is derived from an NE555 oscillator. A transistor regulates the GeAs FET drain current.

Test Equipment

– Capacitance Meters

Low Cost Meter for Electrolytic Caps. J Emery, *EA* vol 52 No 2 Feb 1991 pp 116-17. il cct. A square wave is applied to the capacitor under test via a series resistor. The resulting triangular wave across the capacitor is applied to a monostable. The frequency adjusting potentiometer is varied until the monostable triggers, indicated by illumination of a LED. The potentiometer scale is calibrated for three ranges of capacitance, extending from 0.47 to 1500 µF. The device can apply a DC voltage to any aged electrolytics for reforming.

– CROs

New CRO Adaptor For Monitors — 1. Peter Phillips, *EA* vol 52 No 3 March 1991 pp 84-90, 107. il cct, cmp, pcb and photos. An interface unit which converts a PC monitor into a 1 MHz storage CRO. The time base is switchable from 5.3 µs to 262 ms; the amplitude display is adjustable from 50mV to 20V per division. Part one of a series of three articles describes the design and construction of a PC board for generating video synchronising pulses, and timing signals for use on the other two boards.

– Product Reviews

QST Compares: Peak-Reading MF/HF Wattmeters. James W ('Russ') Healy NJ2L, *QST* vol LXXV No 2 Feb 1991 pp 33-36, 63. il chart and photos. A direct comparison of 9 different instruments, viz: Coaxial Dynamics 83000-A, Comet CD-160H, Daiwa NS-660-PA, Diamond Antenna SX-100, Heath HM-2140-A, MFJ 815B, Mirage MP1, Nye-Viking RFM-003 and Yaesu YS-60. A chart gives a point-by-point comparison; a detailed review is shown for each product.

FTAC NEWS

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

More 6m Records

Two new state 6m record claims have been verified:

6 metres: VK3 VK3OT to G4UPS 16921.6km

6 metres: VK6 VK6RO to GI8YDS 14904.1km

Congratulations to VK3OT and VK6RO. A correction to the VK1 1296MHz record published in the last issue: the distance should have read 243.2km.

Transceivers – QRP

The BP-80: An 80-meter CW Transceiver. Mike Agsten WA8TXT, *QST* vol LXXV no 2 Feb 1991 pp 23 - 29, 32. il ccts and photos. A pair of MRF237 final transistors in parallel gives 5W output. Two varactor diodes, switchable between single and parallel use, allow a frequency spread of 20-30kHz per crystal; the tuning resolution of the control potentiometer is 12-15kHz per revolution. The design permits full break-in. An optional three digit frequency display is included. A source for a complete kit is cited.

Transmitters – Frequency Synthesizers

Direct Digital Synthesis. What Is It and How can I Use It? Dr P H Saul G8EUX, *QEX* No 109 March 1991 pp 7-9. il ccts and graphs. A general review of synthesizer theory, culminating in a discussion of DDS.

Glossary of Abbreviations

il The article contains illustrations, a list of which follows.

cct A circuit diagram

cmp A component layout drawing

EA *Electronics Australia*

diag A mechanical drawing

pcb A master drawing from which printed circuits may be produced

QSTVE *QST Canada*

The above items are reproduced from *Amateur Radio Technical Abstracts* Volume 1 1991 ISSN 1036-3025 — to be published.

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EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

A few months ago I set out my ideas of the responsibilities of the Education Co-ordinator. After presentation of this to Executive and extensive discussion, these ideas became the basis for a set of "job specifications" for the person in this position. It is now 10 years since I first took on this position. At that time the job specifications were fairly broad and I was able to attempt or initiate a number of activities, either because there was something I wanted to do or because I felt duty-bound to do it.

Activities which seem to have been successful or of significant value include most of the negotiations with DoTC over examinations, syllabus revision and devolvement, the production of sample examination papers and the Novice Study Guide, dubbing of CW tapes, this column, and provision of information to potential amateurs. Less successful were the attempts to run a weekly on-air Education Net, a project for production of radio materials for use in schools, and the many attempts to establish or maintain links with Divisional people involved in education. I have often been disappointed by the lack of feedback from members and Divisions when I have sought information.

Over the past year or so I have felt that the responsibilities of a Federal Education Co-ordinator have been diminished by the devolvement of examinations. Divisions and examiners are now dealing directly with DoTC in a number of ways that could not be foreseen a few years ago. But, as I have said before, there is now a very great need for co-ordination and co-operation between the various examining bodies. As the initial enthusiasm starts to fade and volunteers find that the workload does not diminish, an efficient examination system will be maintained only if there are ways of sharing the loads.

I am not sure how others see the new examination system. Certainly some potential examiners saw it as an easy and sure-fire money-raising exercise. Many of these are now being disillusioned. Some clubs felt it to be a responsibility which must be accepted for the continuing survival of the club. Others saw a chance to give their students a better, less stressful opportunity to gain the necessary pass.

We must accept, however, that an efficient, effective examination system plays a vital part in maintaining the viability of the amateur service. Unless we have a steady, numerically significant inflow of new amateurs, commercial interests will be casting covetous eyes at our generous allocations of band space.

More importantly, we need those new amateurs as new members of the WIA. It is the activities and negotiations of the WIA, the body representing amateur radio in Australia at both local and international level, which protect our bands and privileges. Although the total number of licensed amateurs in Australia continues to rise, the WIA membership rises at a slower rate. But any benefits gained by the WIA members, and any loss of privileges will affect all amateurs also.

In the devolved examination system we have a simple, cheap potential recruitment scheme. All candidates at examinations run by any WIA division, affiliated club or member should be made aware of the vital role of the WIA, and be given every encouragement to join. It is not sufficient to simply hand out leaflets. Many new recruits will need assistance in starting out after gaining their licences. Similarly, they need positive persuasion to ensure that they are aware of the benefits of membership.

It has always been a tradition of amateur radio that the "old hand" helps the newcomer. By helping the new recruits to become WIA members, we are helping ourselves as well. **ar**

REPEATER LINK

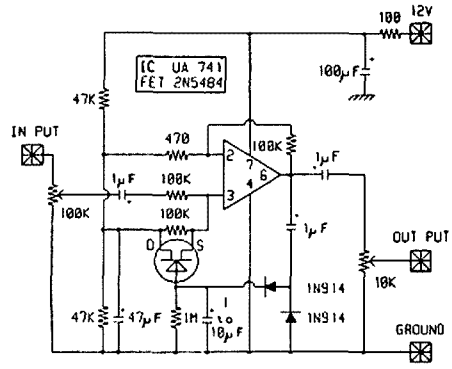
WILL MCGHIE VK6UU
21 WATERLOO CRESCENT LESMURDIE 6076

Audio AGC Amplifier

The circuit I have included in this edition of Repeater Link has been printed in several publications over the years and I can lay no claim to it. Several modifications to the circuit have also been printed but the circuit shown will provide level control of your repeater's audio.

Almost any op amp and N channel FET will work in this circuit. The input 100k pot sets the amount of compression on the audio and the output 10k pot sets the overall gain. A compression level of 6 to 10dB with 0dB gain would be the normal settings. With the gain set at 0dB the AGC amplifier can be placed in line straight after the repeater's receiver with no other changes to the repeater's audio circuitry.

The compression level time-constant is set by the 1M and 1 to 10µf capacitor connected to the gate of the FET. By changing the value of the capacitor the rate at which the audio level is wound up between breaks in the speech can be changed. 2µf would be a good starting point to experiment from. A short time-constant will



AUDIO AGC AMPLIFIER

bring up the background noise, such as vehicle road noise, to an unpleasant level.

Briefly, the FET acts as a variable resistance dependent on input audio level. The input 100k resistor connected to pin 3 and the FET act as a potentiometer. Minimum input audio level is around 100mV, and maximum input audio level around three volts. The two 47k resistors set the DC bias for the op amp so that a grounded supply can be used. Note the 470 ohm resistor is 470 ohm, and not 470k ohm; it is easy to make the mistake. When construction is finished, a quick DC check is to measure pin 6; it should be half supply voltage.

A modified version, including low frequency and high frequency adjustments to the audio response, has been developed. This circuit allows for the best sounding audio for your repeater, such that the output audio can sound as good, and often better, than the input audio. In a future article I will present this circuit.

ar

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

AGM Deferred: The 1990/91 AGM has been deferred until Saturday 1 June 1991 at Amateur Radio House. When nominations closed on 20 March there were insufficient for a quorum. A new closing date of 17 April was set. The formal notification appears in the annual report booklet. Listen to VK2WI for updates.

Historical Records: The VK2 historian, Jo VK2KAA, maintains an extensive record system on VK2 callsigns. You have no doubt met up with her at the various field days, completed the questionnaire and had your photo taken. It is important that details, however brief, are maintained. If you have never supplied anything, ask at the divisional office for a form, or check with your local club. One of the benefits from the records is the ability to check up on previous callsign holders. If you obtain a new call and are interested in who may have had it previously, then drop a note to the office via PO Box 1066, Parramatta 2124 or by fax on (02) 663 1525. Don't forget your own details.

Another important source of historic records is old QSL cards, and a reminder that these are also maintained in VK2. If you have cards to pass on from estates or the shack clean-out, remember VK2 before other collectors.

Oxley Region Field Day: This will take place as usual at Port Macquarie over the June holiday weekend. Details from the club at PO Box 712, Port Macquarie 2444. About 100 amateurs and members of their families attended the 43rd Urunga over the Easter weekend. If your club or group has an event coming up, remember to advise divisional office, both for its information as well as the broadcast. Give plenty of notice and send in a separate news item for each week publicity is required. Use A4 format, double-spaced typed or printed with a margin to the left for the announcer's file. Post, fax or deliver to Parramatta prior to 6pm Friday to meet the deadline. The Sydney Radio Group advises that its annual show will be at St Ives showgrounds on a date in August to be advised.

Third Gladesville/AUSSAT: Planning is under way for the next test. Listen to your local divisional broadcast for progress details.

New Members: The following joined the NSW Division during March, and a warm welcome is extended to them.

D R	Brown	VK2GFT	Epping
S V	Church	Assoc	Kincumber
R	Coster	VK2TGB	Sydney
C N	Cowan	VK2PZ	Kilaben Bay
J	de Caires	VK2MDC	Beverly Hills
E	Downs	VK2GKK	Bilgola Plateau
N P	Eichorn	VK2AOH	Orange
G	Frith	VK2GDF	Medowie
P K	Jordan	VK2KEY	Mount Warrigal
J M	Lawrence	VK2NSW	Liverpool
BS	Martin	VK2PWP	Woy Woy
R C	Selby	Assoc	Concord
S D	Smith	VK2AET	St Ives
D	Woollett	VK2IT	Beverly Hills

The May Trash 'n Treasure is scheduled for Sunday afternoon, 26th. Details will be given as usual on the broadcasts. Most of the publications which appear listed on the inside back cover of *Amateur Radio* are available from the office at Parramatta, 11am-2pm Monday to Friday and 7-9pm Wednesday nights. Phone orders and other calls between noon and 1pm (02) 689 2417.

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

Tea Tree Plaza Club

Perhaps because Adelaide is such a small city compared with Sydney or Melbourne we don't seem to have many suburban clubs, so it is quite an exciting event when we hear of a new club being formed. The latest is the Tea Tree Plaza Club (at least that's the general area, I'm not sure that that is its official title!) If you live in that general area and are interested in joining, the steering committee consists of Peter Watts VK5ZFW, Peter Gregg VK5PBD and Frank Ayling VK5NFA. Contact Frank on 251 4776 or Peter Gregg on 264 1070. I have a feeling that this might have stemmed from the Westfield displays — an added bonus!

Speaking of displays, the Chamber of Commerce and Industry has invited us to be part of a two-day exhibition at Wayville Showground on 22-23 June. After the success of the Westfield displays, council again feels that we should "grab" the opportunity. They will be looking for volunteers, so please, let a member of council know if you can help over this weekend.

Interstate Co-operation

We often hear of interstate rivalry so it's good to hear about some interstate co-operation. I understand that over the Easter weekend a group of SA ATVers (about nine, I think) was heading in the direction of Mildura to help the western zone WICEN group with communication for the River Murray powerboat races. I hope a great time was had by all.

Diary Dates

28 May. The ESC team of David Minchin VK5KK and Mark Spooner VK5AVQ will talk on "Kits & Bits".

25 June (probably). Ian Hunt VK5QX will give a video/talk on "The USA, Alaska and through the Pacific".

QSLs FROM THE WIA COLLECTION

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139. PHONE: (059) 64 3721

The Marshall Islands — A Spoiled Paradise? (Part 1)

The Marshall Islands lie approximately halfway between Cape York Peninsula and the Hawaiian Islands. They consist of 34 islands and atolls roughly 240km apart running NW/SE for 1300km. Most of them conform to the classical atoll type having a narrow low-level land mass (mainly of islets) enclosing a lagoon. The eastern chain, Ratik ("Sunshine") contains Majuro (the capital and commercial centre), the western chain Ralik "(Sunset") contains Kwajalein, Eniwetok, Ebon and Bikini. All of the islands lie just a few degrees north of the equator and slightly west of the international date line.

The islands were probably discovered by the Spanish navigator, Loiasa in 1526, although some historians attribute the discovery to Alvaro de Saavedra in the year 1527. They owe their name to a little-known British seafarer, Captain John Marshall, who "rediscovered" them in 1788. The first European settlement was made by Germany 90 years later, in 1878. In the year 1885, and with the prior consent of the British authorities, Germany formally occupied the islands. (Spain had no effective administration of the islands despite proclaiming sovereignty in 1874). During World War I, Japan occupied the Marshalls, taking it from the Germans who had administered the islands as a district of German New Guinea. As a reward for its war efforts on the Allied side, the Marshalls became a Japanese mandate in 1920 under the League of Nations and, in 1935, was militarised (in violation of the mandate). It was from bases in the Marshall Islands that Japanese forces invaded Ocean Island and the Gilbert Islands (as they were then known). Invasion forces also from the islands occupied Nauru (see QSLs from the WIA Collection, *AR* May 1990). This was the situation until, after bitter fighting, US forces regained the territory in February 1944.

J9SIR

Early pre-war country listings do not specifically show the Marshall Islands. The prefix J had been assigned to Japan from an early date but there was no sub-division of the prefix except for J8 (Chosen — later called Korea). The *Radio Amateur Handbook* of 1937 lists the J prefix assigned to "The Japanese Empire" under Japan J1-J7, Chosen J8 and Formosa (later Taiwan) J9. There was a country listing for the Marshall Islands in *Amateur Radio* May 1937 (based on ARRL information) but no prefix was given. Both the magazine *Radio* January 1938 and *QST* Jan 1939 list the Marshalls as J9 and in January 1940 "Radio" listed it as J9P. No country lists were published by QST after 1939 until the post-war period.

There seems to have been very little pre-war activity from the Marshall Islands. However, the August 1936 edition of *QST* does report activity by J9PA, a Mr Suzuki on the island of Oulai. The same station was reported active in 1940 *(QST* May 1940). His prefix of J9P seems to be in accordance with the magazine *Radio* country listing of January 1940. Somewhat surprising is the use of the J prefix after the war by US service personnel. The J9SIR QSL shown belonged to Dave Fugman, who had the Stateside call W8SIR.

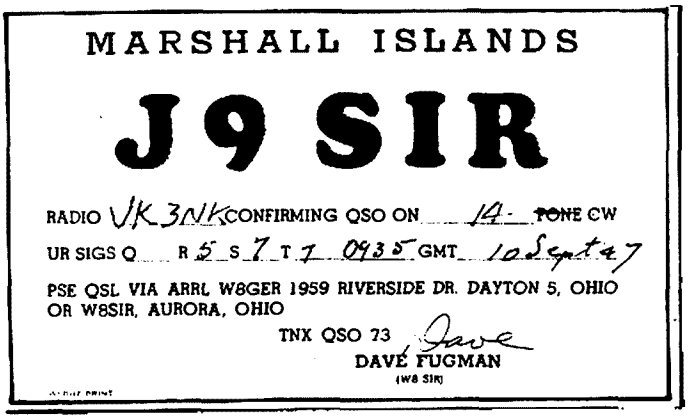
It was sent to SK Jim Ballinger in September 1947. The WIA Collection also holds the QSLs of J9AAQ (1948), W8RWW/J9, W6RJG/J9 (1946) as well as J9LG (1946). In 1948, listings were showing the newly assigned IARU prefix of KX6, the allocation being KX6AA-KX6ZZ.

KX6BU

This is the call of the Kwajalein (pronounced "Quad-ja-lane") Amateur Radio Club. Kwajalein is the US "Pacific Missile Range Facility" in the islands. A QSL from KX6BK states that it is the "largest atoll in the world". (This is quite correct, its enclosed lagoon measuring no less than 2300 sq km). The pictorial KX6BU QSL shows the Kwajalein settlement and its large airstrip on the most southerly point of the atoll. Other QSLs such as KX6DB and KX6DC show typical Nike Zeus missiles which play a part in the missile program. In fact, unarmed inter-continental missiles are fired from western California to land plumb in the lagoon, such is the accuracy of today's missile tracking. On the northern tip of Kwajalein Atoll is the settlement of Roi-Namur, KX6DC being the local amateur radio club callsign. Kwajalein was the first Marshall Islands territory to be captured by the Japanese in WWII. It is said that during its liberation, the concentration of fire by US forces exceeded any artillery barrage of either of the two World Wars.

KX6CG

This QSL, dated December 1961, was sent to the author from Eniwetok Atoll. It shows a drawing of an atomic bomb explosion. A series of US atomic experiments took place during the period 1946-1958, when no fewer than 66 bombs were detonated on Eniwetok and Bikini Atolls. It was the greatest atomic testing program in history, and strict military control over the native population was introduced during the period. (The Marshalls had become a US Trust Territory after the war under the United Nations). As shown on the KX6CG (Coast Guard) QSL, the US CG operates a LORAN (Long Range Radio, Navigation) communication facility on the island. Other QSLs such as KX6BP and KX6BT show pictures of the atomic blast. The atoll was handed back to the native Marshallese in September 1976 after 32 years of occupancy. (The native peoples had been living in exile on nearby Ujelang Atoll during the atomic testing period). It took many years for the atoll to become sufficiently "cool" radioactively, especially after the explosion on the atoll of the


MARSHALL ISLANDS

J9 SIR

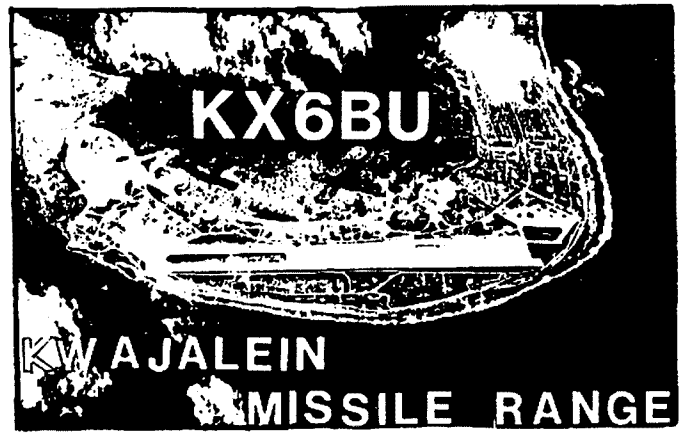
RADIO VK3NK CONFIRMING QSO ON 14- PHONE CW

UR SIGS Q R 5 S 7 T 7 0935 GMT 10 Sept 47

PSE QSL VIA ARRL W8GER 1959 RIVERSIDE DR. DAYTON 5, OHIO OR W8SIR, AURORA, OHIO

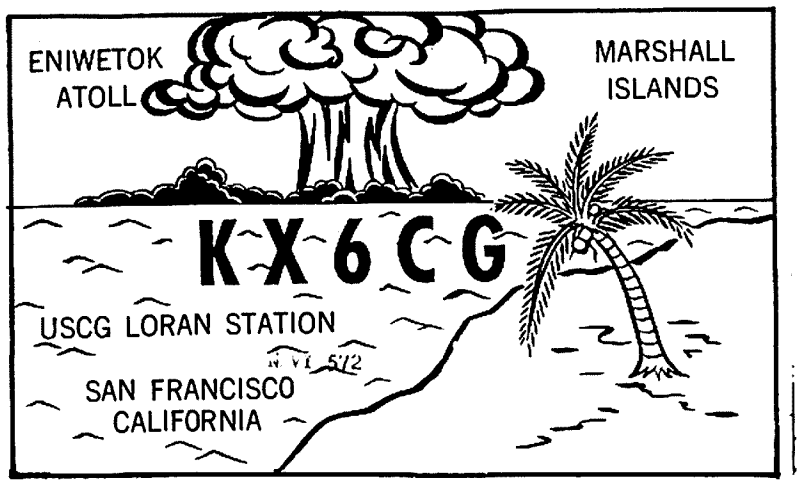
TNX QSO 73 Dave

DAVE FUGMAN
(W8 SIR)



world's first hydrogen bomb on 1 March 1954. Amateur radio operation has taken place from Bikini Atoll, the site of the first atomic bomb explosion in the Marshalls in 1946. The WIA Collection contains, amongst others, the QSLs of KX6BS on Bikini in 1956 and the interesting QSL KX6USN, the station of a "re-survey" scientific expedition of 1947 apparently whose aim it was to assess the 1946 atom bomb effects. (Little was known about the long-term effects of atomic radiation in those early post-war years). Although some attempts have been made at re-settlement on Bikini, surveys have shown that the atoll will not be adjudged safe for human habitation for another 30 to 90 years.

To be continued. ar



CLUB CORNER

Seated: FAMPARC members, Jessie Buchannan VK3VAN and husband, Gordon VK3BGB (club secretary, and Gwen Matthews.
Standing: SPARC members, Margaret Hamilton VK3END (social secretary), Vic Vickery VK3DEA (president), Frank Feldman VK3BC (secretary), Phil Carne VK3AAM (treasurer).
Seated beside Phil is Margaret Feldman.

Southern Peninsula Amateur Radio Club Lunch

Recently, the Southern Peninsula Amateur Radio Club (based at Rosebud) held its annual luncheon at the Rye RSL. The function was well supported by members and wives and we welcomed visitors from our neighbouring club, Frankston and Mornington Peninsula Amateur Radio Club (based at Carrum Downs). An enjoyable time was had by those in attendance. A number of other members wished they also could have been there, but were on the sick list due to a throat virus which has been raging in this part of the world.

TONY HAMILTON VK3ENE
PUBLICITY OFFICER, SPARC

South East Radio Group Inc

Well, folks, the time is fast approaching when that special weekend in June comes around. Of course I'm talking about the ever popular South East Radio Group Annual Convention to be held over the weekend of 8 and 9 June 1991.

The South East Radio Group has set a standard for amateur conventions which is unsurpassed in Australia. A good balance is maintained between trade displays and competitions to ensure that a wide range of tastes is catered for.

This year we are offering many exciting events which include the Australian Fox Hunting Championships. However, additional emphasis is to be placed on the home brew competition. Traditionally, this competition may not have been very encouraging to begin-

ners to the home brew arena, so this year we have created a number of sections to cater for the novice to expert. We hope that this will encourage everyone who likes to dabble in home-built equipment to show their prowess and compete for some attractive prize money.

The South East Radio Group convention promises to be a very popular spot on the amateur calendar so make sure that you don't miss out; book your accommodation early. A list of recommended motels and caravan parks is available by writing to the convention co-ordinator at the address below.

Hope to see you there.

DAVID EDWARDS VK5FF
CONVENTION CO-ORDINATOR
SERG
PO Box 1103
MT GAMBIER 5290

REMEMBER!

the North Queensland Radio Convention

for those interested in any facet of Radio Technology

27, 28 & 29th September 1991

at the James Cook University Townsville Campus.

For further information contact....

Townsville Amateur Radio Club (Inc) P.O. BOX 964 TOWNSVILLE 4810

or telephone 077-797869, 77-733487, 077-799721 or 077-791161

Townsville Amateur Radio Club

The Townsville Amateur Radio Club wishes to advise that the date for the North Queensland Radio Convention previously published was incorrect.

The correct dates for this most popular biennial meeting of all those interested in radio communications and related technology are: Friday 27, Saturday 28 and Sunday 29 September 1991 at part of the campus at James Cook University. Watch this space closer to the event for details of the convention program.

PO Box 964 Townsville 4810. Phone (077) 79 7869, 73 3487, 79 9721 or 791 1161. ar

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr C W Perry	VK2EO
Mr Richard Norman	VK2BDN
Mr Murray Palmer	VK3AMP
Mr Geoff Lewis	VK3BTT
Mr Harold Champion	VK4AKU
Mrs Phyllis Le Grand	VK4CPL
Mr E S Smith	L60069

Richard Norman VK2BDN

Richard died suddenly on 21/3/91 aged 66. He was born in Croydon and lived there all his life.

He started work in Sydney at Paul's, eventually moving to Slade's Radio.

He joined the AIF in 1940, and served with 2nd 11th AGH on Morotai where he formed a film unit.

After the war, he began work at GEC, where he remained until his retirement.

Dick was licensed as VK2ZCF in 1955 and finally acquired his full licence in 1969 as VK2BDN.

He was a keen builder of equipment and very particular in his construction work, receiving much pleasure from this.

Dick was the complete amateur and participated in fox hunts and scrambles and held 28 Ross Hull certificates, which must be something of a record. In 1982 he received the Ron Wilkinson Award. He held 1.2GHz record and was active on 10GHz for many years, and was involved in ATV and radio station 2RDJ.

Richard was straightforward and a good friend and will be sadly missed.

ROSS CRADDOCK USHER VK2ZRU

Geoff Lewis VK3BTT

I sadly write to report the passing of my very good friend, Geoff VK3BTT. Geoff passed away on 17 March 1991, following a short illness. On 18 February he had suffered a stroke. He was aged 66.

I first met Geoff in January 1979 when we were both novices and up to February this year my logbook records 575 contacts with him, plus half that many again which I forgot to log.

He had been a member of the Gippsland Gate AR Club, the EMDRC and, of course, the WIA.

Geoff will be sadly missed by his family and all those who knew him.

Farewell my kind and gentle friend; perhaps one day we will meet again. 73OM.

GEOFF VALENTINE VK3GV

Claud Singleton VK4UX

Claud passed away 14 September 1990 in Gatton Hospital, aged 76. Born in Fremantle, 22 January 1914, he started work as an apprentice baker at age 12. Claud started in radio in Rockhampton in the early 1930s; self-taught, he obtained his AOCP on 9 March 1935.

Claud joined the Army in 1939, serving four and half years and obtaining the rank of Staff Sergeant. After the war, he joined the PMG/Telecom and worked in many towns in North Queensland. Claud left his mark on many communities as foundation member of amateur and service clubs, as Scout master, as a pianist and piano teacher, and also with his photography, having many published in magazines.

Claud was a WIA member of long standing, past president of Dalby ARC, member of Ipswich and Toowoomba ARCs. He wrote many articles for AR and other magazines, and was news editor for WIAQ (1940s).

He was a news broadcaster (1950s), ran the call-back, held office on state council several times (most recently 1988 and 1989), obtained three RD certificates, won NFD twice. Claud was personally responsible for dozens of amateurs obtaining their callsign, being education officer for many clubs, as well as giving individual tuition. Claud was WICEN co-ordinator for Zone 3 until recently. VK4UX was a call widely known throughout the world, one time being known as "voice of Theodore". He leaves behind everlasting memories.

Sadly missed by his wife Jess and family,

together with all that knew him. Vale Claud, "not enough time".

BRUCE METZROTH VK4BLM.

Claud Singleton VK4UX

Claud founded the Dalby ARC, and was a contributor to VK4 council for many years; this included driving from Gatton to Brisbane for council meetings.

He was education officer for Toowoomba, Ipswich and Dalby clubs, and was a regular net attender including Queensland club liaison net, Queensland net, Coral Coast net and founder of Kookaburra net.

He was a "very young" 76.

Council and members thank Claud for his contribution, and offer condolences to Jess and family.

DAVID JONES VK4KLV

Harold Champion VK4AKU

Born in Melbourne in 1914, Harold spent his youth in the Bendigo area. His consuming passion for things electronic began in the 3rd Division Army Signals in 1932. In 1935 he joined the Victoria Police Force and was soon involved as a wireless operator in patrol cars and D24 HQ.

Around 1940 he joined the then-Department of Civil Aviation with which he remained until his retirement. His service included periods in Mackay, Rockhampton, Tennant Creek, Lord Howe Island, Adelaide and Mt Gambier.

Harold and his wife Win made frequent forays from their retirement home on top of the hill at Buderim. Amateur radio was a constant companion on their travels around Australia, across America, Africa, Canada and Europe. His children, born with the travel itch, have now scattered around the world, but have maintained links with home via amateur radio.

Harold maintained contact with his former work colleagues via the DCA and OTC nets and was an active participant in the ANZA and Coral Coast nets on a daily basis.

His sudden illness and passing came as a shock to all who knew him. A strong and gentle man, he will be sadly missed.

CU DAD

IAN VK2BWB

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

Comments about Comments

Why should the Packet Radio (Buzz Saw) Group be allotted an exclusive section of the 20m band, even though only 17kHz? The 20m band in its entirety should be available to all licensed to use it. What will be the next "elitist" group to get a similar privilege? The Packet Group should be prepared to share the bands with other users.

Re WARC-92, may I suggest that the WIA push for the widening of our MF band and HF bands rather than going for a lot of narrow bands throughout the RF spectrum. I agree 100 per cent with Dr S Bockner VK5VN re VNG and the problems of trying to set a clock from these signals. WWV/WWVH, or even JJY make it easier. Doing a time check last December with WWVH VNG came up. WWVH was still copiable until a station broadcasting a cricket match came up on top of these two! As for comments by Murray Young VK4GH, it is a case of "you must get the customers through the door first before you can sell them anything". Now for the Morse/no Morse argument. I, for one, would hate to see it done away with, for many good reasons. However, I would not mind seeing the Morse requirement being dropped for use of frequencies above 25MHz.

The government of the day can and does allot MF and HF bands to a variety of users qualification free.

GRAHAM J MUIRHEAD VK4WEM
23 CUNNINGHAM ST
WARWICK 4370

Amateur Textbooks

I read with interest your update on the need for a book or series of books to provide all the information that a complete beginner needs to go from novice to full call.

As a 62-year-old raw beginner with no electrical/electronic background, I was successful at the last DoTC-held NAOCP examination in February 1990, and upgraded to AOCP with the WIA examination in February 1991.

Other than establishing a definite study pattern, I attribute my success to three publications.

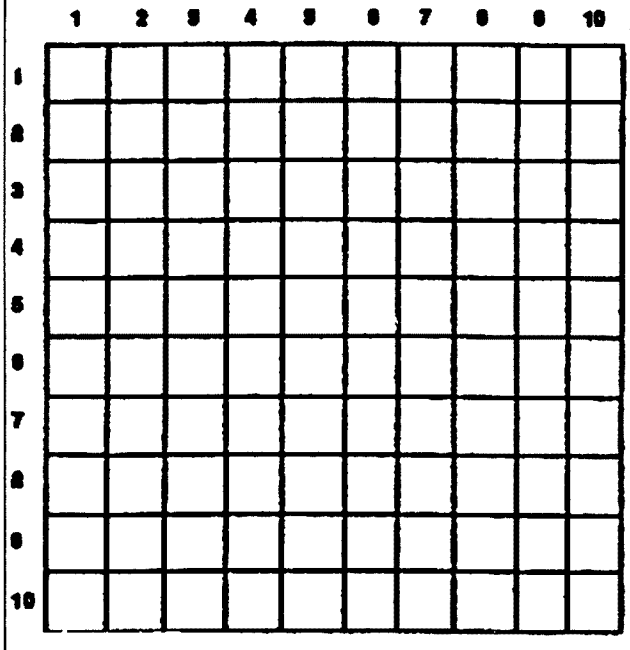
Two from the WIA education service as noted by Rex Black VK2YA, and the third was *Radio Theory for the Amateur*, by Swainston (available through WIA bookshops).

This last publication, while containing several errors (which I believe are corrected in the new edition) is, in my humble opinion, an excellent stand-alone textbook covering the full DoTC theory syllabus for novice to full call.

I would recommend it as an essential publication for any prospective amateur.

WES TYLER VK2WES
PO BOX 43W
WEST GOSFORD 2250

Morseword No 50



Across
1 Substance
2 Run
3 Sharp
4 Filch
5 Secure
6 High sound
7 Donate
8 Hindu widow
9 Bed linen
10 Planet

Down
1 NSW cheese town
2 Leave
3 Fibs
4 Beginning
5 Church house
6 Cover
7 Finished
8 Fairy's tool
9 Ins and ____
10 German city

Audrey Ryan © 1990

Solution Page 56

Reorganisation?

I found the letter from VK4XH (April '91 Over to You) very interesting. Reg says the WIA has to be market driven and provide what the customers want. How's this for some lateral thinking then? Fact 1 — less than 50 per cent of licensed Australian amateurs support the WIA by way of subscription. Fact 2 — *AR* magazine consumes more than 60 per cent of WIA revenue. Fact 3 — the commercial opposition magazine shows no sign of folding and, in fact, appears to be printed on better quality paper than *AR*. Without denigrating in any way the tremendous effort which goes into *AR* , how about Federal Executive doing a deal with Syme Media Pty Ltd for *AR* to become a pruned down insert in *AR*? Shock! Horror! Heresy! But wait — there is precedent for this. *Newsweek* finished up inside the *Bulletin*. *ETI* has been absorbed into *EA*. All licensed amateurs and others would then have the option of either buying the mag from a newsagent, not buying it, or subscribing to it from Syme Magazines. This would probably free Federal Office from continual complaints of non-receipt through the mail. WIA subs could probably be lowered somewhat, possibly leading to increased membership. WIA news would receive much greater circulation than at present. Advertisers would love it — no need to split the advertising budget. With the additional technical backing, a combined mag would be a resounding success, in my opinion. (Not to mention the fact that I would have only one pile of mags growing on my bookshelves instead of two!)

RAY JONES VK7RQ
314 ROKEBY RD
HOWRAH 7018

(Shall we burn him at the stake? Ed)

Value of CW

Allow me to correct, in no uncertain terms, my friend Geoff VK4VLI (Mar *AR*) who appears to think that — quote, "CW has nothing to do with real ham radio". What utter rubbish!

Geoff, I suggest you do a bit of listening on 10, 15 and 20m when the bands are open around the globe, like they are at present. And, on the weekend 9/10 March, it was bedlam, especially on 20m. The regular BERU CW contest unfortunately clashed with a JA contest, but despite the horrific QRM, several VK stations made over 500 contacts in the 24 hours. It is a well known fact that you can beat the QRM on CW, but not on SSB. So, don't knock this popular mode, Geoff.

In conclusion, isn't it strange that nearly all criticism of CW appears to come from persons who do not — or won't try to — use this mode.

T D DOWLING VK4OD
10 MOORABINDA ST
BUDERIM 4556

Fortress CW

In reply to Graham B Jackson VK3TFN, continued lowering standards for HF operating surely will make the fortress walls crumble. At what point do you want this CB mentality to stop?

Countries tried the experiment of dropping Morse (eg Spain) and quickly reintroduced the test.

It is a fact of life you have to be qualified to hold an amateur licence. Again I quote "No matter what our personal compassionate feelings may be".

I have many disabled amateur friends, and mention Ron McD Stuart VK2ASJ of Stockton NSW. Ron, a very disabled person, studied for the examination, Morse code and the lot, with help from his friends, and successfully passed. Difficulty in communicating by voice and very limited use of his arms did not deter Ron; he used Morse code. His Morse key is mounted on the floor under his desk, and he sends good CW with his foot. What a sense of achievement! So, please don't tell me any more about not being able to learn to read and send CW for a full call because, frankly, the fit-and-well whingers make me and many others quite sick. Per Ardua Ad Astra.

PETER ALEXANDER VK2PA
NANDARI
ROLLANDS PLAINS
VIA TELEGRAPH POINT 2441.

Standards?

Having read the article "An Overview of EMI/EMC in Australia" in March *AR* for the third time, I have to ask whether somebody can explain what it is about. If it purports to demonstrate that "something" is being done about EMI in Australia then it could have said so much more simply. It it is an extract (as opposed to a "reprint" as stated) then more explanation is needed for credibility.

The letters "CISPR" in the fourth line are not defined. Some of the table headings (eg "EN") are not explained (on "BS" I can put my own interpretation). If the article sought our help with EMI (which is important) then it needed more explanations.

The problems with "standards" is that they are **not**! My early physics taught me that decimal multipliers (Deca, Hecta, Kilo ...) are written with a capital letter and divisors (deci, centi, multi ...) in lower case. Without this elementary standard the whole system is confusing.

If we had a standard we might be spared from journalists writing about a "400 milliwatt power station" (400mW) or a 20 millibytes hard disk for a computer (20mb), the latter being twenty-thousandths of a "bit", which I had believed to be the smallest amount of memory.

An excuse has been given that a "Kilosomething" could be confused with a degree Kelvin. What rot — the whole is greater than the part, and usually the context will differentiate. If confusion **is** likely, then a degree sign should be written after K for Kelvin.

Furthermore, why do we speak of "kill-omm-itturs" (km)? Do those who do so measure their fuel in "kill-lolly-turs (kl) or weigh their vehicles in "kill-ogg-rms" (kg)? I think not. The comparison with "speedometer" and "barometer" does not stand up because both are entities for measuring, not a standard measurement.

In a technical discipline such as ours, these "standard" inconsistencies are bad news. Could this be another pioneering field for *Amateur Radio* to lead the way?

PETER HUGHES VK6HU
58 PRESTON ST
COMO 6152

*(It **was** a reprint, and could not be altered. CISPR is in the acronym list in Feb* AR *p27. EN is "European Norm". BS is "British Standard". Small k for kilo is standard, and large K for Kelvin. Agree with your comment on this, and agree strongly about mispronounced distances. Ed)*

RTTY Info Etcetera

I write with a suggestion for the next data issue of the magazine ... say for next February. When you next publish the data section would you think about including a list of the RTTY and AMTOR mailboxes, together with their locations, hours of operation and frequencies?

You could use the magazine space to request operators of these BBS-type devices to register these details with the WIA — not for permission to operate, but rather as a service to newcomers to the mode.

When such a list was published it would also give ideas about where a new mailbox system could be placed to supplement those systems already in use. Such a list should also include countries in our vicinity, including New Zealand and Indonesia.

Finally, I was saddened to read the long list of gear that has been reported stolen (in the same issue of *AR*). So much of that gear appeared to have no distinguishing marks. In the past, I have marked my gear with my callsign letters. It made me think: This weekend I **will** mark all my radio equipment with my driver's licence number and an "A" for the ACT. This will make the gear easy to track back to me. Perhaps if all amateurs were encouraged to do this, the market for stolen gear would dry up.

RICHARD JENKINS VK1UE
PO BOX 101
CHARNWOOD ACT 2615

(How about it, mailbox operators? Ed)

Reply to VNG Complaint

I must admit to being surprised by the comments from Dr Bockner regarding time-code transmissions from VNG, surprised that someone more scholastic than myself should find it so difficult to learn. I found that five minutes of listening was all that was required. The use of a clock would only seem to refer to someone like Dr Bockner, who may need one handy while they are trying to work out a simple mathematical addition. With regard to interference with the signal from WWV, I must point out that VNG transmits on 5MHz, 24 hours per day, and on 10MHz and 15MHz, transmission is from 8am to 5pm Eastern Standard Time, times during which WWV is not normally obtainable at my QTH. Also, VNG does not transmit the time-code during the times that WWV announces the time using voice operation, so it is still possible to listen to WWV if desired.

It should further be noted by Dr Bockner that there are numerous people, both in Australia and overseas, who rely on VNG for accurate time signals. Also, there are time signals being transmitted by other than WWV and VNG on these same frequencies, so I suppose this means that all these transmissions are to move to suit?

This, to me, is just another case of knocking Australian efforts. Why not get behind Australian products; there are many Australians who use and rely on VNG.

As a final comment, I wonder if Dr Bockner knows the difference between WWV and WWVH, and which in fact he is receiving, also, why have two time signal transmissions from the same country?

RICHARD MOORE VK2FRM
CAMDEN VALLEY WAY
NARELLAN 2567

Ten-Metre Piracy

Bravo VK5KJR, many of us can remember the piracy of our 11m band aided and encouraged by commercial interests in this country and overseas. How can one be anything but dismayed at the prospect of cheap 10m equipment being imported and sold freely over the counter. These units are already selling for less than $300. What happens when they fall to around $200 or less?We can kiss goodbye to 10 metres, that's what!

We've never been able to justify the retention of our very generous band allocation by usage or population, there just aren't enough of us. I've even heard it said that it wouldn't matter a great deal if we lost half our band space. Don't fall for that one! I don't subscribe to that theory at all. Our frequencies are **all** important. Sure, I don't use them all. No one could. It's doubtful if there has ever been an amateur who has regularly used all the bands. The point is that we don't know what's just around the corner. Who, 20 years ago would have foreseen some of the modes that are popular today? In a few years we may be experimenting with new modes requiring more band space than we have now. We can't afford to be complacent and give away any of our bands. Look what's happened to the 27.8MHz marine band and, I fear, what is about to happen on the HF bands with the easy availability of sets like CODAN.

As amateurs we should push for laws or regulations insisting on the production of an appropriate licence at the point of sale of **all** transmitting equipment. This is overdue by 20 years. It is done in the case of guns in the interests of public safety; surely spectrum anarchy falls into the same category. If you agree, contact your WIA divisional rep and let your feelings be known. Don't sit back and leave it to others (and then go crook later). If you don't believe this can happen, have a close listen to the bottom end of 10 metres **now**. We can make a difference. We can affect government if we speak with one voice.

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD
YARRAVILLE 3013

Cure for Piracy?

I would like to offer my personal support to James Robertson VK5KJRs letter in *AR*, April 1991. As he correctly states, we humans tend to be poor students of history.

Whilst I believe his comments to be correct, I have never been able to fathom out why our legislators in their wisdom appear to act only after "the horse has bolted".

Surely suitable laws could be enacted such that only persons with an appropriate category of radio licence are able to purchase and/or own radio transmitting equipment.

We would certainly not be the first country to have such laws, and it would save the taxpayer untold dollars currently being spent on DoTaC staff trying to track down unlicensed operators in the radio spectrum.

There is already a precedent for such legislation. In most, if not all, states of Australia it is illegal to purchase or own most type of firearms or explosives without an appropriate permit or licence. So why not radio transmitting equipment?

Now is the time to act; let's not let this degenerate into another 27MHz debacle, because history does tell us that in cases like this, once the floodgates have been opened there is little or no chance of turning back the tide.

BRUCE R KENDALL VK3WL
8 WALWA PLACE
WERRIBEE 3030

REMEMBER TO LEAVE A THREE SECOND BREAK BETWEEN OVERS WHEN USING A REPEATER

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

This month the charts provide predictions directly in signal strength (which you can relate to S-points), a much more usable and understandable form.

The base reference signal strength is **1 µV in 50 Ohms**, which, on the "Standard Scale For Amateur S-Meters" (see Ref 1), is between S3 and S4, as the following table shows:

µV in 50 ohms	S-points	dB(µV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	-2
0.39	S2	-8
0.2	S1	-14

The charts are otherwise exactly the same format, and based on the same parameters, as I have used previously.

New Prediction Program

This development follows some nine months of work in conjunction with a colleague of mine, Jack Middlehurst. An entirely new propagation prediction program has been developed, based on the model of the ionosphere developed by T Damboldt and P Suessman and used in their program MINIFTZ4, the program I was using to generate the predictions up till now.

This new program (written in the C language), known as Graph-DX, features a friendly 'user interface', based on a series of menu screens and a variety of output graphs, which can all be displayed on-screen (EGA, Hercules, VGA) as well as output to a variety of printer types. What you see on the screen is what you get on the printer (WYSIWYG propagation predictions!)

Output graphs can be presented directly in terms of **signal strength at the receiver** - either dB relative to 1 mW in 50 ohms (dBm), or dB relative to 1 µV in 50 ohms. Output in dB relative to 1 µV/metre field strength, is retained, too.

Plans are in hand to market both professional and amateur versions of Graph-DX. The first public demonstration, at the Blue Mountains Radio Club on 1st March, met with an enthusiastic reception. Stay tuned!

St Peter & St Paul Rocks DXpedition

Advice from Stephen Pall VK2PS, says PY0S will be activated in May from this remote outpost in the mid-Atlantic ocean off the coast of South America. From Australia, both the short path and the long path pass over the polar regions; bad news both ways!

Figure 1 shows signal strength predictions from Graph-DX for the 14 MHz band, short path, from VK East (top), South (middle) and West (bottom). Modest beams and 400 watts output is assumed. Horizontal axis is UTC time, signal strength is the vertical scale on each plot. The solid line is for 90% of days, dashed line for 50%, and the dotted line for 10% (enhanced conditions).

Ref 1 Signal Strength, "S" Meters and Preamps, Gordon McDonald VK2ZAB, *AR* July 1990 p 14.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.8	5	13.5	-1	6	5	0	-8
2	17.5	0	13.2	-11	0	1	-2	-8
3	20.3	0	16.0	-21	-4	0	0	-3
4	24.5	2	18.5	-30	-8	0	2	1
5	27.9	2	21.2	-35	-10	-1	2	2
6	27.5	2	20.9	-35	-10	-2	2	2
7	26.3	2	19.9	-32	-9	-1	2	1
8	24.4	2	18.5	-24	-5	1	2	0
9	21.9	2	16.6	-16	-1	2	1	-3
10	19.4	3	14.7	-8	2	3	-1	-8
11	17.1	4	12.9	0	4	2	-5	-15
12	15.3	6	11.5	5	5	0	-11	-24
13	14.1	10	10.6	10	5	-3	-17	-34
14	13.4	15	10.0	14	5	-6	24	...
15	13.0	22	9.7	18	5	-9	-29	...
16	12.6	25	9.5	20	4	-12	-34	...
17	12.4	27	9.4	20	3	-14	-37	...
18	11.4	29	8.7	17	-3	-22	...	...
19	10.2	31	7.8	11	-12	-35	...	...
20	10.1	31	7.8	11	-13	-36	...	...
21	13.0	28	10.1	23	6	-10	-32	...
22	18.4	21	14.2	30	22	13	1	-13
23	17.4	19	13.3	21	18	12	2	-10
24	19.3	14	14.8	12	14	12	6	-2

VK EAST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.0	12	13.7	10	12	9	1	-8
2	17.6	4	13.2	-2	5	4	-1	-9
3	20.4	2	16.1	-14	0	3	1	-3
4	24.9	4	18.9	-25	-5	2	4	3
5	28.3	3	21.2	-31	-8	0	3	3
6	27.9	2	20.9	-32	-9	-1	3	2
7	27.0	2	20.2	-31	-8	-1	2	1
8	25.3	2	18.9	-25	-5	1	2	0
9	23.0	2	17.3	-19	-2	2	1	-2
10	20.1	2	15.1	-10	1	2	-1	-7
11	17.2	7	12.9	-3	2	0	-6	-16
12	14.6	4	10.9	3	2	-3	-15	-29
13	12.7	7	9.4	6	0	-11	-28	...
14	11.4	12	8.4	8	-5	-20	...	...
15	10.8	20	7.9	9	-9	-29	...	...
16	10.6	25	7.8	10	-11	-33	...	...
17	10.6	27	7.9	11	-11	-33	...	...
18	10.6	28	8.0	12	-11	-34	...	...
19	10.1	29	7.6	9	-17	...	...	...
20	9.4	30	7.2	4	-24	...	...	...
21	9.7	30	7.4	6	-21	...	...	...
22	11.9	28	9.2	18	-2	-21	...	...
23	14.8	24	11.5	26	15	3	-13	-31
24	18.9	18	14.3	23	20	14	4	-6

VK STH - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.3	18	13.9	22	19	13	3	-8
2	17.9	10	13.5	8	10	7	0	-10
3	20.8	7	16.4	-4	5	7	3	-2
4	25.4	7	19.3	-14	1	6	7	4
5	28.6	5	22.2	-21	-2	4	6	5
6	28.5	4	21.5	-24	-4	2	5	4
7	28.2	3	21.3	-25	-5	2	4	3
8	27.5	3	20.8	-24	-4	2	4	3
9	26.1	3	19.8	-20	-2	3	4	2
10	24.1	4	18.2	-12	2	5	4	0
11	21.4	5	16.1	-4	5	5	1	-5
12	18.8	7	14.2	4	7	4	-2	-12
13	16.4	10	12.3	10	8	1	-10	-24
14	14.5	14	10.9	14	6	-4	-20	-39
15	13.3	20	10.0	17	3	-11	-31	...
16	12.6	24	9.4	18	1	-16	...	...
17	12.3	26	9.3	18	-1	-19	...	...
18	12.1	27	9.1	18	-2	-21	...	...
19	12.0	28	9.1	18	-2	-22	...	...
20	11.1	28	8.5	14	-9	-31	...	...
21	10.1	29	7.7	8	-18	...	...	...
22	10.1	29	7.8	8	-18	...	...	...
23	12.8	27	9.6	21	3	-15	-39	...
24	17.5	23	13.4	31	21	11	-2	-18

VK WEST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.3	12	11.8	10	12	8	1	-8
2	16.6	14	11.3	14	13	8	0	-11
3	16.0	17	11.0	18	14	8	-2	-14
4	15.2	19	10.5	20	14	7	-5	-18
5	15.0	21	10.4	22	15	6	-6	-20
6	15.5	23	10.8	25	17	9	-3	-18
7	17.1	22	12.0	26	20	13	2	-9
8	17.7	15	13.2	18	15	9	0	-12
9	15.0	9	11.1	9	7	1	-10	-23
10	12.9	0	9.6	2	1	-5	-16	-29
11	11.6	-11	8.6	-2	-1	-7	-17	-31
12	10.9	-19	8.0	-4	-2	-7	-16	-29
13	10.7	-32	8.0	-11	-7	-10	-20	-32
14	10.7	...	7.9	-20	-13	-16	-25	-37
15	10.7	...	8.0	-27	-18	-20	-29	...
16	10.1	...	7.6	-35	-26	-29	-39	...
17	9.4	...	7.2	...	-34	-38	...	...
18	9.7	...	7.4	-39	-31	-34	...	...
19	12.0	-29	8.8	-15	-7	-8	-14	-24
20	16.3	-8	12.6	-16	-4	-2	-5	-11
21	20.9	1	14.4	-15	-1	1	1	-3
22	19.7	5	13.6	-6	4	5	3	-2
23	18.8	8	12.9	2	8	7	3	-3
24	18.0	10	12.3	7	10	8	2	-6

VK EAST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.2	9	11.3	7	8	5	-3	-13
2	15.5	12	10.9	12	10	5	-5	-17
3	15.0	17	10.6	17	12	4	-7	-21
4	14.4	19	10.2	20	12	3	-10	-26
5	14.2	21	10.1	21	12	2	-11	-28
6	14.7	22	10.5	23	14	5	-9	-25
7	16.1	21	11.5	24	17	9	-2	-16
8	17.1	15	13.0	18	14	7	-4	-16
9	14.6	10	11.3	10	6	-1	-14	-28
10	12.7	2	9.8	4	0	-7	-20	-36
11	11.5	-6	8.8	0	-2	-10	-22	-38
12	10.9	-14	8.3	-2	-3	-9	-21	-36
13	10.6	-24	8.3	-7	-5	-11	-22	-36
14	10.5	...	8.1	-19	-15	-19	-30	...
15	10.4	...	8.0	-31	-24	-28	-39	...
16	9.8	...	7.7	...	-36	...	...	...
17	9.3	...	7.3	...	...	...	...	...
18	9.5	...	7.5	...	...	...	...	...
19	11.3	...	8.6	-37	-26	-26	-34	...
20	14.7	-15	11.7	-17	-5	-4	-7	-13
21	18.8	-5	13.9	-23	-7	-3	-3	-7
22	18.6	-4	13.1	-20	-5	-1	-1	-5
23	17.7	0	12.4	-11	0	1	-1	-7
24	16.8	4	11.8	-1	5	3	-1	-10

VK STH - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.8	-1	11.1	-5	0	-1	-6	-15
2	15.1	2	10.7	1	3	0	-8	-18
3	14.7	6	10.4	5	5	0	-10	-22
4	14.1	8	10.0	8	5	-1	-13	-26
5	14.0	10	10.0	10	6	-1	-13	-28
6	14.4	12	10.4	12	7	0	-11	-25
7	15.7	13	11.4	13	10	4	-6	-18
8	17.5	13	12.7	14	12	8	0	-10
9	19.0	11	13.8	12	12	8	1	-8
10	17.0	6	12.7	4	5	1	-6	-17
11	14.5	-1	10.7	-1	0	-4	-13	-25
12	12.6	-10	9.3	-5	-3	-8	-17	-30
13	11.4	-19	8.4	-7	-4	-9	-18	-30
14	10.8	-37	7.9	-16	-12	-16	-25	-38
15	10.5	...	7.9	-30	-23	-26	-36	...
16	10.5	...	7.7	-39	-29	-32	...	...
17	10.3	...	7.7	...	-36	-38	...	...
18	9.8	...	7.4	...	...	...	...	...
19	9.2	...	7.0	...	...	...	...	...
20	9.4	...	7.3	...	...	...	...	...
21	11.3	...	8.2	-31	-21	-23	-30	...
22	14.8	-15	11.4	-18	-7	-6	-9	-16
23	17.2	-8	12.2	-20	-7	-4	-5	-10
24	16.4	-6	11.5	-13	-3	-2	-5	-12

VK WEST - EUROPE L.P.

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.6	9	19.5	1	11	12	10	4
2	25.7	8	20.0	-1	10	11	9	4
3	25.6	8	19.4	-1	9	11	9	4
4	25.5	8	19.3	0	10	11	9	4
5	25.2	9	19.1	2	11	12	9	4
6	24.3	10	18.5	6	13	13	9	2
7	22.7	11	17.3	12	15	13	7	-1
8	20.7	14	15.7	21	19	13	3	-8
9	18.8	18	14.4	29	20	11	-2	-18
10	16.9	21	12.9	29	17	4	-13	-32
11	15.4	22	11.7	27	11	-4	-24	...
12	14.4	23	10.9	24	6	-11	-34	...
13	13.7	24	10.3	22	2	-17	...	...
14	13.1	25	10.0	20	-2	-22	...	...
15	12.5	25	9.5	16	-7	-29	...	...
16	12.1	26	9.2	14	-10	-34	...	...
17	11.0	26	8.4	7	-22	...	...	...
18	9.6	27	7.4	-5	...	...	...	...
19	9.4	28	7.3	-7	...	...	...	...
20	12.1	26	9.1	14	-10	-34	...	...
21	17.3	18	13.4	26	16	5	-10	-28
22	22.0	12	17.0	16	17	14	6	-3
23	24.6	11	18.9	10	15	15	10	3
24	25.2	9	19.3	4	13	13	10	4

VK STH - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.5	8	20.2	-1	10	12	10	6
2	27.4	8	20.7	-3	9	11	11	7
3	27.8	8	20.9	-4	8	11	11	7
4	27.6	8	20.8	-4	8	11	11	7
5	27.2	9	20.5	-1	10	12	11	7
6	26.4	9	19.9	2	12	13	11	6
7	24.9	10	18.8	8	15	14	10	4
8	22.8	13	17.2	18	19	15	8	0
9	20.0	17	15.1	28	21	13	2	-12
10	17.3	19	13.1	28	16	5	-11	-30
11	14.9	21	11.2	23	7	-9	-31	...
12	13.0	22	9.7	17	-5	-25	...	...
13	11.8	24	8.8	10	-15	...	...	...
14	11.1	25	8.3	6	-23	...	...	...
15	10.9	25	8.1	4	-25	...	...	...
16	10.9	25	8.1	4	-26	...	...	...
17	10.9	25	8.2	4	-26	...	...	...
18	10.2	25	7.8	-1	-35	...	...	...
19	9.4	26	7.2	-10	...	...	...	...
20	9.5	26	7.3	-8	...	...	...	...
21	12.0	24	9.4	12	-13	-37	...	...
22	16.8	10	13.0	13	8	0	-14	-30
23	21.7	9	16.7	8	12	10	3	-5
24	25.0	9	19.1	3	11	12	9	3

VK WEST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	23.3	9	17.9	6	12	11	7	0
2	24.3	9	18.5	2	11	11	8	2
3	24.8	8	18.8	0	10	11	8	3
4	25.0	8	19.4	0	10	11	8	3
5	24.9	9	18.8	0	10	11	9	3
6	24.7	9	18.7	2	11	12	9	3
7	24.2	10	18.4	6	13	13	9	2
8	23.1	11	17.6	11	15	13	8	0
9	21.4	13	16.3	19	18	14	5	-5
10	19.2	17	14.6	28	20	11	-1	-16
11	17.1	19	13.0	27	16	4	-13	-32
12	15.1	20	11.5	24	8	-8	-30	...
13	13.6	22	10.3	19	-1	-21	...	...
14	12.5	24	9.5	15	-9	-33	...	...
15	11.9	24	9.0	11	-16	...	...	...
16	11.5	24	8.8	8	-20	...	...	...
17	11.2	24	8.5	6	-24	...	...	...
18	11.0	24	8.4	4	-26	...	...	...
19	10.1	25	7.8	-3	-39	...	...	...
20	9.1	25	7.0	-16	...	...	...	...
21	9.0	26	7.0	-17	...	...	...	...
22	11.5	17	8.6	5	-19	...	...	...
23	16.2	10	12.6	13	6	-3	-18	-36
24	20.7	9	15.9	10	12	9	1	-9

VK EAST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.4	21	16.9	26	26	23	16	7
2	22.3	21	16.8	26	26	23	16	7
3	22.0	22	16.6	28	27	23	16	6
4	21.5	23	16.3	30	28	24	15	5
5	20.4	25	15.5	34	30	23	13	2
6	18.7	30	14.2	40	32	23	10	-4
7	16.8	32	12.7	40	28	17	2	-14
8	14.9	35	11.2	37	22	9	-9	-28
9	13.0	37	9.8	32	14	-1	-22	...
10	11.6	39	8.7	27	6	-11	-36	...
11	10.6	40	8.0	23	0	-20	...	...
12	10.0	41	7.5	19	-4	-27	...	...
13	9.7	41	7.4	17	-7	-31	...	...
14	9.5	42	7.1	16	-9	-33	...	...
15	9.3	42	7.1	15	-11	-35	...	...
16	8.4	43	6.5	9	-19	...	...	...
17	7.8	44	6.0	3	-30	...	...	...
18	7.8	44	6.0	3	-30	...	...	...
19	9.9	38	7.4	17	-6	-28	...	...
20	13.9	29	10.8	28	15	2	-15	-35
21	17.9	25	13.8	29	24	16	4	-9
22	20.4	23	15.7	28	26	21	12	1
23	21.5	22	16.4	27	26	22	14	4
24	22.2	21	16.8	26	26	23	15	6

VK STH - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	25.0	12	18.9	20	22	19	13	4
2	25.6	13	19.1	21	23	20	14	6
3	25.5	13	19.1	22	24	21	14	6
4	24.7	14	18.7	25	25	21	14	5
5	23.0	16	17.4	29	26	21	11	1
6	20.8	21	15.7	37	28	19	7	-6
7	18.7	23	14.2	36	25	14	0	-17
8	16.7	25	12.6	34	20	7	-11	-31
9	14.4	28	10.8	29	11	-5	-28	...
10	12.6	30	9.4	23	1	-19	...	...
11	11.4	31	8.5	17	-7	-31	...	...
12	10.4	33	7.7	10	-18	...	...	...
13	9.8	33	7.2	6	-25	...	...	...
14	9.6	33	7.1	5	-27	...	...	...
15	9.7	33	7.2	5	-26	...	...	...
16	9.3	34	7.2	4	-28	...	...	...
17	8.8	35	6.8	0	-36	...	...	...
18	8.5	35	6.5	-5	...	...	...	...
19	8.7	31	6.7	-3	-38	...	...	...
20	10.7	23	8.4	9	-14	-37	...	...
21	14.6	18	11.3	18	7	-6	-25	...
22	18.9	15	14.5	20	16	9	-2	-17
23	22.1	13	16.9	20	20	15	7	-3
24	24.0	13	18.1	20	21	18	11	2

VK WEST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	24.1	8	18.3	6	12	11	7	0
2	25.2	8	19.0	6	13	12	8	2
3	25.6	8	19.4	7	14	13	10	3
4	24.7	9	18.7	9	15	14	9	2
5	23.2	11	17.6	14	17	14	8	0
6	21.1	14	15.9	21	19	14	5	-6
7	19.1	18	14.5	27	21	12	0	-13
8	17.2	23	13.0	31	20	9	-7	-24
9	15.6	25	11.8	30	16	3	-15	-35
10	13.9	27	10.4	26	9	-6	-28	...
11	12.0	30	9.0	21	0	-19	...	...
12	10.9	32	8.1	16	-7	-30	...	...
13	10.2	33	7.6	12	-13	-37	...	...
14	9.8	33	7.3	10	-17	...	...	...
15	9.7	33	7.3	9	-18	...	...	...
16	9.5	34	7.3	8	-19	...	...	...
17	9.3	34	7.2	7	-21	...	...	...
18	8.8	35	6.7	3	-28	...	...	...
19	8.6	31	6.6	1	-30	...	...	...
20	8.8	21	6.8	1	-25	...	...	...
21	10.9	14	8.0	8	-8	-25	...	...
22	14.8	11	11.4	12	6	-4	-19	-37
23	19.1	10	14.7	11	11	6	-2	-14
24	22.3	9	17.0	8	12	10	4	-4

VK EAST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.8	5	21.8	-23	-3	3	5	4
2	25.5	8	20.5	-12	3	8	8	6
3	24.1	11	19.4	1	11	13	11	6
4	22.9	16	18.3	15	19	17	13	6
5	22.3	20	17.7	27	26	22	15	7
6	21.8	24	17.2	36	31	25	16	7
7	21.0	23	16.7	37	30	23	13	2
8	19.9	22	15.0	36	27	18	6	-6
9	17.6	24	13.3	34	23	12	2	-18
10	15.9	25	12.0	31	18	5	-11	-29
11	14.7	26	11.1	28	14	0	-18	-39
12	13.9	27	10.4	26	10	-4	-24	...
13	13.4	25	10.1	22	7	-8	-28	...
14	12.8	18	9.6	15	3	-10	-30	...
15	12.5	11	9.4	9	0	-11	-29	...
16	11.4	0	8.7	3	-4	-15	-32	...
17	10.1	-13	7.7	-1	-7	-18	-35	...
18	9.9	-21	7.7	-3	-6	-15	-30	...
19	12.8	-13	9.5	-8	-4	-7	-16	-29
20	18.3	-4	14.1	-17	-4	-2	-5	-11
21	23.4	0	18.0	-27	-7	-1	0	-2
22	26.4	1	20.2	-32	-9	-1	1	0
23	27.3	2	20.8	-32	-9	-1	2	1
24	27.5	3	21.1	-30	-7	0	3	3

VK STH - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.4	6	22.4	-21	-1	5	7	6
2	27.1	9	21.5	-8	6	10	11	8
3	25.7	14	20.6	6	15	16	15	11
4	24.4	18	19.5	20	23	21	17	11
5	24.0	20	19.0	30	28	25	18	11
6	23.5	19	17.6	36	30	24	16	6
7	20.6	21	15.4	35	27	19	9	-3
8	17.6	24	13.1	33	22	12	-2	-18
9	14.9	26	11.1	29	14	1	-17	-37
10	12.9	28	9.5	23	5	-11	-34	...
11	11.6	29	8.5	18	-2	-22	...	...
12	10.9	30	8.0	15	-7	-29	...	...
13	10.7	26	8.0	12	-8	-29	...	...
14	10.7	17	8.0	9	-7	-25	...	...
15	10.7	7	8.0	5	-7	-21	...	...
16	10.1	-4	7.7	1	-8	-20	...	...
17	9.5	-15	7.2	-1	-8	-20	-38	...
18	9.7	-21	7.5	-2	-6	-15	-30	...
19	12.0	-15	8.8	-6	-3	-8	-18	-32
20	16.4	-6	12.7	-14	-3	-3	-7	-15
21	21.3	0	16.3	-22	-5	0	-1	-5
22	25.0	1	19.1	-29	-8	-1	1	0
23	27.1	3	20.5	-30	-8	0	3	2
24	28.3	4	21.3	-28	-6	1	4	4

VK WEST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.8	4	20.8	-33	-9	0	4	4
2	25.5	7	20.5	-25	-4	3	6	6
3	24.1	9	19.4	-13	3	8	9	6
4	22.9	12	18.3	-2	9	12	10	6
5	22.3	16	17.7	10	16	16	13	7
6	21.7	20	17.2	22	23	21	15	8
7	21.0	23	17.0	30	28	23	16	7
8	20.0	27	15.6	36	30	24	15	5
9	19.1	27	14.8	37	29	21	11	-1
10	17.4	26	13.1	35	24	14	0	-15
11	14.8	29	11.1	31	17	4	-14	-34
12	12.7	31	9.5	25	8	-8	-30	...
13	11.4	29	8.5	19	1	-17	...	...
14	10.8	20	8.0	13	-3	-20	...	...
15	10.7	11	8.0	9	-3	-17	-39	...
16	10.8	1	8.1	5	-2	-13	-31	...
17	10.9	-5	8.2	2	-1	-10	-26	...
18	10.3	-15	7.8	0	-2	-10	-24	...
19	9.6	-31	7.3	-5	-6	-13	-27	...
20	9.8	...	7.6	-15	-13	-19	-32	...
21	12.3	-19	9.1	-9	-1	-3	-10	-20
22	17.0	-7	13.1	-20	-5	-1	-3	-9
23	22.0	-1	16.9	-31	-9	-2	0	-2
24	25.6	2	19.6	-35	-10	-2	2	1

VK EAST - USA/CARRIBBEAN

VK STH - USA/CARRIBBEAN

VK WEST - USA/CARRIBBEAN

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FOR SALE - NSW

● KENWOOD HF station, base/mobile including TS-130S, DFC-230, PS-30, AT-180, MC-50, MC-42, mobile mount & cables, service Manuals, packing. $1250 the lot. Ph: (066) 526135 VK2AWA.

● YAESU FT690R all mode 6m Tx/rec with operator's manual and original carton. Bill VK2NZ. Ph: (043) 23 1286 QTHR.

● HYGAIN Explorer, 14, 4-elemem trlbander, new, $900. FL2100B linear, $650; FV107, $75. Jim VK2AKJ QTHR. Ph: (02) 427 1398.

● ICOM IC730A HF txvr, very little use, $695; Icom IC25-A VHF txvr, GC, $250 ono. VK2KHF Don. Ph: (068) 48 3575.

● WERNER WULF 3el 20m beam and Kenpro 2000RC rotator, both in VGC. Will accept any reas offer. David VK2BZM. (02) 498 2259.

● ESTATE VK2IS TS93OS, VGC with service manual, $1900; Shinwa LPF, $40; Daiwa CNG20, SWR meter, $75; DigiMax frequency counter, $120; Advance signal generator 7.5-250MHz, $100; Philips CRO, $75; Micronta DMM, $75; DL6WV 70cm long yagi, $130; KenPro KR400 rotator, $250; EA digital frequency counter U/S, $50. DSE Explorer 2m unfinished, $75; VPS home brew, $40; assorted CO-AX RG8RG58, $50; hundreds valves, $100; hundreds EA AR, $50; various old test gear and parts. Robert Brinkman QTHR VK2IS. (066) 52 3376.

● OSCILLOSCOPE Telequipment D43R dual-beam 25MHz, rack mount, with A, C2 and G plug-ins, plus manuals, VGC, $300 ono. Tektronix plug-ins, type B, CA and LA, from $75. VK2KLH QTHR Brian. (02) 545 2650.

● ALINCO DR-590T 2m 70cm FM mobile 45w/35w full-duplex DTMF mic dual receive, the lot still under warranty, manual, $750. Steve VK2ASG. (02) 565 9730 (BH) or (043) 24 1542 (AH).

● BRAND NEW Sangean World Range Receiver. Full freq range 150K to 29999K and Fm 87 to 108M. tuning direct entry ditigal manual scan with memory storage. Tunable BFO. Clock for auto operation. Morse keys, Bendix and one ex-disposals ex-army type. Alfred VK2AXR. (02) 477 6275 QTHR.

● YAESU FT-736 VHF/UHF with factory fitted 6m, 2m & 70cm modules, also includes MD-1 desk mike and two TOKYO HY-power linear amps, one for 2m HL-62v, 60w) and 6m (HL-66V, 60w) still in boxes, bought at Gosford one month ago with two-year warranty and receipts, $2950. No shipping. Bert VK2BTW, PO Box 573, Bowral 2576. Serial No 9G290504. Ph (048) 61 2092.

● YAESU FT4700RH dual band 70cm/2m transceiver. Ideal for car or base station. All extras included, 5 and 50w output, detachable front panel, 20 memories per band, ARS, CTCSS, tone encode/decode, full duplex crossband, extended frequency response 140-174MHz, DTMF microphone autodialler (Ideal for phone patch). Almost new. Great buy at $890. YAESU FT470 mobile dual band 70cm/2m transceiver, 21 memories, CTCSS tones encode/decode, DTMF autodialler, full duplex crossband operation, ARS, scanning and priority monitoring, extra battery. Almost new. Great unit at $695. VK2XTO QTHR. (02) 690 9435.

● KW2000E 1.8-30MHz, GC, RF speech proc $250. 72CH 10mx T/R Courier GC, $200 ono. Frequency counter $110. R1155, EC. WW2 $100. System 80 computer monitor, plenty games, $50. Hi and Lo band AWA-FM car phones. Offer. VK2AJY. (043) 96 4553.

● VIKING 352D CB converted to 10m 24 channel USB LSB AM plus 5kHz per channel TRX clarify $100. Vintage Cossor CRO 1066, Mk3 distorted raster, $75. Delivered Melbourne. (050) 30 2464 or Box 89, Koraleigh 2735. Max VK2CMS.

FOR SALE – VIC

● DECEASED ESTATE VK3DKO. Offers are invited for the following equipment. Much of the equipment is as new and in original packing. Kenwood TR751A 144MHz all mode transceiver; Kenwood PS430 DC power supply; Kenwood AT250 antenna tuner; Daiwa LA2155 144MHz linear amplifier; Yaesu FC757-AT full automatic antenna tuner; Yaesu FT-757GX transceiver; Kenwood TS-430S transceiver; MFT MFJ-989C antenna tuner 3kW series, roller inductor; Yaesu FL2100Z linear amplifier; Yaesu FL2100 linear amplifier; Heathkit SB610 monitor scope; Kenwood TM-221A 144MHz transceiver; 1 pair 572B valves; 20amp DC supply; Kenwood SP430 speaker; ATN 13-30-9 log periodic antenna in original carton (new — never used); Create rotator RC5A (with bearing and stainless steel hardware) (new — never used); Archer automatic servo rotor, cat no 15-1220 c/w cable; Kenpro antenna rotor KR-250 C/W cable; Daiwa CN550 dual needle SWR meter. Contact Les Burr (03) 417 7566 or Box 1548 Collingwood , Vic 3066.

● COLLINS power supply 426U-2, 90 to 140 vac, 45 to 450 Hz, 1PH to 3PH or DC, to 27.5V DC 100A. Circuit. Macchi inverter 28VDC to 115/200 VAC 400Hz, 3PH/1PH, 750/750VA. $200. David VK3BFB. (03) 587 1593.

● COMMODORE 128 s/n 4498776. 5¼ floppy disk drive, s/n 1003710. MPS 1250 printer s/n XU5001170 W/speed accelerator cartridge.Fax, RTTY & CW listening kit RS232 in/out. 70 disks, games, office, ham radio, plus all manuals and guide for programmers, $900. (054) 60 4048.

● YAESU YM48 mic with tone encoder and scan, $65; Yaesu 50-54MHz module for FT726R, $325. Palomar FL4 audio filter, $45. Roger VK3XRS. (051) 56 8291.

● KENWOOD TS820S with external VFO MC50 microphone, Seiko SC7000 scanner, EC, still in box. UHF handheld Nicad battery and charger. (051) 99 2811.

● VALVES 6146, $12; 6146B, $12; QQ EO3/12 $8; 2C39BA, $16; 33 $12; 5763 $5; 6BLB, 6AU6, 6C4, 6ES8, 6U9, $4 ea. Diecast box 185 x 120 x 80, $25. Some butterfly capacitors. Roger VK3XRS. (051) 56 8291.

● TELEREADER CWR 685E CW RTTY Baudot ASKII Built-in green phosphor 5-inch CRT Amptor, converter, keyboard 4amp 13.8V power supply. All instructions, $650. S/N 521109. (051) 57 0236.

● TENTEC DELTA 580 HF Txvr 100 watts output EC with desk mic and manuals, $695. Rob VK3JE. (03) 584 4737 or (060) 37 1262 (free freight).

● LINEAR AMP 100w on six DSE kit assembled, VGC, $250. Five-element delta loop for 6m on 4.5m boom. Offers? VK3FMD Martin. (03) 580 6500 (w), (03) 583 7062 (h).

● MAST H/duty, 6' galv sections ex-Army 16 @ $25. Will haggle for lot. Fairchild Portascope 20MHz dual trace CRO with manual, $150. Barrie VK3KAY QTHR. (058) 21 5756.

● NALLY TOWER 17m, free standing, wind up, tilt over, no rust C/W Hygain THE-DXX beam and Emotator 502CXX heavy duty rotator, all PC. Replacement cost $2800, sell $1500. Ken VK3MW. (03) 560 5278. QTHR.

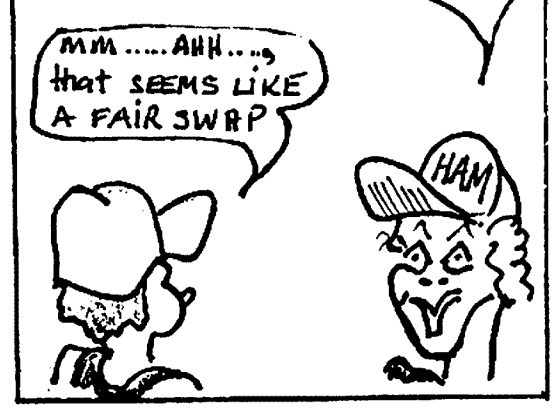
● BARGAIN PRICES for new and used parts. Panel meters, MR2P 0-50UA, 0-50MA, 0-250MA etc, $10 ea. 3 gang variable 450uuf sec $13 ea. Primo PTT dyamic HH mics, $10. 250/110v trans 2.17 amp, $17.50. TX valves 2 x 813, 2 x 828, 2 x 837, 2 x 6146, 2 x 832, 4E27, 815, 829B and 807s, new & used. Offers. Many sockets avail to suit RX valves $2 & $3 ea. Octal, Noval Bases. Let me know your needs. Split stator & assor Tx & Rx variable caps. From $2. Don VK3ADI. (03) 882 0020 BH, (03) 859 5593 AH.

● MALDOL HS-260 twin meter SWR and power meter measurable power 0-12W 0-120W frequency 3.5-150MHz. Chris QTHR VK3CXP. (03) 328 4849 BH, AH 366 5060. $80 ono.

● BATTERIES 12 2v 200amp hour Chloride lead acid cells, $50 ea or 6 for $2. 4 x 6volt 90amp hour, Chloride lead acid cells, $100 each or 2 for $160. 4 x 12 volt, 50amp hour Powersonic gell cells, $120 ea or 2 for $200 2 x 12volt 40amp hour Powersonic gell cell, $110. Evan VK3EJV. (03) 438 2878.

FOR SALE - OLD

● ICOM 750 (751) TXCVR $1350 ono, mint cond. Yaesu FL2100B linear fine tuned $750. VK4LC OTHR. (075) 45 2144.



Adrian Fell VK2DZF

● VALVES 572B T160L new, unused, suit linear amp, $350 the pair. Peter VK4APD QTHR. (07) 397 3751 AH.

● TEST equipment — new valves for vintage radios, also other types including transmitting. Limited quantity. Send SAE for list of your requirements. VK4DY QTHR.

● PARTS ex 10kW TV TX 6166 valves, 1ph 240V AC 25A V Reg. 3ph 19a 415V AC V reg. Large Cs 1/7500V, 2/5000V, 4/1500V, 8/1500V. Large 3ph power TFXs 2260v, 57A, 615V, 2.2 KVA, 8.4V 150A, 6KV, 22KVA. Lots more. VK4BJ. (07) 378 4483.

● PATON valve multi-tester old, what offers? Yaesu FT7 txcv $400. Don VK4NWW. (07) 888 4052 QTHR.

● TRIBAND HF beam antenna with BN86 balun, VGO $250 ono. QTHR VK4GB. (070 396 1836.

FOR SALE - STH AUST

● FT101ZD WARC bands SN 240632 spare 6146s hand desk mics FL2100Z SN 160061, both top order. Sell as pair. $1750 ono. Murray VK5BVJ. (087) 38 0000 QTHR.

FOR SALE – TAS

● KENWOOD TM231A 2m FM mobile 50w high 10w low receives 136-173MHz. As new, $500. Kenwood DRV1 digital recording unit, new, $165, suits TM231A 731A 431A 241A boxes, manuals etc. Yaesu FT707 service manual. $25 (003) 27 2332 VK7AN QTHR.

FOR SALE WA

● QUAD BEAM HF antenna made by Hi-Gain USA. Single 50 Ohm feed two element 3 band SWR 1/1.2 on 40ft tower winding down 20ft. $200 ono. Moving QTHR Tom Long. (09) 386 7692.

● BRAND NEW Complete unused full copy of Supercak 5. This is an unwanted prize but a powerful spreadsheet package for the IBM PCs. Of no use to me due to wrong sort of computer. Will swap for something or $300 ono. QTHR VK6FKB. (09) 581 6303.

● FTI TRANSCEIVER $1500 FT726R TX fitted 2m 70cm plus satellite modles, $1200. 2-813 valves, $30 ea. 3-813 bases, $10 ea. 2-12v 100va power supplies stabilised, $60 ea. 1 microwave modules converter, $70. All mint. VK6TP QTHR. (09) 299 6741.

WANTED NSW

● MINI BEAM 20m or tribander to suit pair 3-500Z VK2AX. (02) 969 6570, PO Box 489, Spit Junction 2688.

● AUSTRALIAN Official Radio Service Manuals, vols 1, 2, 4 (1937-1941) published by The Strand Press Pty Ltd. Also need circuit details or any information re Wagner Model A531 broadcast and shortwave receiver. VK2VJD John QTHR. (047) 51 3066.

● YAESU FT101ZD MKIII prefer CW liller must be in GC. (02) 899 1553 or write PO Box 344 Baulkham Hills 2153. Adrian VK2DZF.

● HISTORIC Reconstruction Project lifetime ambition. Require PRE1930 Xmitting bottle, Eg UV202 UV203 UV204 UX210. Mullard 0/20 0/30 0/40 etc. Any interesting item for project welcome. Please ring reverse charges for a chat. Dave Bird QTHR. (02) 450 2611 AH VK2TNX.

● NON-INDUCTIVE resistors, 30w plus. 25, 35, 50, 75 Ohm or thereabouts. VAC relay. Ron. (02) 918 3835.

● 70cm RX IC402, IC215, working or not, buy or exchange. VK2AJY. (043) 96 4553.

● AZIMUTH rotator indicator, made by Iwasaki Inco Ltd or circuit diag of same. (02) 416 1381.

● URGENTLY. Photocopy of the circuit diagram KYOKUTO FM144-10SXRII 2m FM transceiver. Please help. Greg Neuwenhuis VK2YBD, PO Box 101 Douglas Park 2569.

WANTED – VIC

● COPY OF operating manual or similar information for Q-Craft power/SWR meter model SWR-2. All costs reimbursed. Roy VK3XY QTHR. (03) 557 1265.

● MOBILE HF txcvr, small size FT7 FT730 or similar. Stewart VK3NV QTHR. (059) 873592.

● YAESU YO901 monitor scope for FT901 series Ixcvr. Also 2m convertor. VK3APA QTHR. (058) 64 6287.

● AWA TYPE "D" plug-in crystals for car phones Rx=(Sig freq (Mhz)–2)/14. Transmit Xtal = 36 times crystal frequency. 30 pF cap sets required for Victorian 2m voice repeaters. Vincent VK3AJO. (03) 872 3503, (03) 657 3385 B/H.

● COLLINS KWM2 or KWM2A xcvr in EC. Rob VK3JE. (03) 584 5737.

● ELECTRICAL & TELEPHONE equipment, cable, tools, hardware and access C64 computer, drills, electrical testers, batteries and heaps of good bargains. Approx $12,000 worth of goods must be sold. For inventory copy please phone Evan VK3EJV. (03) 438 2878 AH.

WANTED QLD

● COPY instruction manual Tono 7000 (not 7000E) any other data. Pay all costs. Bob VK4FPO QTHR. (079) 27 1442.

● REQUIRE 7700kHz crystal, Aldis Lamp bulbs 12v 36w and any information on WWII Aldis signalling lamp, USA army hand generator GN45B 6/500 volts, navy B41 receiver. VK4EF. 97 Jubilee Tce, Bardon 4065. (07) 366 1803.

● TH328 TH308 YD1333 and 7650 YL1110 transmitter tubes. VK4TL John. (070) 54 3677.

● YAESU FRG 7700 or Kenwood R1000 in good working condition. (074) 47 1357.

WANTED – STH AUST

● BASE CONNECTION and electrical data for Philips DG7-5 and DG7-31 cathode ray tubes. Information re oscilloscope textbooks welcome. K-Postler VK5KI QTHR. (08) 264 1902.

WANTED WA

● 70cm or 23cm HT or mobile. Homebrew equip OK. Also 2m or 70cm Yagis and ATV equip, homebrew OK. VK6KDS Dave QTHR.

● INTRUDER WATCH observer in VK6. Free tape, logs, postage and advice. Please help. Contact Graham VK6RO QTHR. (09) 451 3561.

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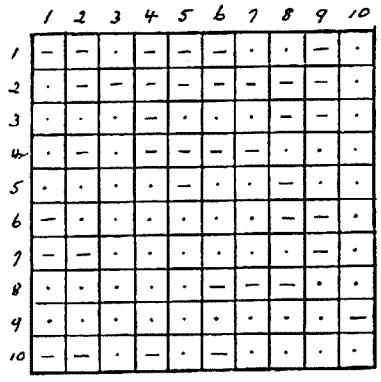

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
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MARKETING
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Norm Eyres VK3ZEP

ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
(03) 523 8191
Fax: (03) 523 8191
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Cover

Members of RAAF Williams ARC communicating with STS-37 space shuttle "Atlantis". Pictured LtoR are AC Barry McCormick (Radio Tech adult Trainee), App Adam Gardiner (Radio Trade Apprentice — son of VK3KSF), AC Michael Oliver (communications Op Trainee), FSgt Peter Ormerod (Radio Tech Ground) VK3CPO, App Nigel Gilchrist (Radio Trade Apprentice). See full story on page 22 Photo Crown Copyright used with permission.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Why Be An Amateur?

Writing in the May issue of *Break-In*, Arthur Godfrey ZL1HV asks *"Whither amateur radio? Or should it be Wither?"* Further on, he asks, *"Has the magic gone?"* and continues, *"I think it has. After the age of 10 there is no longer any mystery or excitement about radio communication. From about the age of three the present generation grows up in a world of satellite TV, cellphone systems, cordless telephones, home computers; and, in many cases, is able to use these devices. What fascinated us is now "ho hum". CB provides what many want in the way of communication, and there is little incentive to progress further."*

The scene in Australia is not much different. We have an amateur population of less than 20,000 and a CB population at least 20 times as great. Why is CB more attractive than amateur radio? I can think of a few reasons:

1. There is no need to pass exams
2. The equipment is relatively cheap
3. There's no problem finding someone to talk to, at least in cities and large towns
4. CB can be used for business purposes.

Arthur says there is little incentive to progress further. As amateurs already, we know there is a great deal of incentive, but to do any good it has to be known by the CBer, or shown by us. What arguments do we have with the claims listed above?

1. Is there any worthwhile activity, involving many people, which doesn't need passing exams? To drive a car, fly an aeroplane, get almost any decent job. If anyone can do it, with no exam, it's no big deal!
2. Commercial equipment is cheaper, yes. You can't use anything else on CB. But, as a licensed amateur, you can build your own, or update something older and cheaper, because to achieve that licence you learned something about the technicalities of radio. Enough groundwork, at least, to start learning more!
3. This is seldom a problem for amateurs, either! And if and when you progress to HF or satellites, then the world's your oyster!
4. True. Amateur means what it says; no money-making purpose to the communication. But this is why the whole world accepts amateur radio, simply because it's non-commercial, non-political, friendly conversation.

There are many other ways in which amateur radio gives you more. Bands right through the spectrum, MF to microwaves, not just one or two bands, different in every country. You can work DX legally, almost round the clock, year after year, sunspots or not! You could be in a net with stations from half-a-dozen countries together. Or you can just chat to your mate for hours without one breaker!

Need I say more? Do you know any keen CBers? Show them this magazine. Amateurs and CBers don't have to mix like oil and water! With a little more tolerance we might even get to understand each other!

ar

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

Registered Executive Office of the WIA: 3/105 Hawthorn Road, Caulfield North, Vic, 3161

All mail to: **PO Box 300, Caulfield South, Vic, 3162** Telephone: (03) 528 5962 (03) 523 8191

Fax: (03) 523 8191 (Non-dedicated line)

Business Hours: 9.30 am to 3.00 pm on Weekdays

General Manager and Secretary: Bill Roper VK3ARZ

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

International Representation Fund

In the past the WIA has funded international activities on an ad-hoc basis, facing each new demand as it arose. For WARC79 this posed a problem and some amateurs may remember the intensive fundraising actions which took place at that time. At the 1989 Federal Convention of the WIA, the Federal Council saw the need for more responsible financial planning and set up a more formal approach to international commitments.

The WIA has always had a responsibility to pay annual dues to the International Amateur Radio Union (IARU) Region 3 Association. This has been set at 75 cents per licensed member of the WIA for the current triennium and is an identified component of the Federal membership subscription.

Triggered by the desire to have amateur representation on the Australian WARC 92 delegation, and the need to fund that representation, Federal Council decided to gather together all other international funding commitments into a new component of the Federal subscription.

In addition to funding travel during the preparations for WARC 92 involvement which, incidentally, started back in February 1990, the fund will pay for the WIA delegation to each IARU Region 3 conference (normally held somewhere in South East Asia every three years), one or more Australian amateurs on the Australian national delegation to WARC 92 in Spain in 1992, WIA attendance at the NZART annual conference every other year and NZART accommodation at our Convention in the intervening years, as well as other international representational activities as they arise.

The WIA is not required, however, to finance the activities of the Australian director of the Region 3 Association, for this is paid for by the Region.

Federal Council set the international representation component at $2.00 per full member, and $1.60 per conces-

Stop Press

DoTC announces new ruling on Third Party Traffic definition.

"Message originated by an amateur and passed to another amateur by a third amateur, whether within Australia or overseas, is no longer considered to be Third Party Traffic."

Full details in next month's *Amateur Radio* magazine.

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570 MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Tim Mills David Horsfall Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2ZTM VK2KFU	(R Denotes repeater) Times 1045 and 1915 on Sunday 1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0900-1600 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Old 4001 Phone (07) 284 9075	President Secretary Treasurer	Murray Kelly Eddie Fisher Eric Fittock	VK4AOK VK4ABX VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Faman Bruce Hedland - Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfame TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00

VK8 (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

sional member, to commence as from January 1989. The amount was arrived at by predicting all likely international expenditure for future years and determining an average figure which would make adequate provision to meet those expected outlays as they arose.

By setting the starting date at January 1989, but allowing that current year's payment to be deferred until the end of 1990, Council aimed to provide an initial balance in the fund to meet the outlays which commenced mid 1990 and to augment the fund nearer the higher outlay dates in 1991/92. In making these decisions Federal Councillors were also aware some Divisions had already been making financial provisions for WARC 92 and saw this approach as a way of dedicating those funds nationally.

To give a feel for the sums involved, the WIA estimates that sending one amateur to Spain for thirty days, accommodating and feeding him in the same hotel as the other members of the Australian delegation, providing a modest sum for incidentals and showing the amateur radio and WIA flag, will cost about $11,000. You will notice nowhere do we mention recouping lost earnings for the WIA representative whilst away from home. The duty is one of love, which may be able to be done on long service leave.

Since that Federal Council decision in 1989, the WIA has acted to include an amateur in the Australian national delegation to the Joint Interim Working Party (JIWP), held in Geneva for two weeks in March 1991. This action was estimated to cost over $6000. That decision was made because of the perceived importance of the JIWP, which sets the technical input to the WARC, and was made at the possible expense of only sending one amateur to WARC 92 itself.

The cost of sending a delegation of four to the IARU Region 3 conference in Indonesia during October this year will be around $9000. Why four you might ask? Well this is very likely the last conference for the WIA team leader and the opportunity is right to expose three new delegates in the international sphere. This chance could not be afforded in 1988, for the WIA did not have financial planning of this nature in place at that time.

The WIA sends two representatives to the NZART conference on alternate years and NZART send two to our Federal Convention in the intervening years. An agreement between associations provides for the host to fund accommodation so the visitor's society need only pay for travel and incidentals. Our representation in New Zealand in June 1991 is estimated at $1600.

You might ask, is the WIA observing due economies with your funds and are the provisions adequate? To the first, Executive believes so; early purchase economy air travel is used wherever possible, entertainment expenses are kept modest and accommodation is usually arranged at group rates by the host society.

Is the present provision adequate? Executive believes so. The state of the fund is reviewed quarterly and Executive continues to manage international representation within current limits. Even so, after WARC 92 the scheme will be carefully reviewed in the light of future commitments.

DoTC Thanks WIA WARC 92 Team Leader

As previously publicised, David Wardlaw VK3ADW is the WIA WARC 92 team leader, and has attended numerous meetings with the Australian Preparatory Group for WARC 92, as well as attending the JIWP in Geneva in March this year.

An acknowledgment of the valuable work being performed by David, not only on behalf of the Australian amateur radio service, but also as a member of the government team to represent Australia at WARC 92, is contained in a letter received from Mr. D. Hartley, the Acting Assistant Secretary of the Transmission Policy and Spectrum Planning Branch of DoTC.

Dear David,

Thank you for your work in the Delegation to the JIWP and in particular for your assistance in co-ordinating the work on the Spectrum below 1 GHz. The CCIR report and all the associated discussion in Geneva will certainly make a valuable contribution to our further preparation for the WARC.

I look forward to your participation in the delegation to WARC 92.

Yours sincerely,
D. Hartley

As you can see, the WIA has respect and credibility with the Australian team for WARC 92, which will help in the fight to retain and gain frequencies for the amateur service.

1991 WIA Federal Convention

Twenty one delegates from the seven Divisions of the WIA and the Federal Executive worked very hard over the weekend of the 20th and 21st April 1991 at the 55th Annual Federal Convention of the WIA. Although much of the proceedings were routine, as is only to be expected at an annual general meeting of a company, a number of important decisions were made over the weekend, details of which will be publicised in coming months.

A highlight of the weekend was the address to the Convention by David Hunt, Manager Licensing, DoTC in Canberra. The WIA had become somewhat disenchanted over the past 12 months with the lack of response by DoTC to a number of outstanding concerns, a state of affairs which is now turning around as a result of high level representations to DoTC by the WIA in February this year.

As well as increasing the understanding of DoTC by the delegates in a frank address, David answered questions on a variety of subjects without hesitation. He also delivered written responses to the WIA on a number of matters.

Higher Speed Morse Exams

DoTC has advised that, for the purposes of obtaining an overseas amateur station licence, they will accept, through any State or District office, applications for examination in Morse Code at speeds higher than 10 words per minute. The fee for such examination is $25.00 and documentary evidence is provided to successful applicants.

Callsign Block IAA-IZZ Now Available

Appendix B ("Callsigns") in DOC72 ("Amateur Service - Operating Procedures") lists a number of callsign blocks which have not been allocated to any specific class of amateur. IAA-IZZ is one such block.

Although not allocated, callsigns have been issued from this block to various groups in the past to commemorate the various United Nations declared International Years. The allocation of such callsigns was limited to the IYA-IYZ series.

As many of you will already have heard on air, DoTC has now decided to formally allocate the IAA-IZZ callsign block for use by Unrestricted Amateur Stations. The exception will be the IYA-IYZ segment which will continue to be reserved for International Year commemorations.

Callsigns for Visiting Amateurs

The common practice in many overseas countries is for a visiting amateur, who is

issued with a visitor's licence, to be able to use his home station callsign prefixed by the suffix of the area in which he is operating, for example WB4/VK8XYZ.

Following representation, DoTC has agreed to permit visiting amateurs to utilise their home station callsign in association with their Australian allocated callsign during voice announcements, for example, VK8XYZ/WB4ABC.

DoTC advise that this concession is conditional on the visiting amateur using their Australian allocated callsigns first in all transmissions emanating from Australia.

Callsigns of Deceased Amateurs

Following the WIANEWS item in April 1991 issue of Amateur Radio magazine, DoTC has re-affirmed its agreement with the WIA to "reserve" a deceased amateurs callsign for a period of two years, with the proviso that the callsign will be re-allocated within that period if the written permission of the family concerned is available.

However, DoTC is concerned that a number of callsigns of deceased amateurs are being re-allocated within that two year period because DoTC does not know that the amateur holding the callsign is deceased.

In the normal course of events if an amateur station licence is not renewed at the annual renewal date the chances are that the callsign will be re-allocated within three months of the renewal date.

What is happening all too often in the case of deceased amateurs is that the family do not advise DoTC of the death, and ignore the licence renewal request when it arrives in the post. The result is a re-allocated callsign.

Hawaii Special Event Station

On 11th July 1991 the Big Island of Hawaii will experience a partial and total solar eclipse from 1630 to 1837Z. Members of the Big Island ARC will man NH6ES from 0001 to 2400Z on 11th July.

The station will be set up in the path of the eclipse at Puako, Hawaii. The NH6ES "Eclipse Station" will be operating in the Novice section of the 10 metre band, and in the general segments of the other HF bands. Special QSL cards will be available for those contacting NH6ES.

Italian QSL Bureau

A note from Mario Ambrosi I2MQP, the Secretary General of the Associazione Radioamatori Italiani (ARI), the WIA's sister society representing radio amateurs in Italy, advises that as from 1st April 1991 the **only** QSL Bureau for Italy will be as follows:

ARI - QSL Bureau
VIA D.Scarlatti 31
I 20124 Milano MI
Italy

Happy Birthday Sam

The 200th Birthday of Samuel Morse was celebrated by the establishment of two special event stations, VI91SM at the National Science and Technology Centre in Canberra and VI91AG Alice Springs, over a period of nine days concluding on Sunday 28th April. Naturally, most of the contacts made were in Morse Code.

As well as providing a unique QSL card for some 800 contacts with VI91SM and 500 contacts with VI91AG, the event attracted some very good publicity for amateur radio in the Canberra media.

VK0 QSL Addresses

For rather obvious reasons, the Australian addresses of those amateurs qualifying for a VK0 callsign are not made public. This has caused considerable difficulty for Neil Penfold, VK6NE, the WIA VK9/VK0 QSL bureau manager.

As a result of discussions with David Hunt, Manager Licensing of DoTC in Canberra, DoTC has agreed to assist the WIA in disseminating QSL cards for amateurs operating from Antarctica.

VK0 callsigns are only to be issued from the Hobart office of DoTC. Under the direction of Grant Millington in the Hobart office, all future applicants for a VK0 callsign will be asked to provide DoTC with a mailing address for the purpose of forwarding QSL cards for contacts made while operating in the deep south.

These addresses will then be supplied on a confidential basis to the WIA for the exclusive use of the VK9/VK0 QSL Bureau Manager.

Report on 33rd JOTA

Peter Hughes VK6HU, the Australian National Co-ordinator for JOTA, recently forwarded copies of the Australian Copy of the World Report on the 33rd JOTA to the WIA.

This comprehensive report notes that about 85 countries participated in the 1990 JOTA; and that over 10,000 amateurs provided over 5100 stations, at which a total of nearly 385,000 scouts, guides, and cubs, etc. had an intensely active few hours.

JOTA is clearly an international communication event of world standard, and receives publicity for the amateur radio service in a wide range of media.

Have you started your preparations to participate in the 1991 Jamboree of the Air which takes place over the weekend of 19th and 20th October 1991?

Praise for DoTC

DoTC generally collects more brickbats than bouquets from the general public, and from amateurs in particular, even though not all the complaints heard are justified. It seems to be so much easier in today's society to complain than to compliment.

The WIA is pleased to report the following experience by an American radio amateur on a recent visit to Adelaide as published in KEY KLIX, the newsletter of the Santa Barbara Amateur Radio Club.

"Taking Ruthie in hand I led the way to the offices of the Department of Transport and Communications, Currie Street, 11th Floor. Mr. Bob Baker greeted us at the counter and asked what we might want. A reciprocal licence for Ruth, I answered. No problem - all she had to do was present her US licence and fill out their equivalent of a 610 form. Having done so, Bob said to take the form and pay the cashier while he keyed the data into a computer terminal. Meanwhile, John Kerr, examinations officer came out and introduced himself and also provided us with copies of the VK regulations and information booklets.

Now in the US you'd expect red tape to start snarling up the works. Be prepared for a surprise. Mr. Baker looked up and asked "Do you have any preference for a call sign?" Before Ruthie fainted, I quickly suggested, "Anything with an RG in it would be fine." And in short order KA6SDN became VK5KRG. ... And when we got back to the motel there was a note to call Bob Baker. He'd managed to work the system to accept our Santa Barbara address and would be sending Ruth a corrected licence. Nice people!"

Amateur Radio Magazine Contributions

While articles, technical projects, letters or other items are always warmly welcomed by the editorial staff of Amateur Radio magazine, the thrill of receiving a new item is sometimes diminished by the

effort required to decipher it.

Of late, particular difficulty has been experienced with hand written faxes, which seem to lose a lot in the transmission. As copy must be read by typesetters and proofreaders, as well as the editors, it would be greatly appreciated if contributors made sure that the original articles are clear and legible.

Our volunteers do not have the time or resources to type articles for the typesetters. Diagrams also should be clear enough that they do not need to be interpreted before being redrawn. Less time spent on deciphering means lower production costs and earlier publication of your contribution.

Australian Standards

"The Australian Standard" for April 1991 notes, among many other items, that an updated standard has been prepared for fixed resistors in electronic equipment.

It also notes that standards have been set for the siting of radiocommunications facilities in relation to Fixed Location Satellite Earth Stations. This latter".. proposes recommended practices affecting the operation of the station, with potential interference to signals received or transmitted by the station and the potential impact that radiation emitted from the station could have on the adjacent community. It provides guidelines to organisations and individuals at any level concerned with approval, planning, construction, installation or maintenance of services to be provided at the station."

IARU Region III Conference

In a recent issue of Amateur Radio magazine, the WIANEWS column contained the agenda for the coming IARU Region III Conference, to be held in Bandung next October. The WIA has now identified a number of areas in that agenda where a WIA paper should be submitted. To have the maximum impact and chance of adoption, these papers need to be supplied well in advance of the Conference date. This allows their reproduction and distribution to member societies, including those who will not be represented in person at Bandung.

The WIA plans to contribute papers on the following:

* WARC92 preparations,
* Bandplans and band planning issues, including 14 MHz packet frequencies,
* Beacon frequencies and operations,
* DOTC spectrum management,
* Standards Aust, AUSTEL and RF tag devices,
* Satellite matters,
* Intruder watch, including problem intruders,
* Third party traffic update,
* QSL card standards and Bureau services in Aust,
* Packet radio status report including SYSOPS guidelines,
* Constitution changes to clarify the status of Association "President" and Treasurer,
* Guidance on a viable and achievable Association budget,
* Duration of tenure of office of Directors,
* The WIA will bid for the next Conference *to* be held in Australia in 1994.

We have received advance copies of some NZART papers and observe their views are almost diametrically opposed to ours on constitutional changes. Two of our WIA delegates will have a further opportunity to discuss Region III matters with the NZART during their visit to New Zealand in early June.

Do you have any matters which you believe should be aired in this IARU Region III amateur radio forum in October? If so please drop a line to the WIA's IARU liaison officer, Ron Henderson, VK1RH, through the Executive Office and he will research the issue and present it to Executive for inclusion in the WIA brief.

We anticipate the first batch of Conference papers will appear around August. Even though lead times may preclude their publication in full in Amateur Radio magazine, each one will be advised through Federal Tapes. This will allow members to hear what is to be discussed and send in their views, if they so wish, to guide the WIA delegation.

VK9 Callsign Suffixes

For many years, radio amateurs were able to identify the location of VK9 callsign stations by the first letter of the suffix. However, in recent years, due to a number of reasons, this practice was not observed by DoTC in issuing new VK9 callsigns.

As a result of recent WIA discussions with DoTC, David Hunt, Manager Licensing of DoTC in Canberra has now formalised a policy on the issue of VK9 callsigns for use by radio amateurs residing in or visiting the various Australian Territories, in accordance with the following convention.

Christmas Island	VK9X?
Cocos Island	VK9C?
Mellish Reef	VK9M?
Norfolk Island	VK9N?
Willis Island	VK9W?

Limited callsigns issued will consist of the above convention, but with a "Z" inserted between the "9" and the first letter of identifying suffix; similarly, Combined callsigns will have a "K" inserted between the "9" and the first letter of the identifying suffix, and the Novice callsigns will have an "N" inserted in the same place.

This will not be easy for DoTC because it means that all VK9 callsigns will have to be allocated manually, and not through their computer system. However, I am sure that the DX fraternity will be pleased to be able to easily identify the location of some of the rarer VK9 callsigns again. **ar**

Please Don't Do It!

As an active amateur on the bands you have probably accumulated many QSL cards. If ever you have a "clean-out" please don't throw these away. Best to contact the Hon Curator of the WIA Collection and he will visit you.

Maybe you would like to donate some of your own cards.

If in the country or interstate, contact Ken about card consignment (costs are refundable). If looking after a "silent key" estate, please make enquiries of the family whether they wish to donate any QSL cards.

All donations are acknowledged personally and also in *AR*. Let us save something for history!!

Ken Matchett VK3TL, Hon Curator, PO Box 1, Seville 3139
Ph: (059) 64 3721

Tragedy in India

Radio amateurs all over the world have been shocked by the assassination of Rajiv Gandhi VU2RG near Madras on 21 May. Our deepest sympathy goes to his widow Sonia VU2SON and family.

Fifty-Fifth Federal Convention

BILL RICE VK3ABP
EXECUTIVE EDITOR

A Little History

THE FIRST FEDERAL Convention of the WIA was held in Melbourne in 1924. Except for 1932, 1940-45, 1954-56, 1958 and 1961, Federal Conventions have been held every year since. The great majority have taken place in Melbourne, although all other capital cities (except Darwin) have hosted the convention at least once. The essential purpose has always been to provide a formal occasion on which all Divisions can discuss administrative matters of common interest. For this purpose each Division is represented by its Federal Councillor, but others may also be in attendance.

As explained last year, the annual convention is not now the only occasion on which all Divisions meet. In 1989 a new scheme was introduced whereby Federal Councillors became members of an Executive expanded from nine to 12 members plus the President. This full Executive now meets quarterly, the intervening monthly meetings being attended mostly (but not only) by members resident in or near Melbourne. Thus the April meeting no longer has a 12-month backlog of business to discuss but, as always, still serves as the Annual General Meeting.

This year on the weekend of 20 and 21 April the venue for the convention reverted to the Brighton Savoy Motel. Executive had no hesitation in deciding that the much higher standard of facilities at the Savoy provided better value for money than last year's venue.

People Present

In attendance from the Executive Office were Bill Roper VK3ARZ (General Manager/Secretary) and Brenda Edmonds VK3KT (Assistant Manager). Executive members (not being Federal Councillors) were Arthur Evans VK3VQ (Treasurer), Peter Gamble VK3YRP (President), Ron Henderson VK1RH (Vice Chairman), Kevin Olds VK1OK, Bill Rice VK3ABP (Executive Editor *AR*) and David Wardlaw VK3ADW (Immediate Past-President).

Federal Councillors (named first) and observers (where present) were:

VK1 Rob Apathy VK1KRA
VK2 Terry Ryeland VK2UX, Roger Harrison VK2ZTB, John Martin VK2EJM
VK3 Peter Maclellan VK3BWD, Barry Wilton VK3XV (Div Mgr)
VK4 David Jerome VK4YAN, Murray Kelly VK4AOK, David Jones VK4KLV
VK5 Bill Wardrop VK5AWM, Ian Watson VK5KIA
VK6 Neil Penfold VK6NE
VK7 Joe Gelston VK7JG

An apology was received from George Brzostowski VK1GB (until recently the VK1 Federal Councillor). George will, however, remain the Institute's honorary legal adviser. Resignations from Executive were also received from VK4YAN (replaced by VK4AOK) and VK3VQ (replaced on Executive, but not as Treasurer, by VK2ZTB).

Regarding the latter changes, Roger has been for some time the Federal Standards Co-ordinator (replacing Rob Milliken VK1KRM), but the position of Treasurer is once again vacant.

A number of other people were present from time to time during the convention. Notable was David Hunt (Manager Licensing Branch DoTC Canberra) who spoke and answered questions for over an hour on Saturday afternoon, covering a wide range of topics involving both the WIA and the Department.

Other visitors or office bearers present at least some of the time were (in alphabetical order of surname): Leigh Baker VK3TP (WICEN Co-ordinator), Bruce Bathols VK3UV (Past President), John Edmonds VK3AFU (Historian), Ron Fisher VK3OM (Fed Tapes Co-ord), Ken Hanby VK4IS, Harold Hepburn VK3AFQ (former Executive member), Jim Linton VK3PC (Div Pres), Ken Matchett VK3TL (QSL Collection), Ken Seddon VK3ACS (former Executive member).

Executive Discussion

Because of the new Council/Executive system, a good deal of the convention time was spent in "Executive mode", and in fact the alternative "Council mode" where only Divisions vote (with one vote each) only applied for about four hours altogether. Items dealt with included agreement that the WIA would be represented at the NZART convention (30 May-3 June 1991) by VK1RH and VK3KT, and that the Region 3 Conference at Bandung in October would be attended by VK1GB, VK1RH, VK2ZTB and possibly VK4AOK.

Subsequent to David Hunt's address, discussion thereon and correspondence received, a number of Executive resolutions were raised to follow-up more favourable DoTC attitudes on such matters as a new Call Book contract, examination protocol, repeater licensing, third-party traffic, reciprocal licensing with Argentina, Philippines, Holland, Greece, Thailand, Vanuatu and Italy, and changes to amateur licensing conditions.

Among the less routine items discussed by Executive prior to the address by David Hunt was the Call Book contract. One feature to emerge was that AGPS, DoTC and WIA policy does not permit the Call Book to be released in "any electronic form". This had resulted from a past attempt by an unnamed organisation to use a computer disk listing to generate a mailing list.

Also notable during this Executive session was a half-hour-plus account by David Wardlaw (our WARC-92 delegate) of his attendance at the Joint Interim Working Party of CCIR at Geneva in March. He suggested there were early indications of pressure on amateur bands at 7MHz, 50MHz, 420-450MHz and 2300-2450MHz. (See David's article on page 24)

By far the most controversial topic(s) to be discussed, both at Executive and Council level, were those which sought to reduce administrative distinctions between Divisions. Motions with this aim in 1990 had been either discarded or deferred. Later in 1990 there was a proposal that some form of non-Divisional membership should be available to federal employees and office-bearers, who could not otherwise work impartially for all Divisions. A model was proposed whereby the Divisions would amalgamate to form a national body (if approved by a majority of members). This was rescinded on the grounds that the model proposed was only one of a number of possibilities, all of which should be explored. A meeting was held at Albury in March, involving Federal, VK2 and VK3 representatives, which resulted in a proposal for a "Commonwealth Division" to which Federal officers and overseas members could belong. This was discussed for about an hour on Saturday afternoon, informally for several hours late on Saturday night, and then for a further half-hour on Sunday morning. The final decision was that a number of

possible models be developed, involving inputs from all Divisions, and presented to the July 1991 quarterly meeting.

Council Business

After almost all of Saturday was spent discussing matters involving the full Executive, it was not until after 4.30pm that the 55th Convention of the Federal Council was declared open. From then until dinner the main business was presentation and acceptance of the various annual reports. Seventeen of these were published in *AR* for last April, and another five were on hand at the convention. Nine were discussed before the last formal item of the day, which was presentation of the Remembrance Day trophy to Peter Maclellan representing VK3 Division, the 1990 winners. The remaining reports were dealt with on Sunday. Few raised any points of contention, although there was some discussion about the financial and the Publications Committee reports, while many contributed to debate on the points raised by the Contest Manager's report. The education report, particularly regarding examinations, also inspired a number of comments.

The remaining council agenda items were the election of Executive office bearers, which reinstated all except for the resignations and replacements listed earlier. A decision as to the 1992 Federal component of subscriptions was deferred until October, and a proposal to review and update policy statements was approved. The dates for the next convention were agreed to be 2-3 May 1992, and the Council segment of the convention closed at 1215 on Sunday.

Other Items

Reverting to "Executive mode" after lunch, the WICEN Co-ordinator, Leigh Baker VK3TP reviewed progress of WICEN to date, and some of the problems still apparent. Planning for WARC-92 was reviewed by David Wardlaw VK3ADW, who mentioned that he would be attending five preliminary meetings in the next two weeks! General business items include changes to the Crimes Act regarding scanners and radar detectors, choice of opening speaker for this year's RD Contest (VK2 undertook to negotiate) and arrangements for the July meeting. The proceedings finally closed just after 3pm.

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"Computarock" Receiving Converter

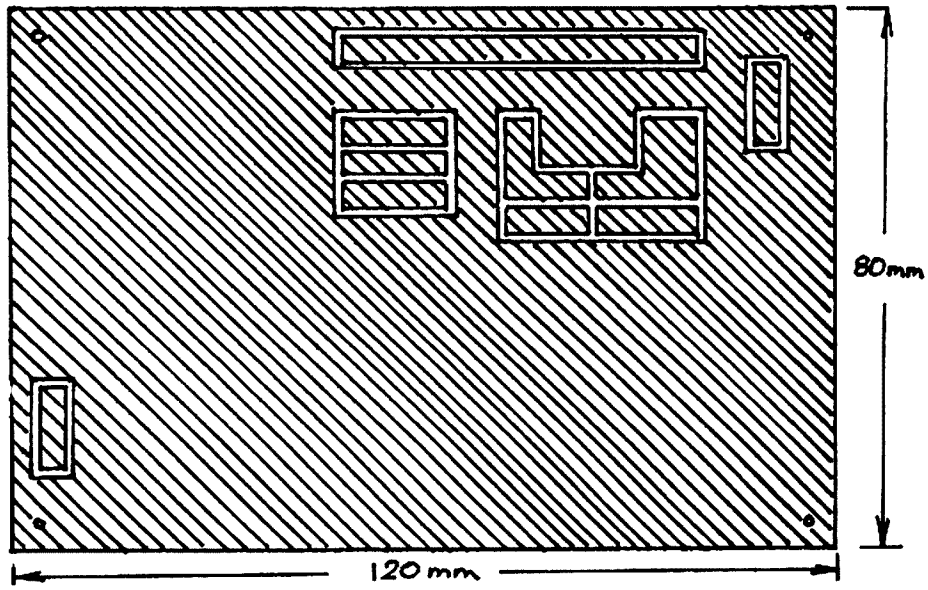
DREW DIAMOND VK3XU
'NAR MEIAN' GATTERS RD
WONGA PARK 3115

DO YOU HAVE A RECEIVER which tunes from 3.5 to 4MHz? Would you like to tune into signals on other bands? Here is a simple converter which will give adequate performance for HF bands from about 5MHz to 22MHz. No bandswitching is necessary, the operator simply selects an appropriate crystal and peaks the input band pass filter on the desired band. In most cases, two bands are accessible for each crystal. Standard "off the shelf" computer crystals may be used to gain access to several amateur bands and many interesting commercial bands (see table).

Circuit

Input signals are routed via a top coupled two-section bandpass filter, tuned by the two-gang variable capacitor C2-C3, and applied to gate 1 of the dual channel FET mixer (there are much better and "stronger" mixers than this. However, the dual gate FET mixer is arguably the best simple mixer available to the amateur. Some conversion gain is provided, very little noise is generated, and dynamic range is adequate for all but the most hostile receiving locations). Conversion gain is such that no additional RF amplification is necessary.

The selected conversion crystal Y is maintained in oscillation by Q2, and the heterodyning signal applied to gate 2 of the mixer. The wanted product will be either Y-f=4 (tuning backwards), or f-Y=3.5 (tuning forwards), eg to receive 7.0 to 7.5MHz, we would select an 11MHz crystal; 11-7=4, 11-7.5=3.5, and conversely, 14.5-11=3.5, 15-11=4 and so on. The drain of Q2 has a tank tuned broadly at about 3.7MHz to select these wanted products, link coupled to the 3.5-4.0MHz tunable IF.

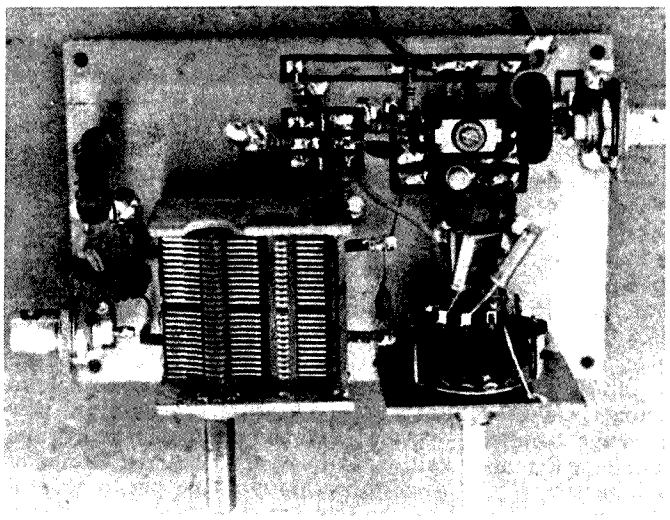


Board Layout

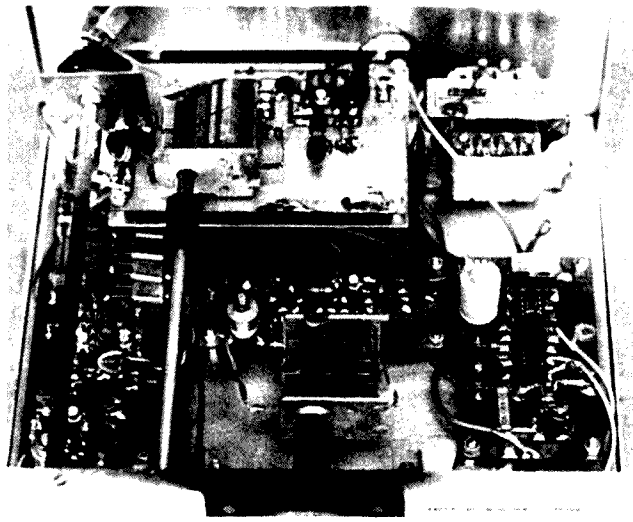
Construction

The circuit is uncritical of construction method, and just about any form will probably work if signal carrying conductors and by-pass leads are kept reasonably short. The prototype is wired upon a home-made etched printed board with the components soldered to the copper tracks as shown.

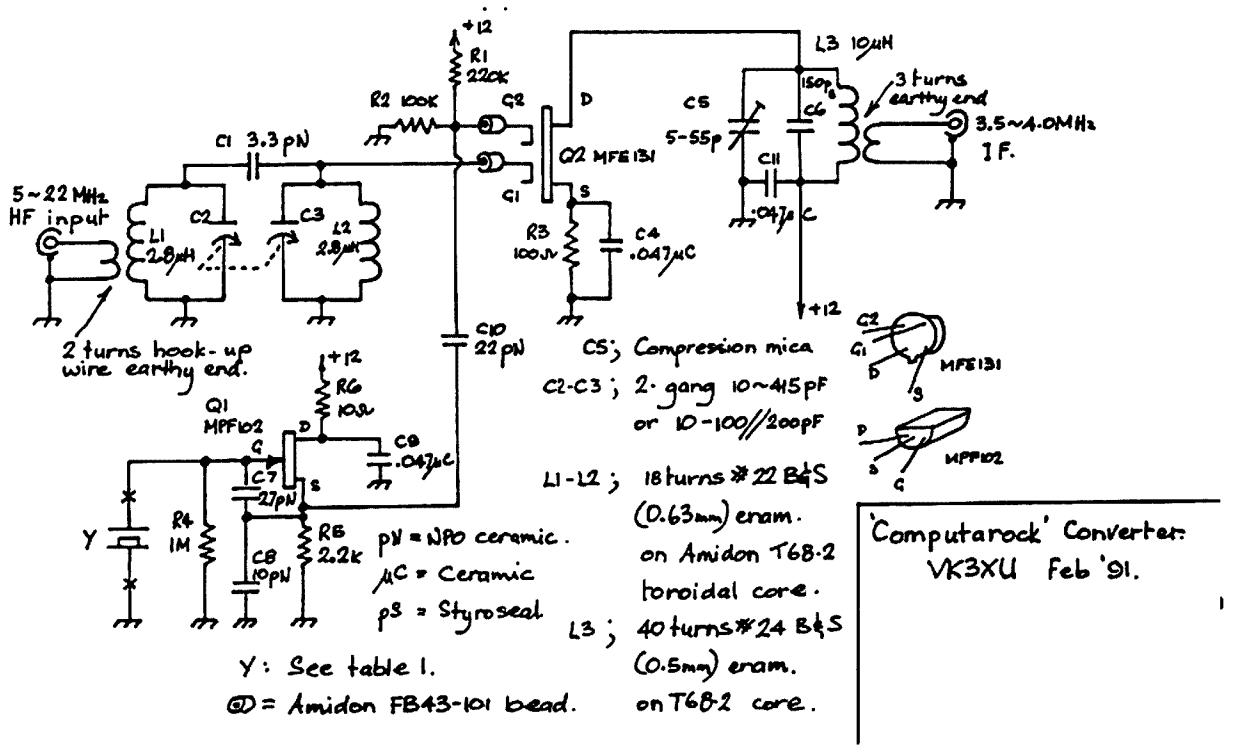
If there is room in the main receiver, the converter may be fitted inside. Alternatively, the converter may be housed in its own stand-alone box to suit, and connected to the receiver via a short coax lead. Perhaps the 12V supply may be



Suggested board layout



The Converter installed in the Super-DC Receiver



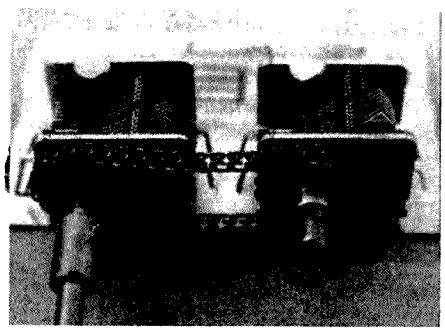
"borrowed" from the receiver also. Only 5mA is required, so a 9V transistor battery would power the converter if no low voltage filtered supply is available.

Only the crystal needs to be changed for each band, so they may be conveniently mounted upon the tags of a two-pole wafer switch to permit rapid band changing. Or the crystals may be simply plugged into a socket. Computer crystals generally have flying leads, so suitable plugs will be required. If you do choose the switch scheme, it is suggested that some spare switch positions be reserved for expansion as other crystals become available.

To suppress parasitic oscillation, a ferrite bead should be installed onto each gate lead as shown. They may be prevented from flopping about by fitting tiny lengths of hook-up wire plastic to the leads each side of the bead, or a small blob of wax.

Fire-up

Check your wiring, and connections for Q1 and Q2. Connect an antenna to the input and apply 9-12Vdc supply. At 7MHz for instance, with an 11MHz crystal you should peak C2-C3 at about mid-travel for strongest signals. Set your receiver to about 3.7MHz (representing 7.3MHz) and peak C5 for loudest band noise or signal.



Alternative capacitor arrangement

Some compromise in setting of C5 may be necessary. If it is planned to do most receiving at the bottom end of the amateur bands (most likely), then C5 could be peaked at say 3.8MHz, leaving adequate sensitivity for the occasions when the opposite end is used (if the idea of twiddling another knob does not worry you, then C5 may be replaced with a variable capacitor of about 100pF).

The image band is obtained by looking for the other peak with C2-C3. It will not take long to get a grasp on the possibilities offered. In some instances where a crystal in the 2-10MHz range is selected, you get a mysterious image band. A harmonic of the crystal is doing the mixing. Some maths will tell the user which band is being received. Naturally, sensitivity is down a bit, but may provide additional useful band exploration.

The two coupled tuned circuits of the filter should peak simultaneously. If there are two distinct peaks, it should be possible to bring them closer together. Alter the inductance of L1 and/or L2 by experimentally bunching or stretching the turns.

Problems

There are no perceived traps for the typical radio/electronics enthusiast. You may get a lazy crystal which will not oscillate. Try inserting a 2.2 or 2.5mH RFC in series with the earthy end of R5 — that should give it a kick-start. If you cannot get your converter to work satisfactorily, please write to me about it, and any reasonable amount of assistance will be returned (SASE please).

Parts

The only difficult component is perhaps the dual gang variable capacitor. Persons who have been in radio for some time are certain to have one from an old broadcast set that you may be able to obtain by negotiation. There are now several vintage radio businesses in the cities, and one of these may also be of assistance. Many older capacitors have a 3/8" shaft, so it may be necessary to obtain

or make a reducing coupler.

Shown is an alternative arrangement. Two of the more readily obtainable 100 + 200pF (total 300pF) capacitors are placed side by side. Fitted to each shaft is a Meccano chain sprocket, and these are coupled with a length of chain to obtain the necessary tracking. Some hobby shops will sell Meccano parts individually.

Computer crystals are available from many of the usual electronics shops. Check their lists for best prices, range and availability. Average cost is about $4.00 each. See Hamads in this journal for suppliers of Amidon cores.

References and Further Reading

1. Converter Tunes 4 to 18MHz, Najork W5FG, *Ham Radio*, May '89
2. *Solid State Design*, Hayward & DeMaw, ARRL
3. White Rose Radio, Hey G3TDZ, *Rad Comm*, Feb '90
4. QRP Classics, ARRL
5. Super-DC Receiver, Diamond VK3XU, *AR*, May '90
6. Modern Receiver Mixers, DeMaw and Collins, *QST*, Jan '81

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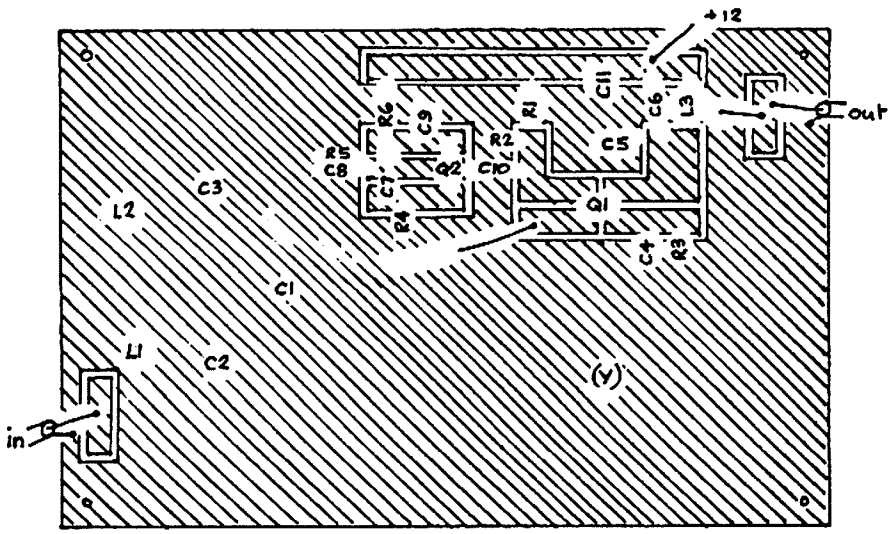
Remember to leave a three-second break between overs when using a repeater



Component locations

Table 1

MHz XTAL	MHz BAND	MHz BAND
2.0	5.5-6.0	-
3.0	4.5-7.0	-
4.0	7.5-8.0	-
5.0	8.5-9.0	-
6.0	9.5-10.0	-
8.0	11.5-12.0	-
10.0	13.5-14.0	-
11.0	14.5-15.0	7.5-7.0
12.0	15.5-16.0	8.5-8.0
14.0*	17.5-18.0	10.5-10.0
15.0	18.5-19.0	11.5-11.0
16.0	19.4-20.0	12.5-12.0
18.0	21.5-22.0	14.5-14.0
20.0	-	15.5-16.0
22.0*	-	18.5-18.0
25.0*	-	21.5-21.0

*Not a known stock frequency at writing

TRY THIS

"Hee Haw" Oscillator

J A Heath VK2DVH

12A Southdown Rd Elderslie Camden 2570

The accompanying circuit is for a "hee haw" unit. This makes a sound similar to a police or ambulance siren and could be used as an audible alarm in conjunction with the alarm circuit published in *AR* Dec 1988.

It works as follows:

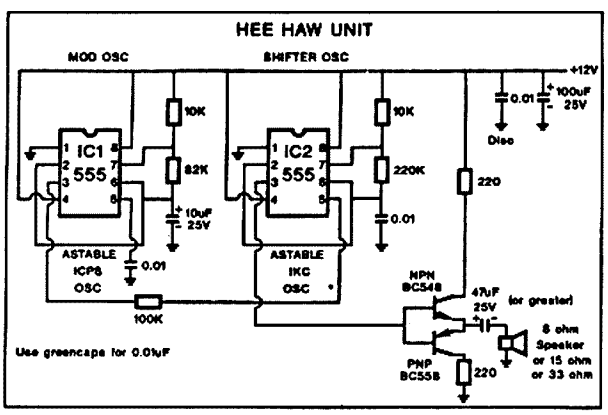
IC1 works as a one-cycle-per-second oscillator

IC2 works as a 1kHz oscillator

IC1 modulates IC2, causing it to shift in frequency

The 555 output is cleaned up and increased in power by the BC548 and BC558 connected as shown. I used an 8ohm speaker, but just about any speaker would do.

I hope you will find the circuit useful.



W1-020-1

Getting Started with Amateur Radio Satellites — Part 5

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD YARRAVILLE 3013

LAST MONTH I DISCUSSED the role of computers in decoding telemetry and predicting antenna pointing co-ordinates. The flavour-of-the-month satellite was Oscar-10, the first of the highly elliptical orbit birds. This month I'm going to look at how you need to upgrade your station to the minimum required to work Oscar-10. I'll then look at 10's elliptical successor, Oscar-13 and describe what you can expect in the way of operating conditions, DX etc.

So far the only antennas mentioned have been 1/4-wave ground planes, 1/2-wave dipoles and small Yagis. If you live in a very quiet location and you're happy working the low-earth orbiters you'll no doubt get satisfactory results using these simple antennas. You may like to try variations like the turnstile or crossed dipole. They represent a worthwhile improvement. The high fliers like AO-10 and 13, however, require somewhat better performance from our antenna systems.

Working the low-earth orbiters involves distances of 2000 or 3000km between you and the satellite. Make that up to 40,000km when AO-10 is at apogee and low on your horizon and you'll agree that if you tried to use a dipole you'd be lucky to even hear a trace of the beacon. If you're going to grapple with these birds you need GAIN.

The first thing to remember is that the satellites have very sensitive receivers and a very quiet receiving location. They can hear you quite well even if you're only putting a sniff of RF at their antenna terminals. I've worked into Oscar-10 at 40,000km with an uplink power, measured quite accurately of 100 milliwatts. I was using a 20-turn helix, one of the antennas I'll be talking about next month. The point I'm trying to make is that it makes a lot more sense to build lots of sensitivity into your receive (downlink) system rather than go for a powerful uplink signal. There is a benchmark to aim for and I'll explain that shortly.

Transponders, being linear devices will retransmit exactly what they hear. If they receive a strong signal it will be retransmitted as a strong signal. If your signal is weak into the device it will appear as a weak signal in the downlink passband. The benchmark, of course, is the beacon. Every station working the bird should be able to copy the beacon loud and clear. If you can't, you should go back to the drawing board on your receive system before you even try to uplink a signal to the transponder. In fact, you should constantly monitor the beacon frequency to ensure that your signal is NO STRONGER THAN THE BEACON. It is logical that it doesn't have to be. It's unfortunate that many signals are heard in the passband with a strength two or more 'S' points louder. Could it be that they are having trouble hearing their own downlink signals so they jack up the power. Consistent offenders become known as ALLIGATORS, (big mouths). Don't become an alligator, it takes a long time to live down a reputation like that. Spend a bit of time on your receive system. Make sure you can hear the beacon. It should be two or three 'S' points above your system noise floor. An excellent test is to listen carefully for the retransmitted transponder noise. This is characterised by a soft woosh, woosh, woosh as the spacecraft rotates about 20 times per minute. Its antennas have three major lobes, and you can hear the rhythmic QSB. If you can hear the transponder noise when the satellite is out near apogee you can guarantee that there is nothing wrong with your receive setup.

Before I look at the uplink setup I want to talk about something called "squint angle". This term was introduced in 1983 by James Miller G3RUH, the author of the now famous Satfoot program, the first graphics program to include a plot of the satellite's footprint on a map of the world. Remember, the footprint is the part of the Earth's surface that the satellite can see. If you are in the footprint you can also "see" the satellite. James also included some calculations in his program to work out which way the satellite is pointing relative to the observer. This printed out as an angle. An angle of zero degrees means that the satellite and, therefore, the satellite's antennas, are pointing right at you. A very good condition for working the bird! A squint angle of 40 degrees means that the satellite antennas are pointing 40 degrees away from you. You can get an excellent idea of expected operating conditions by watching the squint angle in the predictions. James did us all a power of good when he included this essential element in his program. Of course, all the others are now on the band-wagon. Some of them call it off-pointing angle.

I wanted to introduce you to squint before talking about uplink power, since the two are inter-related. I mentioned earlier my effort with 100 milliwatts. This sort of thing is only possible with minimum squint angle and when the satellite is high in the sky. If you tried to do it when the bird was low on horizon, the atmospheric absorption would force you to increase the uplink power many dB. Perhaps up to 10, 20 or even 50 watts to get a signal back. If the squint isn't good when the satellite is low in the sky and out near apogee, it is sometimes very difficult to get a satisfactory signal through.

By and large, however, the uplink presents much less of a challenge than the downlink. So, let's look at some minimum requirements.

I'll divide this into two sections. This month let's assume that we're interested in getting signals through and having contacts under good squint conditions.

You have probably heard of something called circular polarisation. This is one of the most misunderstood terms in the amateur vocabulary. I'm not going to take it any further this month. I'll cover it next time when we look at maximum performance stations. I'm often asked whether to use vertical or horizontal polarisation when using the Oscars. When you think about it, these terms lose their relevance when you point the antenna up in the air. What's vertical and what's horizontal when the antenna is pointed directly up? There is some evidence to suggest that when the bird is low in the sky, vertical has a slight advantage over horizontal. It is only marginal, however, and is probably offset by the increase in noise pickup by the vertically polarised antenna.

Talking in terms of boom length, remember the gain of a Yagi depends more on this than any other factor. You should not contemplate a Yagi of less than two wavelengths for either uplink or

downlink. Since the easiest transponder to work on AO-10 and AO-13 is mode B, we are talking about a 4m long Yagi on 145.9MHz for downlink, and a 1.5m long Yagi on 435.1MHz for uplink. Ten or 12 elements should do the trick. The DL6WU design is hard to beat.

The antennas should be mounted at each end of a horizontal boom. You can make the boom of wood. Give it a good coat of raw linseed oil and mount it on a short pole or tripod. You can work out a hinge mechanism of some sort to allow elevation as well as azimuth pointing. The pole need not be high at this stage. We aren't expecting to work the bird under adverse conditions when it's low on horizon. And you need to be able to set the azimuth and elevation by hand.

With 10 to 50 watts on 435.1MHz this should suffice for your uplink system. The downlink, well that depends on how good your receiver is on 145.9MHz. My suggestion is that you try it and see. If you are getting a reasonable signal from the beacon (when the squint is good) then have a go. Try your uplink and see if you can receive the downlink signal. If you can, then straightaway turn down your power until signal is the same strength as the beacon.

If you can't hear the beacon very well, check your program again for a time of better squint. If you still can't hear the beacon very well, then you will have to improve your receive setup. I'm going to talk about preamps next month. If you have one already and want to use it, make sure you mount it right at the antenna terminals. Even your very best bit of coax will introduce some losses.

You should have noticed when you were working RS-10/11 that if you moved your transmit frequency up a few kHz that the downlink frequency also moved up by the same amount.

You should also have noticed that the frequencies kept drifting apart somehow. This is due to the differing rate of Doppler shift at the two locations. Oscars 10 and 13 mode B use the higher frequency of 435MHz. The Doppler shift at 435MHz is three times as much as at 145MHz. It would be very difficult indeed to control this situation unless something was done. Well, it is done. Mode B transponders invert the whole passband.

That means that if you uplink towards the bottom of the passband, your signal will come out near the top of the downlink passband. Also, if you want your signal to appear as a USB signal on downlink (that's usual) then you need to uplink a LSB signal on 435MHz. Why make it so complicated? This is done to counteract the Doppler shift. It doesn't completely overcome it, but it makes operating a breeze. When the bird is out near apogee you only have to make frequency corrections every few minutes during a contact.

Due to Oscar-10's problems, which I discussed last month, it's rather difficult to work unless it's close in to Earth. Try your station when either Oscar-10 or Oscar-13 are around an hour or so either side of perigee. Then you can look further into the orbit to find the limits of your station. **ar**

Cutty Sark Race

The Pembrokeshire Radio Society will be running a special event station for the Cutty Sark Tall Ships Race. It will be held for the first time on the Milford Haven waterway, Pembrokeshire, Wales.

The Milford Haven waterway is one of the most famous in the UK, having the distinction of being the second natural deep-water anchorage in Europe, also having three oil refineries, two docks and several marinas, all in and around the waterway, to mention just a few. It also has one of the oldest histories, dating back to the Megalithic era of around 2000BC.

The Cutty Sark Tall Ships Race runs from 9-14 July 1991, with a proposed sail past of all the entrants on the Haven on 14 July before heading out to sea for the start. The ships should start arriving from the 7th or 8th, maybe even before. We are hoping for some 60 ships to be in the Haven, from some 18 countries. And the Cutty Sark committee is expecting almost a million visitors over the period. So, it will be a big thing!

Our station will be run from 1 July for 28 days under the callsign GB2TSR (Tall Ships Race), and should be great fun to run and to take part in. The station will be from a caravan in the lower car park of the British Legion, Hamilton Terrace, Milford Haven. This will give us a great view of the Haven, both up and down stream.

We would like as many contacts as possible on all bands and modes, so give us a call on the air.

PAUL A DELANEY GW0HPQ
PEMBROKESHIRE RADIO SOCIETY

Donations to WIA International Representation Fund

Donations to this important fund received at the Executive Office during May have come from:

W Middleton VK3IT
Coffs Harbour ARC
Estate of the late Brian W Austin VK5CA
G Perry VK3PE
Armidale & District ARC
VK2 Division

Propagation of Long Radio Waves

Part 1

JOHN ADCOCK VK3ACA
12 ALBERT STREET, OAK PARK 3046

THE MAIN PURPOSE of this article is to present textbook-type information on the basics of propagation on frequencies between 100 kHz and 200 kHz. Why should people be interested in such an unusual and restricted band of frequencies? Basically because some amateurs in several parts of the world have operated in this region, and if an amateur band is ever allocated in the low-frequency spectrum, it is in this region that such a band would be allocated. Therefore, it is important that interested persons should understand operating conditions on these frequencies.

For some time now, I have been thinking of presenting this article on the subject of low frequency or long wave propagation, but have been deterred somewhat by the difficulty of presenting a clear overall picture. This difficulty is not helped by the apparent lack of suitable references to fill in the picture. I have come to the reluctant conclusion that a lot of gaps in knowledge do exist in the subject, and I will point these out at the end of the article.

As far as I know, no attempt has ever been made before to explain LF propagation in concise terms with the average interested reader in mind, and to point out where it differs from HF propagation. It is, therefore, hoped that this article will become a basic reference for amateur radio on the subject of LF propagation.

There is an enormous amount written on the subject of HF propagation for both the amateur and the professional. This is very well presented for the amateur in texts such as the ARRL Handbook and many others. The subject of LF propagation has been around for a long time, and is covered in great detail in technical books and papers on the subject, but is not covered in amateur radio texts.

Part 1: The Basic Physics of Propagation

Introduction

Propagation of electro-magnetic waves from the longest radio waves through to light waves is affected by the same physical laws, but the physical nature of the media through which the waves pass varies with frequency. The differences are brought about by many different factors, for example, the inertia and movement of charged particles in the ionosphere when acted upon by fields of different frequency.

Propagation of low frequency or long electromagnetic waves (long radio waves) is dependent upon surface waves and, as with HF, waves reflected between the ground and the ionosphere, but their play in the propagation process is quite different from that at the high frequencies. At low frequencies the combined effect of ground and ionospheric reflections results in a wavefront at the surface of the earth similar in character to a surface waves, as we shall see later. This similarity has given rise to the popular misconception that *"low frequencies propagate around the earth by ground wave propagation"*.

In general, the propagation of low frequency radio waves is quite different from high frequency. In fact there is nothing similar in any bands at present held by amateurs. Even propagation at 160 metres is more similar to HF than LF. There are many misconceptions about LF propagation, and it is intended to explain all these things here.

Basic Concepts

In this article it is proposed to use the "light" analogy frequently. Reflection and refraction at light frequencies are exactly the same as at VHF, HF and low frequencies — only the scale changes. To put the two in real terms, the wavelength of red light is a little less than one micron or 10^{-12} metres. In frequency it is about 400 terahertz or 400×10^{12} Hz. This is about 30,000,000 times the frequency of 14 MHz.

Electromagnetic waves at any frequency normally propagate in straight lines, but are bent around curves by the process of reflection, refraction or diffraction. These three processes are the basis of radio propagation.

For the purpose of this article, I refer to HF as the band of frequencies mainly between six and 30kHz, and I refer to LF as the band of frequencies mainly between 10 and 200kHz. Ten to 30kHz is correctly VLF, but in this article I use the term LF or low frequency — a general term covering the general type of propagation to be described.

Refraction

This process is well known to anyone who has studied physics at school, so the effects will be described briefly. An electromagnetic wave of any frequency will travel slightly slower in a medium, such as air, than it will in a vacuum. The amount by which a wave front is slowed down in a medium is dependent upon its "refractive index". In light, this is also known as "optical density", but the process is the same at radio frequencies as at light frequencies. In general, the higher the actual density the higher the refractive index. A vacuum has a refractive index of one, air has a refractive index of around 1.0003. Substances like glass or water are much higher. Cold air has a slightly higher refractive index than warm air. *Refractive index is directly related to permittivity or dielectric constant* and this is particularly important in respect of the ionosphere, as we shall see later.

The effect of a wave front, travelling

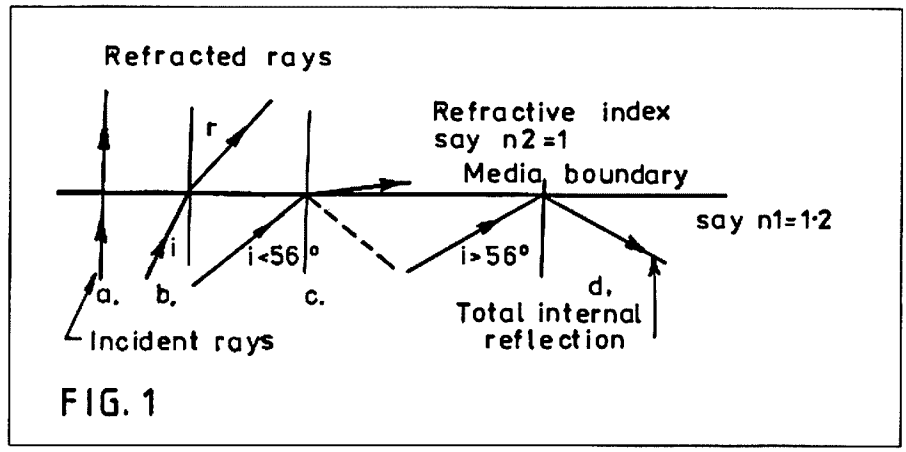


FIG. 1

through a plane that separates media of different refractive indices, is that the wavefront will change its direction at the plane. This is illustrated in Figure 1. When there is only a small change in refractive index, substantial bending will take place only when the direction of travel of the wave front has a small angle to the plane. Examples of refraction of light are well known. In radio there are many examples of refraction. Some examples are bending of VHF waves when they cross a cold front (HF waves are similarly affected although the effect is not as noticeable). Another example is that of the atmosphere, which decreases in pressure and hence refractive index (although the change is very small) with height, and this has the effect of making the horizon distance look farther than in a vacuum. Yet another example of refraction in radio would be the bending in direction of an HF wave as it passes through the ionosphere, as shall be discussed in some detail below.

The bending that takes place when an electromagnetic wave passes from one medium to another is based on the formula —

$$\frac{\sin i}{\sin r} = \frac{n_2}{n_1} \qquad (1)$$

where i is the angle of incidence and r is the angle of refraction, n_1 is the refractive index of the first media, and n_2 is the refractive index of the second medium.

It is important to note that, when dealing with bending of a wave direction at a change of refractive index, the change does not have to be at a plane surface. If the change in refractive index is gradual over a distance, then the bending will take place gradually. This will be dealt with in more detail under total internal reflection.

Reflection

Reflection has taken place at a plane, or virtual plane, when the wave front travelling towards the plane at an angle to the perpendicular, or normal to the plane, is turned (or reflected) away from the plane at the same angle to the normal. "The angle of incidence equals the angle of reflection" (see Figure 2). Also the incident ray, the reflected ray and the normal to the surface at the point of reflection all lie in the same plane and on the same side of the surface. If the surface is uneven and the irregularities are large as compared with a wavelength, the wave front will be reflected in several directions at once, resulting in "scattering". A poorly reflecting surface can result in "loss".

There are two basically different types of reflection.

1. Reflection that occurs at a plane surface is known in physics as "regular or specular reflection" and which we will refer to here as "plane surface reflection".
2. Reflection that occurs when a wave travels from a medium of high refractive index towards a medium of lower refractive index. This process is known in physics as "total internal reflection".

There are numerous examples of both these types of reflection in of radio waves, as we will see in the article.

1. Plane Surface Reflection

This, too, can be divided into two basic types, they are:

1. Reflection at a plane metallic surface. There are no examples of this in nature, but there are plenty of man-made objects for both radio and light using metallic reflectors. These are very familiar to the average amateur and require no explanation.

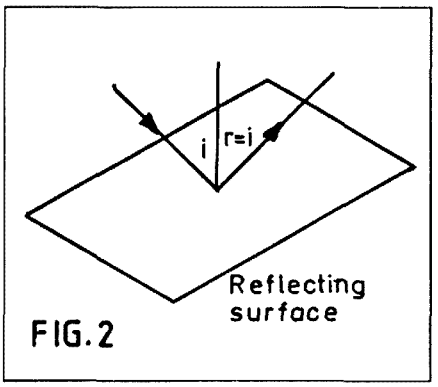


FIG. 2

2. Reflection at either a dielectric surface or a lossy resistive surface. In order for useful "regular" reflection to take place several properties are required. There must be a surface or discontinuity between the two media. Irregularities on the surface must be small as compared with a wavelength; the smaller the irregularities the better the reflection. Conversely, the lower the frequency the better the reflection. The change or discontinuity between the propagating medium and the reflecting surface should be as sharp as possible. That is, a discontinuity which consists of a gradual change in refractive index over many wavelengths will not produce regular reflection, but it may produce total internal reflection, as we shall see shortly. The sharper the discontinuity the better the reflection. The greater the change in dielectric constant or, in some cases, magnetic permeability (both affect refractive index) and/or conductivity the better the reflection. The lower the angle of the incident ray to the discontinuity surface the better the reflection. Reflection can take place when the discontinuity is either of higher refractive index or lower refractive index than the medium of the incident wave. When reflection takes place, only part of the wave is reflected. Some is lost and some may pass through the surface and propagate in a different direction (refraction).

Reflection at plane surfaces is easy to see with light. When light strikes the surface of a plane sheet of glass with an unsilvered surface, the light is better reflected at a low angle to the surface than at a high angle, and not all the light is reflected. Some passes through the glass. If the surface of the glass is rough, scattering takes place and less light is reflected. A similar effect is observed if the surface is dirty. If the surface of the glass was not hard but slowly merged into the air similarly, reflection would be reduced or eliminated. This is not easy to demonstrate with glass, but the effect is very important when dealing with atmospheric and ionospheric effects. An important point to note is that a plane reflector can have quite a poor surface and, in fact, have practically no reflective effect for a vertical incident ray but have quite a good reflective property at a very low angle.

In radio, the best example of plane surface reflection of this type is the reflection of radio waves by the ground, and this displays all the properties listed above. Sea water, which has a higher dielectric constant and better conductivity than soil, is also a better reflector. In fact, water will reflect all waves from radio to light frequencies. Soil will only produce *regular* reflection at radio frequencies where the irregularities are small compared with a wavelength, hence the longer the wavelength (the lower the frequency) the better the reflection.

2. Total Internal Reflection

This form of reflection is a direct result of refraction. In some amateur articles recently it has incorrectly been referred to as refraction. The term is, therefore, a bit misleading. It differs from ordinary refraction or just bending in that the wave is turned around completely and comes out of the reflecting medium at the same angle as it entered. It fulfils all the requirements of reflection given above. See Figure 1. Total internal reflection takes place if the sine of the angle of incidence times the ratio of the refractive index of the first medium to that of the second is greater than 1.

In mathematical terms, and by transposing formula 1:

if $\frac{n_1}{n_2} \sin i > 1$

then sin r is greater than 1. There is no angle for a sine greater than 1 and r is unreal — reflection then takes place.

As a simple example of the above, suppose n_1=1.2 and n_2=1. Then, if the angle of incidence i=30° (60° to the surface), the angle of refraction r=36.8°. If i=60° (30° to the surface), sin r=1.04. Refraction cannot take place and the wave is reflected (see Figure 1). The critical angle occurs when sin i=1/1.2, therefore i=56°.

The old physics term of "total" internal reflection is based on the notion that this reflection takes place inside the higher density media and is not caused by the surface. It is, therefore, lossless. The term "total" is slightly misleading. The reflection loss may in theory be zero but the media through which the electromagnetic wave passes certainly may be lossy.

Total internal reflection, which is the direct result of refraction, differs from plane surface reflection in several major ways. Total internal reflection takes place only when a wave moves from a medium of higher to one of lower refractive index. Like refraction, this reflection can take place over a considerable distance where the refractive index changes very gradually. This is completely different from plane surface reflection as described above. In the case of the ionosphere, bending and ultimate reflection may take place over a distance of thousands of wavelengths; see Figure 3. (If the boundary between the two media is sharp and the angle of incidence is too small for total internal reflection, plane surface reflection and refraction may take place, see the dotted line in Figure 1c.

An example of light being reflected by this process at a diffuse surface would be that of a mirage or reflection from heat haze on a road. This is the same as reflection of VHF radio waves from a temperature inversion.

Diffraction

In some ways this is the most mysterious characteristic of propagation, but it is certainly very important at low frequency. It is a characteristic of all wave motions (even waves on water) that you cannot have a sharp edge to a wave beam. If you try to, the edge of the wave pattern will generate new waves which, in effect, causes the beam to "spread out". The theory is that every point on the edge of a beam (of light, radio waves or even ocean waves) acts as new source of waves. The sum total of all these sources is to produce a beam that spreads out at the edges.

The effect is observed when light is projected at a very small hole; the hole will tend to become a source of light. Another example would be where a laser beam is projected at the moon — the spot on the moon is a lot larger than would be expected from the radiation pattern of the source. On an ocean island, waves come in on every side of the island even though the waves out at sea may be travelling in one direction. In radio, waves bend beyond the horizon, and this is the basis of ground or surface waves. The larger the wave the bigger the corner the wave will bend around. In other words, the effect is a matter of scale.

This effect therefore becomes more significant the longer the wavelength, and will be dealt with particularly under low-frequency propagation.

(To be continued)

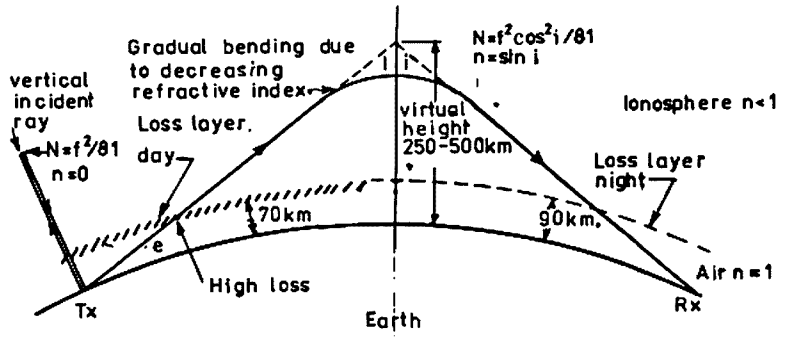


FIG. 3 HF Ionospheric reflection

The Marconi Spirit

Some years ago, Dr W A S Butement VK3AD told me the following story during a business trip to the WRE in VK5. (VK3AD is now an SK).

Bill was studying in London, going for his PhD when he had regular CW QSOs with his high school friend in Wellington, who was the son of the then Prime Minister of ZL.

His friend asked Bill one day to go to the House of Commons in London and observe the debate on a certain matter, which would be of great importance to his father, and if he could obtain and pass on the information via QSO before anyone else in ZL could have it.

Bill did as asked by his friend, and the Prime Minister surprised not only his opposition with the knowledge obtained when the people of ZL were still asleep — even the usually alert press was now guessing.

But a few days later Bill received a letter from the Marconi Company saying: *"Dear Sir, it has come to our knowledge that you have used amateur radio to communicate with New Zealand in a way contrary to the regulation on amateur radio, and the communication used is a monopoly of the Marconi Company. We must insist that you will refrain in the future from this activity, which would result in serious consequences.*

We understand that you are studying for your PhD in radio communication at London University. We would like to assist you in your work. Please contact Mr ....., who will give you radio components — you can select — which you would find hard to obtain otherwise.

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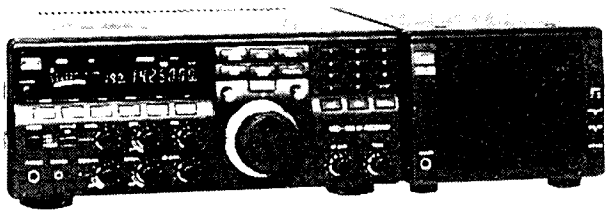

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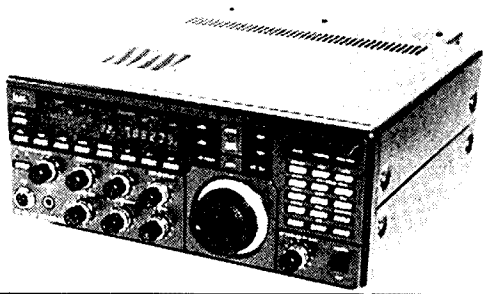

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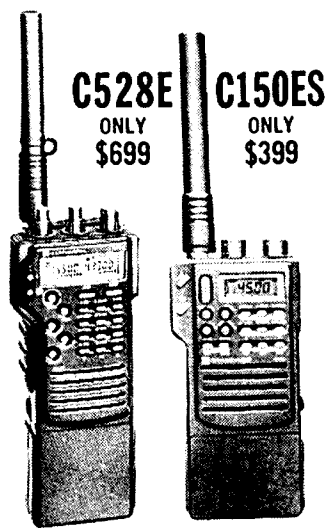

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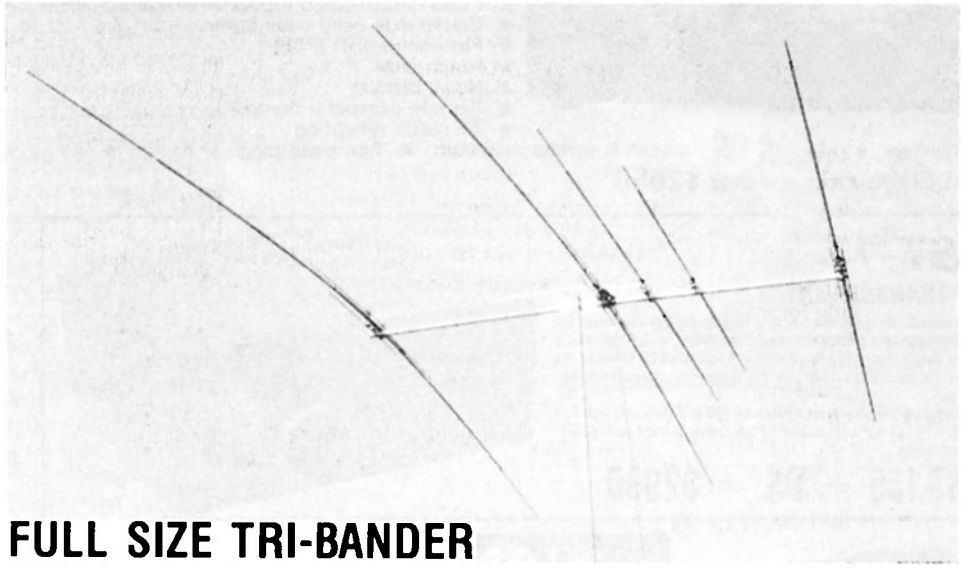

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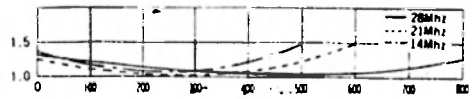

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The Story of Steven Frith

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Meningitis

RECENTLY A FRIEND ASKED me if I could help a very badly disabled person communicate with a computer. The disabled person, Steven, now 26 years of age, had been stricken with meningitis when he was one year old. This had left him unable to talk, and unable to control his arms or legs. His only means of communication was his eyes. He would open them wide for yes, and close them tight for no. There was no way, as far as I could ascertain, he could operate a computer keyboard, but I found that he could operate a switch with his chin, although with difficulty. His coordination was not good, and his body would go into uncontrolled muscular spasms at any moment. He would then be unable to get on or off the switch for up to 30 seconds or so. And control of the computer would have to be made through this single pole chin switch.

I decided to teach him the Morse code and, much to my surprise, he mastered it in less than a month. He would practise for at least three hours a day, and I would leave him perspiring from determination and effort. And what a lift it gave him. Today, two years later, he is more confident and able to express himself.

Computer

His computer program includes a word processor, a vocabulary of some 100 phrases, a four-function calculator, drawing program and some six games, including Pacman, Four in a Row, Noughts and Crosses and Snakes and Ladders. The constant use of the chin switch and the concentration required have greatly improved his control and coordination, and he is improving all the time.

His computer is a Microbee and the programs have been put into four EPROMS. Because the Microbee has a battery backup it is always ready to go as soon as his nurse switches on the mains power.

During the initial stages of this exercise I began to realise how good the Morse code was. Certainly Samuel Morse was more than a pretty face, if it was he who invented the code. Take the letter E, for example. In the average English text the letter E is used more than any other letter (in fact, almost twice as often), and it is represented by the smallest piece of information in the code, ie a dot. The next most used letter is the letter T, represented by a dash.

I was looking through a back copy of the *Scientific American* recently and came across a list showing the frequency distribution of letters in an average English text. This is listed in column 1 of the Table, and the percentage of use in column 2.

Columns 3 and 4 list the Morse code in increasing order of information, that is value of dots and dashes plus spaces. For example, the numeric value of the letter R is 7. One for the dot, one for the space, three for the dash, one for another space, and one for the last dot.

At the time I was interested in a Morse code recognition program where each letter of the alphabet is represented by a unique number. The system I finally arrived at was akin to the binary code. The value of each dot, or dash, depends on its position in the sequence. In the case of the dots, the first one is counted as one. The second dot value is two, third position is four and the fourth 8. The letter H, for example, with four dots, is numbered 1+2+4+8 = 15.

The dashes are numbered, two for the first position, four the second, eight for the third and 16 for the fourth.

With mixed dot and dash letters care has to be taken to number according to the position the dots, or dashes, are in. Take the letter C as an example. The first element is a dash and, being in the first position, its value is two. The second element is a dot and, because it is a second-position dot, its value is two. The third element is a dash, and a third-position dash value is eight. The fourth element in the letter C is a dot, and a fourth-position dot is eight, making a total of 2+2+8+8 = 20. Using this system, it is fairly easy to make up a computer program to count the dots and dashes of a Morse code letter and decode it from its count number.

A simplified system was used for numbers. One dot = 1, and so on up to five dots for 5. One dash = 6, and so on up to five dashes for 0.

Columns 5 and 6 list the letter code system in increasing counts for the 26 letters. Column 6 starts with one for the letter E, to a 21 count for the letter P. There is a gap at number 22, and two other gaps at 25 and 27, there being no Morse letter to fill these. Not all of the possible four-element codes are used for letters. the missing code signals are —. with a count of 22. .-.- for 25, and ..— for 27. There is also one more, —— making a total count of 30. These gaps, or unused numbers, came in useful, and were used for a CLEAR, DELETE and SPACE facility in the word processor used by Steven.

You will notice that the most used letters in the alphabet have the lowest number ratings, and there is a general agreement between the three lists. This must prove something. Did the code authors have automatic reading machines in mind?

Letter	%	Morse Code		Computer Code	
E	13	E	1	E	1
T	9	T	3	T	2
A	8	I	3	I	1+2 = 3
O	8	N	5	N	2+2 = 4
N	7	A	5	A	1+4 = 5
I	6.5	S	5	M	2+4 = 6
R	6.5	R	7	S	1+2+4 = 7
H	6	H	7	D	2+2+4 = 8
S	6	D	7	R	1+4+4 = 9
D	4	M	7	G	2+4+4 = 10
L	3.5	U	7	K	1+2+8 = 11
C	3	V	9	W	2+2+8 = 12
M	3.25	F	9	U	1+4+8 = 13
U	3.25	L	9	O	2+4+8 = 14
F	2.25	B	9	H	1+2+4+8 = 15
P	2.25	K	9	B	2+2+4+8 = 16
Y	2	G	9	L	1+4+4+8 = 17
B	2	W	9	Z	2+4+4+8 = 18
G	2	O	11	F	1+2+8+8 = 19
W	2	Y	11	C	2+2+8+8 = 20
V	1.5	X	11	P	1+4+8+8 = 21
				SPACE	22
J	1	Z	11	V	1+2+4+16 = 23
K	1	P	11	X	2+2+4+16 = 24
				SPACE	25
X	1	C	11	Q	2+4+4+16 = 26
				SPACE	27
Q	0.5	Y	13	Y	2+2+8+16 = 28
Z	0.5	Q	13	J	1+4+8+16 = 29

Table of Letter Usage Frequency

Further Possibilities

There are many disabled people in the community who would benefit from the Morse and computer skills that exist in the amateur ranks. One young lady whom I know of could move only one finger and

Technical Correspondence

Z-Match Assessment

THE STANDARD Z MATCH IS not a good aerial matching unit, and the Ronny version (*AR* March '90) is not as good as the standard.

The G5RV modified version, scorned by Ronny in March '91 *AR* is better because it helps "iron out" the wide variations of loaded Q, which is an inherent characteristic of the basis L network and its Z match derivative. The Q of the Ronny version, as tested by Lloyd Butler (*AR* Dec '90) varies with load and frequency from a low of 0.28 to a high of 8. Is that good? That is, with resistive loads, the unit will not match some common reactive aerials.

The above is supported by my theoretical analysis of the Butler tests. Copies of my worksheets are available on request; include a SAE. The theory is ARRL handbook level.

The Ronnies are guilty of "loose talk" about aerial gain with respect to a dipole. Which dipole and where? Why not use the isotropic (point) source as the reference? That theoretical reference field is always $^{P}/_{4\pi^2}$ watts per square metre or $(30P)^{1/2}/r$ volts per metre. If that seems simple and unambiguous — it is. P is the aerial power, r is the distance in metres from the source.

For more information read the G3VA column in *Radio Communication*, Feb '91.

(The second point, about aerial gain, was referred to the Two Ronnies. They indicated a preference for dipole reference rather than isotropic in that the latter is a theoretical concept, rather than a practical aerial. Ed)

Supplementary Z Match Information

The analysis and tests of the Z match by VK5BR in the May '89 and Dec '90 issues of *AR* overlook some useful information. This paper is a supplement to those excellent papers.

The input to the Z match presents to the transmitter a series resonant circuit comprising C_1, a resistance equal to the transmitter design load and an inductive reactance equal to the reactance of C_1. The Q of that equivalent circuit is —

$$Q_{loaded} = X_{C1}/R = X_{C1}/50 \quad \cdots\cdots(1)$$

Useful information can be derived from that basic statement, eg From Lloyd's Dec '90 paper at Fig 3. C_1 is 160pF for a load of 200ohms at 7MHz. Therefore

the loaded Q is 2.84 and

assuming a TX output of 100 watts

The PD across C_1 is 200 volts,

the Pd across C_2 is 212 volts.

Choose C_1 and C_2 to withstand those potentials, plus a safety factor.

The network beyond C_1 must be equivalent to an inductive reactance, equal to the reactance of C_1, in series with a resistance of 50 ohms. For the above 200 ohm load example, the equivalent inductance is 3.23μH. That is larger than the actual circuit inductance — very puzzling. To add to the confusion, calculate the inductance required to resonate with other C_1 values extracted from the graphs at Figs 2, 3, 4 and 5 of Lloyd's Dec '90 paper (see notes).

The low loaded Q, calculated above, is less than the ideal, but helps achieve good efficiency —

Efficiency = (1-loaded Q ÷ unloaded Q) x 100%

The parallel equivalent circuit of the input can be calculated using a series/parallel transformation and, as Lloyd points out in his May '89 paper, that forms, with C_1, the ubiquitous L network for matching a resistive load to a lower resistance source. The statements for calculating the L network components are included in the opening para of the May '89 paper, these can be simplified by replacing R_s with NR_s ... N must be greater than unity (see refs 1 and 2). The result is —

$$X_1 = NR_s/(N-1)^{1/2} = 50N/(N-1)^{1/2} \ldots (2)$$

$$X_c = R_s(N-1)^{1/2} = 50(N-1)^{1/2} \ldots (3)$$

From (3), N=9.08 when C_1=160pF and the equivalent parallel circuit is 454 ohms in parallel with an inductive reactance of

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The Story of Steven Frith

(Continued from Page 19)

she could not talk. Some thoughtful person realised that she might be able to operate a Morse key and taught her the Morse code. She astounded everybody with her skill and ability with the code and computer, and became a very clever person. I have made multiple choice programs for Steven to find out what he knows. I started off with very simple questions like "Mary had a little —", and he had to indicate which box out of four was the correct answer.

I was agreeably surprised at his general knowledge. He knew where the Pyramids were, for example. I found out that although he was taught to read, he had little spelling skill, but we are working on that. There are many of these unfortunate people in homes and institutions, and all they need is someone to show them the way. The staff and nurses who look after them are usually overworked and unskilled in the use of computers, and it can be far too expensive for their families to get professional help.

Computer programs usually have to be written specifically for the needs of a particular individual, and this can be very expensive. And so it has to be left to volunteers. I can assure amateurs that there is no greater reward than to see a disabled person write something on a computer screen to tell you what he thinks, something he has been unable to do before.

The computer can open up a wonderful new world for the disabled, with access to hitherto unlimited fields of knowledge.

I belong to the Technical Aid for the Disabled, or TAD for short. We have branches in every state and need volunteers with computer and electronic knowhow to help these people. Perhaps you might like to join us? ar

Single Chip Video Camera

Researchers at Edinburgh University, Scotland, have put all of the technology for a video camera onto a single silicon chip. The camera-on-a-chip is less than 10 square millimetres in size. It has an array of 80,000 light sensors and the electronics to control and process the signals they produce, and the chip includes a camera lens. So far the chip produces only black and white images, but work is continuing on a colour version which could be turned into a cheap hand-held video camera.

In its current form it will be used in a surveillance camera — with video toys and other consumer electronic wizardry expected to follow.

160 ohms (3.63µH). The parallel equivalent of the series combination — 50 ohm and 2,23µH is the same.

With a TX input of 100 watts, the PD across 454 ohms is 212 volts.

The coupling networks L_1/L_2 and L_3/L_4 can be analysed using the network of fig 6 in the May '89 paper. I prefer statement (4) below because one less series parallel transformation is needed for a parallel circuit analysis, and it provides more direct information of the effect of secondary impedance.

$$Z=Z_1+[X_M)^2R_2/(R_2^2+X_2^2)-J(X_M)^2X_2/(R_2^2+X_2^2]...(4)$$

X_M is the mutual reactance of circuits 1 and 2

Z_1 is the impedance of circuit 1 with circuit 2 open

R_2 is the load resistance

X_2 is the total reactance of circuit 2.

For the 200 ohm 7MHz example (L_3=2.52uH,L_4=2.28uH,M=1.53uH) the equivalent series circuit is 18.1+j102 we are looking for 50+j142. The equivalent parallel circuit is 590 ohms in parallel with 2.38µH — we want 454 ohms in parallel with 3.63µH. N is 11.8, not the 9.08 predicted above. The differences might be attributed to measurement errors of L and K.

There are better matching units — easier to design and with more predictable performance. I advise prospective owner/builders to use statement (4) to determine the effect of complex loads before deciding to go ahead. Note that if X_2 is zero, the coupled impedance is a resistance. It might be an advantage to resonate the load with post L_2 or L_4 reactance.

Addendum

Another word of caution — the original (W1CJL) version was used as a valve PA tank circuit. These are high impedance sources and there are problems in adapting the idea for 50 ohm sources. Various writers have condemned the unit as unsuitable for 50 ohm sources, and Louis Varney (G5RV) recommends his modified version described in *Radio Communications* Oct '85. I recommend a study of that paper.

It is a curious fact that all writers have avoided a complete mathematical analysis to support their statements. Lloyd's analysis in both papers has significant omissions; not the least of these is the puzzle mentioned above.

Note: Copies of my calculation worksheets are available for anyone interested — these contain more detail including the effect of reactive loads and the answer to that puzzle.

References:

(1) The Lazy PI-L Lawless *AR* Jul '86

(2) Topical Technicalities — L Lawless *AR* Mar '88

(3) Analysis of the Z Match — Lloyd Butler *AR* May '89

(4) Tests on the Compact Z Match — Lloyd Butler *AR* Dec '90

(5) An improved Z Match ASTU — Louis Varney *Rad Com* Oct '85

LINDSAY LAWLESS VK3ANJ

BOX 112 LAKES ENTRANCE 3909

Lindsay Lawless & the Z Match

As the previous articles by VK3ANJ both refer to my own two articles on the subject, I have been given the opportunity to comment on what he has said.

Lindsay has offered an alternative formula for calculating the L network values and a formula for deriving the reflected impedance components at the primaries of the coupling coil networks. He has also made use of some of the results I obtained in my December 1980 article to do some calculations.

He has taken a sample from my article of a 200ohm aerial load requiring an input capacitor C1 value of 160pF. He has pointed out that the shunt inductance required (3.23µH) is greater than the coil inductance and he has quoted this as being a puzzle. He also stated that lack of analysis of this puzzle in my earlier May 1989 article was (to quote) "a significant omission". Well, I did explain this in my earlier article. If you place a capacitor in parallel with an inductor, the current through it is in antiphase to that through the inductor and the combined circuit can be made to look as though it is an inductor of higher value than the inductor on its own. The higher value of inductance is tuned by the setting of the capacitor which, in the Z match unit, is capacitor C2. Hence C2 is really the shunt inductance adjuster. A diagram with supporting conversion formula (figure 5) was included to illustrate the principle. So where is the puzzle and the omission?

In his letter to the editor of 8.3.91, he declares that the Z match is not a good aerial matching unit. His only support for this declaration is that the loaded Q varies over the tuning range and he has quoted figures he has worked out as ranging from 0.28 to 8. Referring back to his article, he has given us the well-known formula for efficiency.

% Efficiency = (1 — Loaded Q/Unloaded Q) x 100

Now the coils in the Z match units have dimensions which could well be expected to deliver a Q of say 150 as a typical value. The unloaded Q is largely dependent on the coil Q and, using the figure of 150 for unloaded Q and Lindsay's figures of 0.28 to 8 for loaded Q, we calculate efficiencies ranging from 99.7 per cent to 95 per cent. On these figures we hardly have an efficiency problem. Of course the coil Q varies with frequency, but even if this falls to as low as 50, the efficiency calculations still give us a tolerable figure. There is not much of an argument against the Z match here, so what else is there?

Tank circuits in the output of class C or single-ended class B RF power amplifiers need a controlled value of loaded Q, a compromise between minimising harmonics generated in the pulsed tuned circuit (requiring high Q) and achieving high efficiency in the tank circuit (requiring low !). However, our Z match tuner is not a tank circuit, its function being to transform a complex load impedance to a specific resistive impedance load. Desirable loaded tank Q in a transmitter is in the vicinity of 10 or 12. As given by Lindsay, the loaded Q of the Z match is generally much lower than this, and hence it hardly performs any function of improving the waveform coming from the transmitter. I guess there is some confusion in that the present Z match tuner seems to have evolved from a similar earlier system in which the circuit was also the tank of a valve power amplifier. In that circuit, the value of loaded Q would have been important.

All in all, the Z match tuner has a lot of attractive features. I outlined these in my December 1990 article. Bench tests on the Ronny unit showed it up in a very good light and it seems to perform well in the field, matching up to all sorts of odd lengths of wire. I must say that Lindsay will have to come up with more convincing arguments before he can persuade me that there is something drastically wrong with its design.

Concerning Lindsay's comments about writers avoiding a complete mathematical analysis, I think he should bear in mind that this is an amateur radio journal, not the proceedings of a professional engineers society. As technical writers we are amateurs who try to do the best we can at a level we hope will suit our average reader.

LLOYD BUTLER VK5BR

18 OTTAWA AVE, PANORAMA 5041

ar

Communications Link with Space Shuttle

RAAF Williams and STS-37 "Atlantis"

HARRY STOCKDALE VK3TGE, PETER ORMEROD VK3CPO,
WITH BRUCE KENDALL VK3WL

THE RAAF WILLIAMS AMATEUR Radio Club VK3APP, situated at Laverton, Victoria, has chalked up another first for the Royal Australian Air Force.

The club, which was re-formed in October 1990, has become the first RAAF club to communicate successfully with an orbiting spacecraft.

Members of the club discovered that the recent Space Shuttle mission STS-37 (Atlantis) included a program designed to allow Australian school students to talk to crew members of "Atlantis" during the mission. Three orbits were dedicated to the program. These were orbits 14, 29 and 59, with one station each from the west, central and east Australia participating on each pass.

The club made application on behalf of the RAAF School of Radio at Laverton to participate in the program and was successful in its application. A total of only nine stations/schools throughout Australia were able to take part in the trials. These were VK6KAE/Northampton, VK5AGR/Adelaide, VK3APP/Laverton, VK6FT/Geraldton, VK3YXK/Geelong, VK2EMU/Hurstville, VK6BMD/Perth, VK3CFI/Colac and VK4JON/Innisfail.

VK3APP was allocated orbit 14, our window of which occurred just 18.5 hours after launch, at 2125 local on Saturday, 6 April 1991.

In the days leading up to the launch, members of the club monitored "Voice of America" transmissions and the AMSAT AUSTRALIA net to determine the exact time of "lift off". When the launch was confirmed, computations were run to determine accurately the time for our allotted window.

Students from the School of Radio chosen as representatives to make the attempt included two radio apprentices, one adult trainee and a communications operator trainee.

Each of the representatives was required to attend a club meeting prior to the attempt to discuss the radio procedures that would be used during the contact (and to work out what they were going to say to the astronauts).

At this point, orbit 13 was taking place, and one of the astronauts, Ken KB4AWP, put out a call "is there anybody down there?", to which a reply was sent from VK3APP. To the best of our knowledge at this stage, a two-way QSO did take place confirming that our station was working satisfactorily.

The shuttle traversed the night sky from west to east at an altitude of approximately 450km and at a distance from Laverton of around 1200km. From horizon to horizon the pass lasted only 10 minutes. Of that time, only five minutes were available for the attempt.

As Atlantis rose above the western horizon, it could be clearly heard talking to the VK6 station, and then the moment that we had all been waiting for, "Victor Kilo Three Alpha Papa Papa this is KB5AWP Atlantis calling, do you copy".

The station operator chosen for the attempt, Peter Ormerod VK3CPO responded to the call and then passed the microphone to apprentice Nigel Gilchrist to carry on the contact.

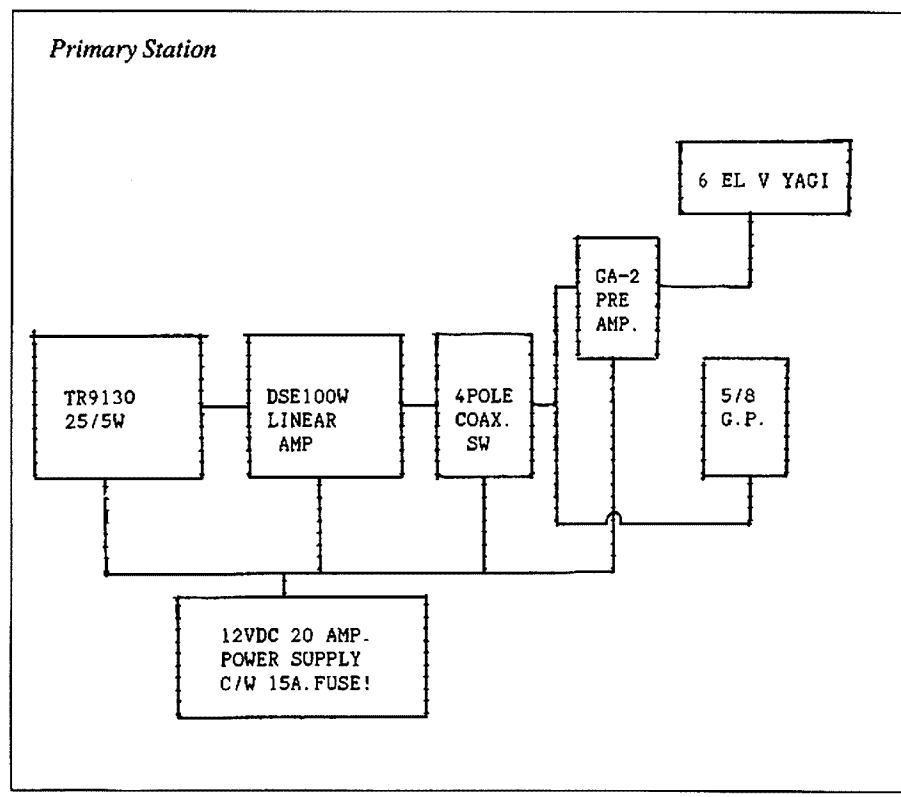
During the contact, Wing Commander Val Robinson the Commanding Officer of the RAAF School of Radio, listened intently as his students created a little history.

At about this time Murphy entered the fray. Prior to orbit 13, Peter VK3CPO had operated with a TR9130 feeding five watts into a DSE 100-watt power amplifier. Receiver input was via a Kuranishi Instruments GaAs FET GA-2 preamplifier. This equipment line-up appeared to be working fine. During the interval between orbits 13 and 14, Murphy #1, in the form of the owner of the power amplifier (we know who he is!), turned this piece of equipment OFF. When it was our turn to QSO with Atlantis, Peter VK3CPO presumed that the station configuration was as he had left it after the orbit 13 contact.

The following rapid sequence of events then occurred:

— The first couple of attempts to make contact with "Atlantis" took place with only 5 watts from the TR9130. As a result, we were not heard.

— At some time during the next few



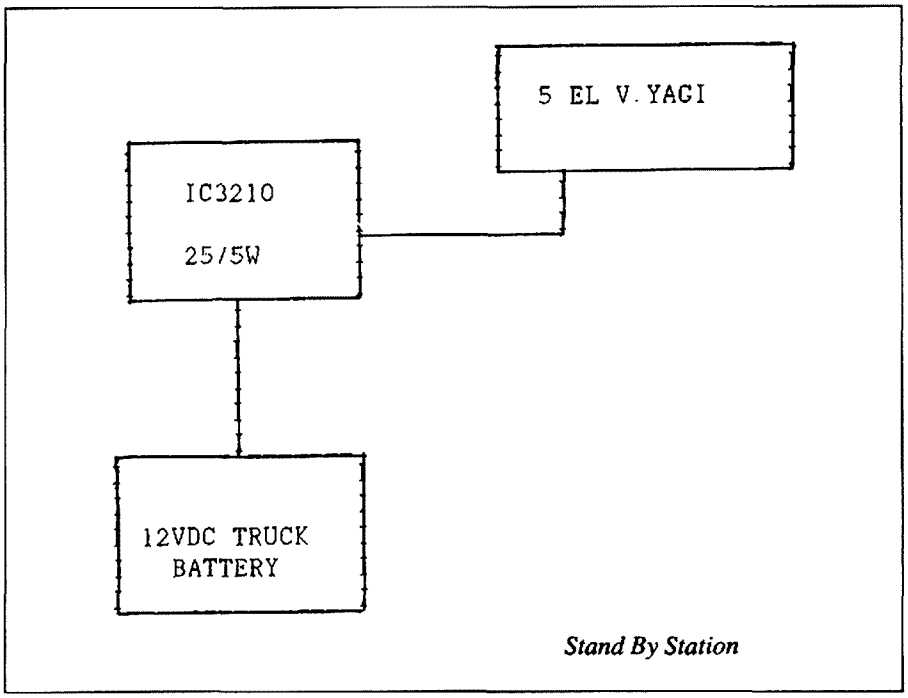
tries the TR9130 was accidentally switched to 25 watts (bear in mind that prior to and during the attempt Peter had no fewer than four television cameras and many microphones from the media contingent on all four sides of the operating position, which would have heightened the adrenalin flow somewhat).

— Not long after this, Peter noticed that the linear was OFF and immediately switched it back on, but, in the heat of the moment, did not turn the 2m transceiver back to the 5W power setting. Thereafter, Ken KB5AWP on board "Atlantis" could certainly hear us! But not for long.

— For a couple of overs we had near perfect two-way communications. Information about our club and that four students would be asking questions was relayed.

— Enter Murphy #2. The 20-amp power supply only had a 15-amp fuse in the secondary line! This was unknown to us at the time and didn't cross anybody's mind as it had not been cause for concern during any of the prior test transmissions.

— With the 2m transceiver 25 watts, the linear (100W?), and the preamp all drawing just a little bit of current, the 15-amp fuse decided, space shuttle or no space shuttle, it was time to pull the pin and blow!



Stand By Station

At this point, Peter, who quickly rose to the occasion, transferred operation to the standby equipment. This consisted of an Icom IC-3210 and a 12V truck battery (no power supply problems here!).

Apprentice Nigel Gilchrist finally got to ask Ken some questions, and received a reply just prior to the shuttle disappearing over the horizon.

The five astronauts aboard "Atlantis" were Steve Nagel N5RAW, Ken Cameron KB5AWP, Jay Apt N5QWL, Linda Goodwin N5RAX and Jerry Ross N5SCW.

The station equipment for this attempt was as follows:

Primary station: Kenwood TR9130 52/25W, DSE 100W linear, Kuranishi Instruments GA-2 GaAS FET preamplifier, 12VDC 20A power supply, six-element vertically polarised Yagi antenna at 60 feet and a 5/8 ground plane antenna at 20 feet.

Secondary station: Icom IC3210 5W/25W, 12VDC battery, five-element horizontal polarised Yagi at 55 feet.

Despite the mixed success of the attempt, a two-way QSO did take place and it was a valuable learning experience for all concerned.

The media coverage that was gained for our hobby was invaluable and again demonstrated to the general public what amateur radio is capable of achieving.

Steps are also being undertaken to ensure better success, if there is a next time. At the least, the club will end up with an improved OSCAR station. In addition, every skerrick of equipment will be checked inside and out before the event. Remember Murphy's Law.

The RAAF Williams Amateur Radio Club meets each Friday evening at 1930 EST at RAAF Williams, Laverton Base Victoria. Visitors are most welcome and enquiries should be directed to: FltLt Harry Stockdale VK3TGE, tel 368 2295, WOFF Mick Lindsay VK3ZMN, tel 368 2547, FSgt Peter Ormerod VK3CPO, tel 368 2266, or Bruce Kendall VK3WL, tel 741 1127.

The club net is conducted on 147.800MHz FM every Wednesday at 2000 EST.

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Preparation for WARC-92

BY THE INTERNATIONAL RADIO CONSULTATIVE COMMITTEE (CCIR) OF THE ITU
DAVID WARDLAW VK3ADW
WIA WARC CO-ORDINATOR

THE CCIR HAS BEEN SET THE task of producing a report which is to provide the technical and operational basis for the work of WARC-92.

As additional funds were not made available for the CCIR to have its usual preparatory meeting to prepare the CCIR report, it was necessary for the needed preparatory work to be done through the CCIR study groups, which already have a heavy ongoing workload of technical studies covering all aspects of radio communication.

To produce the CCIR report which was to go to the World Administrative Radio Conference to be held in 1992 a Joint Interim Working Party of all CCIR study groups was formed, known as JIWP WARC-92.

There are 10 CCIR study groups, each dealing with specific radio services or particular aspects of radio communications. For example, Study Group 8 deals with the Mobile and Mobile Satellite Services, Amateur and Amateur Satellite Services and the Radio Determination Service; and Study Group 4 deals with the Fixed Satellite Service.

In order to cover these items on the agenda of WARC-92 and to provide material for JIWP WARC-92, a number of interim working parties (IWPs) were set up. In the event of more than one study group being involved, they were called Joint Interim Working Parties (JIWPs).

The meetings of these JIWPs and IWPs forwarded their output material to the CCIR, which used it to make up the draft report that JIWP WARC-92 was to consider.

Work of JIWP WARC-92

The Draft Report, along with 65 other submissions from various administrations and international organisations which suggested modifications to the Draft Report, was considered by the participants at the JIWP.

After having finished their consideration of all documents put before them, the delegates to the JIWP agreed on the substances of their report to be forwarded to the WARC.

The 11-man Australian delegation to the meeting, which included WIA representative David Wardlaw VK3ADW, was led by DoTC and covered a wide range of spectrum users.

The total participation was over 300 from 34 countries.

Fourteen international organisations and seven scientific or industrial organisations. This was a much greater number than was expected.

There were seven countries from Region 3 represented: Australia, China, Iran, Japan, Korea, New Zealand and Singapore. There were four countries from Region 2. The remainder were from Region 1 and then mainly Europe.

Amongst the delegates were 33 amateurs from 14 countries in all continents except South America (there were only three delegates from one country from South America).

The chairman of the meeting was Mr Murray Hunt of Canada.

The JIWP was split was three working groups (WG)

WG1 Matters below 1GHz
WG2 Matters between 1GHz and 3GHz (the heaviest load)
WG3 Matters above 3GHz

David Wardlaw was appointed co-ordinator within the Australian delegation for matters concerned with WG1.

WG1

There were four main issues that were dealt with by WG1.

1. High Frequency Broadcasting
2. Low Earth Orbiting Satellites
3. Wind Profilers (Doppler radars firing vertically which are able to detect atmospheric wind changes)
4. Extra Vehicular Communications in Space Using Frequencies Around 400 MHz.

The chapter dealing with HF broadcasting emphasised the need for broadcasting to change to SSB in order to maximise the use of the spectrum.

The characteristics of the amateur service and its family of frequencies and sharing problems were maintained in the report without alteration from the original which was derived from two earlier working parties. The IARU had presented input documents to both IWP8/15 (dealing with mobile matters and also including the amateur and amateur satellite service) and JIWP 10, 6, 3, 8/1 (dealing with HF broadcasting and sharing by other services in the HF spectrum) on behalf of the amateur service. The material for these documents was prepared by amateurs in USA, UK, Australia and Poland.

This working group had by far the greatest volume of documents to deal with. It was the WG that covered the main items on the agenda for WARC-92 such as Satellite Sound Broadcasting, Land Mobile Satellite, the Radio Telecommunications Service and Public Correspondence from Aircraft (by satellite).

Although this was not a frequency allocation meeting, the amount of spectrum required for new uses was estimated and sharing criteria developed (this may mean no possibility of sharing). Also, preferred parts of the spectrum were indicated, where propagation, path losses and other features would be optimum.

Pointers are that the 2300-2450MHz amateur band is at risk. Currently the amateur service shares it with other services in such a way that world-wide amateurs have access to it to some extent or other (eg the USA has 2300-2310MHz and 2390-2450MHz). Australian amateurs share the band with Multipoint Distribution Services.

The seriousness of the investigations in this part of the spectrum is emphasised by the fact that interference levels from microwave ovens etc in the 2450+/-50MHz Industrial Scientific and Medical (ISM) band are being looked into. In the past communications services were just warned that there was no protection in ISM bands.

To date there is no pressure on the 1240-1300MHz band.

WG3

Above 20GHz we should maintain our bands as none of the frequencies looked at for High Definition Television (HDTV) involves any amateur bands.

Threats to Amateur Bands

The other main threats to amateur frequencies are at 7MHz in Region 2 from HF broadcasting, and at 70cm from wind profilers. The wind profiler people are also interested in a frequency around 50MHz (as well as at 1000MHz, but this does not affect amateurs).

Low Earth Orbit mobile satellites are looking at spectrum on either side of the 2m band.

Continued Page 51

DON'T BELIEVE US?

"The Best of the Best!"... That's what Yaesu and Dick Smith Electronics think of the FT-1000 deluxe HF all-mode transceiver. But don't believe us- read what the experts have to say...

On documentation

"clearly written and complete, and includes a complete set of schematics and many high quality photos" — QST "The quality of printing and presentation of this book is the best I have seen..." — AR

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"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the icom IC-781 or the Kenwood TS-950S." — ARA "...I found the FT-1000 easier to learn and use than any other radio in its class." — QST

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"On receive, the performance was often beyond the limit of the latest professional measuring equipment, with no measurable trace whatsoever of synthesizer phase noise." — PW "...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." — QST* "The direct digital synthesizer works very well and produces receiver performance that sets new standards." — AR "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter — SSB

"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST "Reports were all very favourable, especially when using the speech processor." — AR "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

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"Using the set on HF packet was an absolute pleasure..." — PW "RTTY and packet radio operation with the '1000 are straight forward..." — QST "Packet and RTTY modes were tried and proved just superb." — ARA

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"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW "...the FT-1000 represents unbeatable value..." — AR "It is an excellent set worthy of accolades and rave." — ARA "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST*

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AR — Amateur Radio August 1990
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FT-290RII with flexible rubber antenna covers 144-148MHz.

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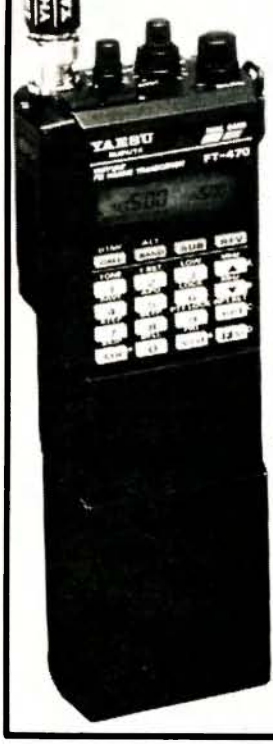

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Cat D-3360

See A.R.A review Vol 12, Issue 5, or A.R. review Aug '89 issue.

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AWARDS

PHILL HARDSTAFF — FEDERAL AWARDS MANAGER VK3JFE/FK1TS
PO BOX 300, SOUTH CAULFIELD, VIC 3162

IRCs

You will probably read elsewhere in this issue a letter from Frank Macklin VK1ZL regarding his experiences with IRCs. I would just like to thank Frank for his letter and would like to finish with IRCs for a while by just summarising that they are in fact worth $1.20 to redeem, and if you have any problems tell the person behind the counter to look at section 10.23 of their regulations.

WAVKCA

I received a batch of WAVKCA certificates this week from the printer and will be busy for the next few nights trying to clear the backlog. So, if you know someone who is waiting for one, they should have it by the time you read this. Contrary to what I stated a column or two back, they were printed on heavy paper and had a slight change of colour, with the slightly yucky green being replaced with a light shade of blue. The basic design has been retained, but the colours look much better.

Ukraine Contest Club

This award will be presented to qualifying radio amateurs throughout the world. The basic award is granted for valid contacts with 10 members for stations outside Europe and 20 members for stations in Europe. Seals (stickers?) can be earned for higher total contacts.

Bronze	—	15
Silver	—	20
Gold	—	30

No QSL cards are needed. Contacts may be any mode 1.8 to 30MHz. For an award, send a verified list of contacts with five IRCs to:

Awards Chairman
PO Box 4850
ZAPOROZHYE
330118
Ukraine
USSR

List of Members of Ukraine Contest Club

RB4JF, RB4MF, RB5AA, RB5CB, RB5FH, RB5IM, RB5JX, RB5MF, RB5PE, RB5QRQ, RB5QW (President), RB5SA, RB5TK, RB5VT, UB3MP, UB4MM, UB5IFZ, UB5LF, UB5MD, UB5MW, UB5PAG, UB0QQ, UB0QZ, UT4UW, UT4UZ, UY5EG, UY5ZM, UY5OO, UB3IWA, UB4CWW, UB4IXZ, UB4ZML, UT4UXW.

Moorabbin and District Radio Club — Moorabbin Award

I recently received a copy of the new and simplified rules for this award from Alan Doble VK3AMD. Alan tells me that the certificate is 30cm by 20cm and is attractively coloured green and blue with black lettering on heavy cream cartridge paper. The award shows a map of Port Phillip Bay with main cities and country centres marked in.

Moorabbin Award Rules

1. This open award is available to any licensed amateur who has submitted evidence of two-way contacts with M & DRC Station (VK3APC) and/or member stations (identifiable by callsign); and to any SWL who submits evidence of having heard contacts between amateurs and member stations.
2. Contacts may be made on any band and any mode.
3. The award is issued on a point-scoring system: club members — 20 points required; non-club members — 15 points; SWLs — eight points; overseas stations — five points or one contact with the club station (VK3 APC).
4. Awarding of points is based on the following schedule for each contact

Mode of Contact

Station	Phone	CW	Packet	RTTY
VK3APC	3	10	7	5
M & DRC Member	1	5	5	4

Stations may be worked only once per band, per mode. A separate award may be claimed for each mode qualified for.

5. Contacts made as from 1 June 1983 on are valid for award points.
6. Proof of contact to be by log extract showing date, time (UTC), callsign of station worked, frequency, mode of emission, signal report and point claimed.
7. Applications for award to be sent to the:
   Awards Manager
   PO Box 88
   East Bentleigh Vic 3165
   Together with a fee of $3.00
8. The M & DRC holds a regular club net on 3.567MHz each Monday night at 8.00pm local time.

ar

Support the WIA in order to protect amateur radio frequencies at WARC '92

CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CO-ORDINATORS)

As a result of recommendations accepted by the 1991 Federal Convention, several changes have been made to future contests.

The one with the greatest impact is: "Entrants to the RD contest to submit a summary sheet instead of a log".

However, any log may be called up by the contest co-ordinator, to prove the summary sheet.

For the VK/ZL contest, certificates will be awarded to the top scorer in each country, if there are more than five entries from that country. If less than five entries from that country, scores of more than 500 points will receive a certificate.

Five recommendations were accepted for the Ross Hull Contest, and these will be advised later this year.

Points obtained in the six-hour section of the John Moyle Field Day do not count towards the overall HF contest trophy.

Neil VK6NE
Federal Contest Co-ordinator

The 32nd All Asian DX Contest — 1991

Supported by the Ministry of Posts and Telecommunications of Japan.

1. Contest period: "Effective 1991, date of AA DX contest has been
   (1) CW: 48 hours from 0000 UTC the third Saturday of June to 2400 UTC next day (15-16 June 1991)
   (2) Phone: 48 hours from 0000 UTC the fourth Saturday of September to 2400 UTC next day (7-8 September 1991)
2. Bands:

Amateur bands below 30MHz (except 10, 18, 24MHz)

3. Entry Classifications:
   (1) Single operator, 1.9MHz band (CW only)
   (2) Single operator, 3.5MHz band (including 3.8MHz band)
   (3) Single operator, 7MHz band
   (4) Single operator, 14MHz band
   (5) Single operator, 21MHz band
   (6) Single operator, 28MHz band
   (7) Single operator, multi band
   (8) Multioperator, multi band
4. Contest Call:
   (a) CW ... "CQ AA"
   (b) Phone ... "CQ Asia"
5. Exchange:
   (1) For OM stations: RS(T) report plus two figures denoting operator's age
   (2) For YL stations: RS(T) report plus two figures "00 (zero zero)"
6. Restrictions on the Contest:
   (1) No contact on cross band
   (2) For participants of single operator's entry: Transmitting two signals or more at the same time including cases of different bands is not permitted
   (3) For participants of multioperator's entry: Transmitting two signals or more at the same time within the same band is not permitted, except in case of different bands
7. Points and Multipliers
   (1) Contacts among Asian stations and among non-Asian stations will neither count as a point nor a multiplier
   (2) (a) Points ...Perfect contact with Asian stations (excluding US auxiliary military radio stations in the Far East, Japan) will be counted as follows:
   1.9MHz band ..... 3 points
   3.5MHz band ..... 2 points
   Other bands ..... 1 point
   (b) Multipliers ...The number of different Asian prefixes worked on each band, according to the WPX Contest rules. Example: JSøABC/7 will count for prefix JS7.
8. Scoring:

(The total of the contact points on each band) x (The total of the multipliers on each band).

9. Instructions on the summary and log sheet:
   It is recommended to use JARL AA contest logs and summaries which are available from HQ for one IRC and SAE.
   (1) Each summary sheet must include your DXCC country, call used, entry class, multipliers by band, points by band and total score. It should also include a signed declaration indicating that you have observed the rules and regulations of the contest.
   (2) Log sheet must contain band, date, time in UTC, call of station worked, exchange sent, exchange received, multipliers and QSO points. Use a separate sheet for each band. Multipliers should be clearly marked by countries or Asian prefixes, first time worked on each band.
10. Awards:
   (1) For both Phone and CW, certificates will be awarded to those having the highest score in each entry in proportion to the number of participants from each country and also those from each call area in the United States.
   (a) The number of participants under 10.....
   Award only to the highest scorer.
   (b) From 11 to 20.....
   Award up to the runner up.
   (c) From 21 to 30.....
   Award to the top three
   (d) From 31 or more
   Award to the top five
   (2) The highest scorer in each continent of the single operator and multi-band entry will receive a medal from JARL and certificates from the Minister of Posts and Telecommunications of Japan.
   (3) The highest scorer of the multi-operator multi-band entry in each continent will receive a medal from JARL.
11. Reporting:
   (1) Submit a summary sheet and logs of only one classification.
   (2) The log and summary should be **postmarked** by the following dates addressed to JARL: All Asia DX Contest, PO Box 377, Tokyo Central, Japan. Indicate Phone or CW on the envelope.
   (a) CW ..... 30 July 1991
   (b) Phone ..... 30 September 1991
12. Disqualifications:
   (1) Violation of the contest rules.
   (2) False statement in the report.
   (3) Taking points from duplicate contact on the same band in excess of 2% of the total.
13. Announcement of Results:
   (1) CW ... About February 1992
   (2) Phone ... About April 1992
14. Countries List of Asia.

A4	JT	VS6	3W, XV
A5	JY	VU	4S
A6	OD	VU (Andaman &	4W
A7	S2	Nicobar Is)	4X, 4Z
A9	TA2-8	VU (Laccadive Is)	5B
AP	UA9, 0	XU	7O
BV	UD	XW	8Q
BY	UF	XX9	9K
EP	UG	XZ	9M2
HL	UH	YA	9N
HS	UI	YI	9V
HZ	UJ	YK	J2/A(Abu Ail, Jabal at Tair)
JA	UL	ZC4	
JD1	UM	1S (Spratly Is)	

(Ogasawara Is)

• You may receive contest results by enclosing one IRC and SAE with your log.

Australasian Sprints CW and Phone July 1991

The Adelaide Hills Amateur Radio Society Inc is pleased to announce that the sixth series of the annual Australasian Sprints will be held during July 1991.

Both of these contests, which are for CW and phone operators respectively, and are of one-hour duration on 80m, are open to all appropriately licensed amateurs in VK, ZL and P2 call areas. As in past contests, a section is provided for SWLs.

The Australasian Sprints are endorsed and co-sponsored by the South Australian/Northern Territory Division of the Wireless Institute of Australia and the Adelaide Hills Amateur Radio Society, and certificates and

trophies will be awarded to call area winners and overall winners. This year, a certificate will be awarded also to the highest scoring novice class operator in the CW sprint only, provided that this entrant is not entitled to another award for the CW sprint.

The reasoning behind the concept of the Australasian Sprints is simple. Most contests are long with fairly complex rules, and participation, except by serious contestants, is tending to diminish. The Australasian Sprints, being of only one-hour duration, are quick and simple, challenging but fun.

Object of the Sprints

The operator's basic goal in the sprints is to make (and SWLs to hear and log) as many contacts as possible, without duplication, during an hour of operation on a single band. Any contact with a VK, ZL or P2 station on 80m during the contest period can be counted, but a station may be claimed only once.

Eligibility

The Australasian Sprints are open to all licensed amateurs, or groups of amateurs using a single callsign, eg club stations, anywhere in the VK, ZL and P2 call areas.

Contest Period

1200 to 1300 UTC, 6 July 1991 (CW only)

1200 to 1300 UTC, 13 July 1991 (phone only, any legal mode).

Frequencies

For the CW sprint, frequencies between 3.500 and 3.700MHz may be used.

For the phone sprint, frequencies between 3.535 and 3.700MHz may be used.

Contest Call

CQ sprint or CQ test or CQ contest

Exchanges

Minimum exchange for a valid contact will consist of a 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), callsign of station worked (both callsigns for SWLs), report/serial number given and report/serial number received. Each log must be accompanied by a cover sheet showing the name and date of the sprint (CW or phone). The total number of contacts claimed, and a statement that the operator(s) has abided by the rules and spirit of the contest. This cover sheet is to be signed by the operator(s) and personal callsigns added where multi-operators enter using a club callsign. Any special conditions such as QRP or mobile operation should be mentioned in the statement.Any comments you wish to make will be welcomed by the sponsors.

Logs are to be in the hands of the AHARS, PO Box 401, Blackwood, SA 5051, attention Contest Manager, no later than Friday, 16 August, and the envelope is to be endorsed CW, Phone or SWL Sprint.

Awards

Certificates will be awarded to the highest score in each VK, ZL and P2 call areas for both the CW and phone sprints. Trophies will be awarded to the outright winners of both. A certificate will also be awarded to the highest scoring novice class operator in the CW sprint only, provided that this entrant is not entitled to another award for the CW sprint. Certificates may be awarded to other operators whose performance was, in the opinion of the sponsors, exemplary.

SWLs

Certificates will be awarded to the highest scoring listener log in the VK, ZL and P2 call areas for both the CW and phone sprints.

Any entry which is clearly in violation of the rules or spirit of this contest, 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 Adelaide Hills Amateur Radio Society Inc in respect of the interpretation of these rules, the granting of awards and disqualification will be final.

These contests are recommended as a good Saturday evening entertainment. If you have never entered a contest before, here is a good, friendly time to start. Join in and enjoy the fun.

David Box VK5OV
Contest Manager, Adelaide Hills ARS

VK Novice Contest 1991 Rules

Contest Period

From 0800 UTC 22 June 1991 until 0800 UTC 23 June 1991

Objects of the Contest

To encourage participation of amateur radio stations in Australia, New Zealand and Papua New Guinea, with special emphasis on contacts with novice and radio club stations.

Stations Eligible

Only stations in VK, ZL and P2 call areas may enter. No stations outside these call areas are permitted to be worked or entered in a log for the purpose of this contest. Except for club stations, no multi-operator working is allowed. Stations in the same call area may contact each other as well as stations in other call areas.

Contest Bands

All operations must be confined to within the novice frequency sub-band allocations in the 10, 15 and 80m bands. No cross-band operation is permitted. Novice allocation VK HF; 3.525-3.625MHz, 21.125-21.200MHz and 28.100-28.600MHz.

Modes of Operation

Only phone or CW may be used. In the CW mode, operation must not exceed 15 words per minute.

Contest Sections

Section (a) phone — novice/full call
Section (b) CW — novice/full call
Section (c) SWL

Scoring

For contacts with a novice station
— five (5) points
For contact with a club station
— ten (10) points
For contact with a full call station
— two (2) points

Listener Section

For novice to novice contacts
— five (5) points
For novice to full call stations
— two (2) points
For full call to full call stations
— two (2) points
For any contact with a radio club
— ten (10) points

A listener (SWL) entry may log only ten (10) sequential contacts made by a station, and then must log no less than another five (5) stations before logging that station again. The five (5) stations so logged need a minimum of one contact only logged

For phone stations, call CQ Novice Contest.

For CW stations, call CQ N.

Contacts

Any station may be contacted TWICE per band, provided a period of at least 12 hours has passed after the first contact.

Number Exchange

Section (a), on phone. Stations must exchange a serial number comprising an RS report followed by three figures. The figures must commence at 001 for the first contact and increase by "one" for each further contact.

Section (b), for CW stations. As for phone, but the report is an RST followed by the serial number.

Log Entries

Each log should be laid out so as to provide columns in the order given as follows:

Date/time UTC. Band. Mode. Station contacted. Report and serial number sent.

Report and serial number received. Claimed score. Each log sheet must be endorsed at the top "VK Novice Contest 1991".

Total claimed score for each page must be shown on the bottom of the page.

Front Sheet

A front sheet must be attached to the contest log and must carry the following information:

Name and address of operator. Callsign. Station location. Section entered. Score. Declaration. The front sheet must also carry a declaration which states — I hereby certify that I have operated within the terms of my licence, and the rules and spirit of the contest. This declaration must be followed by the signature of the operator, with date. In the case of a club station, the entry must be signed by a responsible officer of the club committee, or a licensed operator delegated by the committee to do so. In the case of multi-operator stations, the callsigns of participating operators must also be shown on the front sheet.

Regulations

All stations participating in the contest must be operated within the terms of the station licence and applicable regulations.

Entries To

Entries must be posted so as to reach the Contest Manager no later than 26 July 1991. The address for entries is: Novice Contests Manager, WARC, Box 1, Teralba 2284.

Certificates

Certificates will be awarded to the top scoring stations in each section at the discretion of the Federal Contest Manager.

Certificates will also be awarded to the top scoring novice station in each call area and to any other entrant where meritorious operation has been carried out in the opinion of the Contest Manager.

Trophies

The Keith Howard VK2AKX Trophy for the novice entrant with the highest aggregate (phone and CW) score, and the Clive Burns Memorial Trophy for the novice entrant with the highest CW score, are perpetual trophies on permanent display at the Executive Office. In each case, the annual winner will receive a suitably inscribed wall plaque as permanent recognition.

Provision is made for adjudication in the case of a tie.

Operator

A person may submit only one contest log per mode.

Logs for entries where an operator uses more than one callsign whilst operating in this contest will not be accepted.

Disqualification

The contest disqualification criteria as published annually in *Amateur Radio* will apply. Any station observed during the contest as constantly departing from the generally accepted code of operating ethics may also be disqualified.

Ken Miller VK2GKM
Novice Contest Co-ordinator ar

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169, MENINGIE 5264

All times are UTC

Six Metre Beacons

Due to a shortage of space this month the beacon list has been held over. Please refer to the December 1990 list which has not changed.

V73AT from the Marshall Islands has changed the frequency of his beacon/keyer from 50.090 to 50.035 due to interference — and has been heard by VK4ZJB on the new frequency.

John VK3ZJC, Chairman of FTAC, has asked me to solicit comments through these columns regarding further beacons on 50MHz. At present there are two, one each in VK6 and VK8.

John said that time-sharing is not presently possible due to the appropriate hardware not being available. Options are to have eastern states beacons on the same frequency as the other two or place them 1kHz either side of those two frequencies. Are there other options?

When I raised the matter some time ago, in some quarters there was a very cool reception to ANY further beacons on 50MHz due to possible cross-modulation and other interference problems. It was suggested Channel 0 in Toowoomba was enough beacon for anyone in the eastern states!

Any submissions should go to John Martin VK3ZJC, 3 Vernal Ave, Mitcham, Victoria 3132, or the Federal Office, PO Box 300, South Caulfield, Victoria 3162. A copy to me would be appreciated, please.

Six Metres

Did six metres die? Following the many exotic contacts from VK to other world countries last year, amateurs were heard to say that the band had given of its best for Cycle 22! Perhaps the "best" may be behind us, but there were still plenty of contacts to be made and many to new countries. We had the exciting openings to Europe during February and March, and since then the band certainly has not been dead.

During April the band opened to W on a number of occasions. On 17/4 around 2240 W6BJI was worked in VK2, 3 and 7. The openings extended to VK5 with good signals on 20/4 when W5s were worked between 2205 and 2400 by VK5NC, VK5DK, VK5EE, VK5RO, VK5NY, plus VK3OT and VK3LK, to mention a few. On 20/4 at 0640 Steve VK3OT worked ZS6AXT at 539, then at 0715 VK5NC, followed by VK5NY and VK3AMZ and possibly others, worked ZS4S. The next morning VK7IK worked W5s and was reported as having heard/worked PY5CC at 2350. VK3OT tried hard with PY5CC, but is not certain of the contact. However, at 2345 he was almost certain of a contact with LU7DZ via "side scatter" at 35 degrees, which was a very good effort. Steve also worked quite a number of W5s plus XE1GE and XE1DD and heard XE1IK and XE1KFM. Col VK5RO and Roger VK5NY worked XE1GE twice. Col also worked W5GVE at 2304, K5UBI and 2330 and 3D2ER at 2345. During these two days, V51E from Namibia was being heard in VK2, 3, 4 and 5 areas,but so far no definite reports of being worked. Lots of VK CW being heard on backscatter throughout the day. 21/4: After the morning (UTC) openings the day was relatively quiet. A few JAs plus KH3AE to the east coast and later at 0940 to VK3OT. At 1100 a big strong signal opening to JA via evening-type TEP. At 2355 VK5RO and VK5NY heard PY5CC. On 22/4 VK8GF S9 at 0945 said he worked ZLs, A35, V73 and HL5 on 21/4.

Refer to South Africa for 27/4. 28/4: From early morning VK5RO, VK5NY, VK5ZDR, VK5LP, VK5NC, VK5DK, and probably others, were involved in working some of the following: P29, V73, FK8, ZL, 2R, W5, DU3, AH0, XE and JA. Steve VK3OT was able to add 3D2, V63 and FO5 to the above list. In fact, from 32 W contacts, Steve worked 10 US states that morning between 0110 and 0324! Some W stations were S9 in VK5. 29/4: 0012 3D2PO 5x9 said he had worked XE1GE plus more than 70 VK stations during the morning in VK2, 3, 4, 5 and 7 areas. 0038 KG6DX 5x5 with heavy flutter; 0118 V73AT 519, 0130 masses of JAs at 5x9 and still there three hours later; 0404 AH6LE 5x7; 2229 YJ8GP 5x9 2320 VK3AMZ reported having worked ZP6BW in Paraguay on 50.133. Many ZLs on backscatter. So the band had died, eh?

South Africa etc

After a wait of many years, South African stations were worked over widespread areas of Australia. The activity started on 19/4 when JAs were heard calling South Africa around 0700. At 0705 Col VK5RO worked ZS6XL at 559 CW and again at 0712 on SSB. (Col said it was 10 years and within 10 minutes to the day since he last worked ZS6 crossband during Cycle 21). Roger VK5NY from 0725 worked ZS6AXT, ZS6XL, ZS6WB and ZS4S. VK5LP heard all four ZS stations, but they were very weak. At 0748 ZS6WB peaked at 5x5 for 15 seconds, and although I called him I cannot be sure of an answer due to heavy QRM from JAs. According to John VK4ZJB some or all of the four ZS stations were worked by VK4s APG, KJL, PU, ZAA, ZAZ, KHZ, BJE, ASO and ZNC. VK4BRG, VK3OT, VK2BBR and other VK2s and VK3s were there, plus a VK1. The ZS stations were still audible very weakly around 0840 when KH6IAA and KH6JJK were worked at 5x7 with the beam on South Africa. VK5RO worked KH6IAA and 3D2AG. Hugh VK5BC was away fishing and later told on 40 metres what he had missed!

27/4: 0615 VK6RO, VK6HK and VK6JJ worked 7Q7JA in Malawi — signals 529. 7Q7JA heard by VK5RO and VK5LP. At 0623 ZS6s into Perth again for the third successive day. At 0717 the Namibia beacon V51E heard in Perth. 0746 VK6RO reported A22BW from Botswana. At 2330 VK4ZJB, VK4ASO and VK4APG worked AH6JJ/AHO.

Sarina — North Queensland

Ron VK4BRG has again written an interesting letter with details of his Standings List and more exotic contacts, mostly for March. (* indicates new country) — 27/2: 0929 OZ8RW* Denmark, 0931 DL8HCZ, 0935 DL2PK, 0936 PA0HIP, 0937 PA2VSJ, 0944 DK6JL, 0945 PA0LSB, 0946 DJ4AX, 0947 ON4PS* Belgium, 0952 DK5UG, 0954 DL9GS, 1038 AH6Q/MM in PL49.

1/3: 0057 6W1QC, 0652 NI6E/KH6, KH6HME. 2/3: 2240 NL7OW followed by AL7C, AL7FH, KL7CDG, KL7IKV and leading to 2230 K8WKZ, 2337 WW8M, 2240 K0GJX, 2343 KA0KKO EN26, 2345 K8EFS EN72 — 3/3: 0006 KA0LEE (the last six contacts all in Michigan and Minnesota), 0024 AH6Q/MM RMO6, 0025, AH6AP Fairbanks, Alaska. 4/3: 2319 K0GUV, 2331, KA7VLH/O, 2355 K0GUV, 2356 KA0KIF, all EN26 Minnesota. 5/3: 0001 VE5UF* DO61, VE6JW DO33, 0946 NH6YG/KH3, 1022 NI6E/KH6, 1133 V73AT. 6/3: 2348 FO5DR. 7/3: 0801 KH6JEB, 0827 NI6E, 1018 KH6HH, 2337 6W1QC. 9/3: 2134 K6STI, 2154 NL7OW BP41, 2206 V73AT, 2223 ZLs. 10/3: 0056 TI2HL, 0820 NI6E, 2357 KL7Y RO91 in extreme west of Alaska. 11/3: 0659 KH6s. 13/3: 0701 NI6E. 14/3: 0656 KH6s. 15/3: 0043 6W1QC, 0755 NI6E, 1148 V73AT.

16/3: 2312 NL7OW, 2315 KL7NO. 17/3: 2317 6W1QC. 19/3: 0237 6W1QC, 0741 NI6E and again at 0919. 20/3: 2200 K6STI. 21/3: 0828 KH6s. 22/3: 0824 KH6s. 23/3: 0724 KH6IAA, 1148 JH1HAO/JD1* Minami Torishima. 25/3: 0700 KH6IAA, 2127 to 2202 nine W6s, one W7 Arizona, 2356 KG6UH/DU1*. 26/3: 0045 TI2KD, 0101 K6STI, 0112 N6CW, 0117 TI2NA, 0129 TI2HL, 2143 TI2HL, 2157 A35EM* Tonga, 2257 PJ9JT, 2306 HH7PV, 2340 FM5WD* Martinique, 2352 TI2HL. 27/3: 0044 NI6E/KH6, 0101 TI2NA, 0150 KH6NS, 0203 FO5DR, 0551 KH6s, 2056 to 2233 20 W6s and W7s, 2251 A35EM, 2311 KP4BZ* Puerto Rico, 2315 KP4EOR, 2340 K6GMV. 28/3: 0017 to 0039 two W6s and two W7s, 0129 NP4NP, Puerto Rico, 0131 TI2HL, 0139 KP4EOR, 0218 TI2HL and TI2NA, 0653 NI6E/KH6, 0714 KH4AE* Midway, 2112 two W6s and one W7, 2127 ZL0AAA, 2129 TI2NA, 2206 YV5ZZ, 2209 YV4AB, 2323 four W6s, 2337 FO5NK, 2346 K6QXY. 29/3: 0631 KH6s, 2226 N6XQ, 2327 P29PL, 2354 KB6SL/CE3 CW scatter via KH6 area.

Ron said there have been constant openings to Japan and these have not been included. He reports VK9YJ on Cocos Island has been "having a ball" and on 30/3 3D2PO worked ZS6, 9Q5 and 5H1 during the morning.

Ron concludes that six metres seems to be producing more and more contacts, but believes it will have to end before long. But, what a mouth-watering list Ron has produced — oh, to be living in North Queensland!

Brisbane

John VK4ZJB sends a summary of contacts he and others made in the area stretching from the Sunshine to the Gold Coast, which indicates what has been available in that area from the end of February to mid-April. The best day was 7 April, with many contacts being made using CW. KH4AE was running 2.5 watts to a five-element beam, and plans to lift the output to 175 watts in the near future. No dates or times are given as it is an overall summary only. 27/2: OH2TI, OH2BC, OH2HK, HL9XB, DL8HCZ, DK2PR, PA0HIP, DJ4AX.

March: KH4AE, AH6A/KL7, NL7OW, AL7C, KL7Y, FO5DR, V73AT, KG6DX, HL5BRQ, HL2IPL, JH1AMO/JD1, 6W1QC, HL9KB, NH6LT, K6STI, K6QXY, N6CW, AA6TT, W6SJR, A35EM, FM5WD, KP2A, PJ9JT, KH6NS, W6UXN, AA6TT, WA7BPN, WB6BMS, WA7JTQ, K6FV, N7AVZ.

To mid-April: KL7NO, K6QXY, ZL3AAA, HH7PV, FO5NK, TJ2BR, YS1ECB, PJ9EE, KG6UH/DU1, FO3BM, FO5LK, K6IVY, FM5WD, YV4DDK, KG6DX, ZL2TPY, KH4AE, VK9YQS, WA6BYA, K6PXT, N6AJ, W6PO, PJ9JT, YV5ZZ, A35EM, KP4EOR, NP4NP TI2HL, KP2A, V63AO, YV4AB, W6WXN, WA7CJO, WA7JTM, W5OZI, S9+40dB, W7RV, W5VY, W6XD, WB7ONF, KF7NP, WA7RM, WB4OSN, K1FJM/4, W7GZ, N7SJM, KO6JS, WA7FPO, K6STI, KB6VFC, AA7A, AH3HA, KH6HH, WA6LHD, FO3BM, HL5BRG, HL5BRQ, FO5DM, FO5BM, V73AT/B 50.035. On 28/4: ZK1CG, XE1GE. 29/4: W6, FO5, V73, V63, KH0, KG6, JA, P29, ZL, HL, KH6.

The contacts John made during the above period gave him his Worked All Continents and a score of 78 countries worked on six metres.

Tasmania

A letter from Maurice VK7SA provides information on 6m activities in southern Tasmania. 13/1: VK7SA and VK7IK at 2355 worked WB5FCR followed by K5UR.

9/3: Same stations at 2340 worked KL7Y. VK7IK worked as follows: 26/3: 2252 A35EM; 29/3: 0100 K6SBI; 30/3: 1045 V73AT, 1137 VK9YX. Also on 29/3 a good opening at 0200 to JA with activity from VK7s, ZIF, SA, IK and JWR.

5/4 provided one of the best openings to the west USA coast with K6QXY and WA6BYA being worked at 0050 by VK7s, IK, SA, KWR, AZ and ZBA. Signals were up to 5x9. VK7SA worked 8J8WUS at 2340 on 9/3 and queried where the station was located. This would be one of the new prefixes allotted to Japanese stations, as is 7LI reported by VK3OT.

Frank VK7ZMF in the central highlands has also been active on six metres.

Cocos Island

From 27 March to 2 April Peter VK9YJ operated from Cocos Keeling Island using a nine-element antenna (courtesy VK3OT) and a TS575. In 48 hours he worked 16 countries to provide him with Worked All Continents on six metres. In all he had 450 contacts on the band and the log included KP2A, 9H1GB, IT9LCY, FM5WD, 7Q7JA, YV5ZZ, KH6UH/DU1, HC2BI, NI6C/KH6, VS6MQ, V73AT, WA6EMV, NH6YG/KH3, 4S7AVR, ZC4MK, PJ9EE. Many JAs were worked. Peter worked easterly to South America and westerly to Africa, thus "circumnavigating" the world! Info from VK3OT and the Geelong Amateur Radio Club newsletter.

National UHF Field Day

This event was won by the Geelong Amateur Radio Club VHF team from Mount Cowley with a score of 6436 points. According to their newsletter, overall support from other teams for the event was poor, and there is a danger that the event may be modified or even cancelled.

Rockhampton

Lyn VK4ALM has sent in his Standings List and added that March/April in the Rockhampton area has produced contacts with KH4, AL7, 6W1, FO5, V73, JE etc, K6, TI, PJ9, HH7, KP4, YV4, FM5, KG6, KG6/DU1. After almost 30 years, these contacts have allowed him to obtain WAC on six metres. Lyn was very impressed that it became possible to work Europe — an event many thought impossible not so long ago. Lyn's present lament is that so far he has not been able to work 3D2! (I know the feeling — I have not been able to work 5W1 ... VK5LP).

Six Metres Standings List

So far there has been a relatively slow response to my request for confirmed information for inclusion on the present list. Graham VK6RO was the first to respond and, amongst others, I have received an extremely well presented entry from Lyn VK4ALM. In his case, he has opted to have two licensed WIA members verify his confirmations.

For the next listing in August, all present and any new entries will be shown in the form used in the past. For the February 1992 listing those who have verified their entry will be designated in a way yet to be decided.

Germany

Steve VK3OT reports that 600 amateurs in Germany have been given temporary permits to work six metres while the authorities try to resolve what is required for the future.

Cairns

By the time you read this, Channel 0 television should be off the air in the Cairns area, after concluding its period of co-channel operation with UHF. This will free that area for 6m operation.

(On the subject of Channel 0 it is disap-

pointing to learn that, contrary to departmental policy, the commercial Ch 0 in Tamworth will continue to operate on VHF instead of going to UHF as has the ABC).

Japan on Two Metres

On 13/4 and 14/4 JA6s were worked by Jeff VK8GF and others in Alice Springs between 1045-1105 and 1040-1105 respectively. Signals were up to S9 with SSB on 144.100 and FM on 145.000, but readability was a problem. Mike Hastings VK4BFO, in Mount Isa, wrote to say that on 15/4 he worked JI7DMB at 1040 on 144.100, sending 539 and receiving 559. Mike runs 100 watts to a 13-element horizontal yagi. He said the distance was 6740.3km and 134km further than the previous record. Whether it is further from JA6 to Alice Springs than JI7 to Mount Isa no doubt will be determined in due course, and therefore indicate who holds the record.

Melbourne

Ron VK3AFW has written regarding Melbourne activities on bands higher than six metres.

Aircraft enhancement contacts have been made with VK1BG on 2m and 70cm on Sunday mornings and tropo 2m CW to VK7ZHA during weekday mornings. On 30/3 Ron worked VK1AU on 144.200 via aircraft enhancement for the first time.

Following a large sun flare on Saturday 22/3 the solar noise made contacts to VK1BG difficult, and auroral reflections were observed between VK3AFW and VK7ZHA. The noise was still evident on the Tuesday morning skeds between VK3AFW and VK7ZHA. Charlie VK3BRZ called with a signal difficult to recognise. It was found signals peaked towards the magnetic pole, unlike evening auroral signals which usually cover a broader spectrum. The Mount Gambier beacon was stronger via the auroral path than direct.At 2225 Roger VK3XRS was contacted with both beams pointing south, as did Arie VK3AMZ. The enhanced conditions were fading by 2300.

Ron VK3AFW makes the comment that it was unfortunate there were no VK5s or ZLs around. The path length into southern ZL is not much greater than into East Gippsland from his Oakleigh location when propagated by an aurora. VK1, 2, 6 and 8 might have been possible, as the visual aurora was seen as far north as the Blue Mountains.

On 3/4 at 2223 a successful contact with VK7ZHA on 2m led to an attempt on 70cm, but signals were too weak for a two-way contact. At 2239 Roger VK5NY worked Des VK3CY at 5x5, but no two-way to VK3AFW. At 1058 on 4/4 VK3AFW worked Trevor VK5NC at 5x4. At 2230 a 519 contact was made to VK5NY. On 6/4 VK3AFW worked Ian VK1BG at 5x3 on 2m and 5x1 on 70cm, Gordon VK2ZAB on 2m at 5x4, and for the first time, Eddie VK1VP at 5x1 on 70cm. Later, Ian VK3AQU and Roger VK3XRS were worked.

The Home Scene

During April David VK5KK, Keith VK5AKM and Mark VK5AVQ spent a day working on my antenna system which had been damaged in a severe hailstorm, thus getting me back on 50, 144, 432 and 1296MHz. (The golfball-sized hailstones fell so heavily that they took chunks out of the edges of my concrete driveway and smashed more than 100 tiles on a neighbour's roof — I'm not kidding!). Over one of many cups of coffee, discussions centred on making use of my good location with VK5LP becoming operational on 2304MHz. I'll need more shack space soon!

For those who may wonder when do I operate on these higher frequency bands, as I am not often heard, the answer is simply that I am still in a recovery situation, and some nights I am in bed soon after 7.30pm, but as I improve there will be more activity!

Closure

April was a busy month for many 6m operators, but exciting for the number of new countries worked. No doubt there will be some tapering off in contacts until the next equinox.

Closing with two thoughts for the month: "Most people quit smoking in two stages — first they give up their cigarettes, then they give up yours", and "One advantage of modern art is that you can answer the questions the children ask about the nudes".

73 from The Voice by the Lake

Late Items

22/4: Col VK5RO and Roger VK5NY attempted a contact with PY5CC at 2355, but QRM on the frequency prevented a two-way contact. PY5CC was first heard at 2245. 26/4: Apparently a good opening from ZS6 into VK6 — no details so far. V51E also worked in VK6 around 0800. 30/4: 2239 3D2AG 5x9. 1/5: 0050 KG6DX 529 with flutter; 0102 KG6UH/DU1 5x3 to VK5NY, VK5RO, VK5NC and VK5LP to give me a new country. 5/5: Between 0245 and 0300 VK3AMZ and VK3OT worked W7s on what seemed a dead band.

Every now and again six metres turns up something special. Such an occasion was on 8/5 when, in response to a telephone call from Steve VK3OT, I was able to work Bill Tynan W3XO/5 at 0029 with signals 5x5 both ways. Bill and I had been hoping for such a contact for many years, and at last it eventuated. Bill writes the "World above 50MHz" notes for QST and we have been swapping information for years. The band was open to VK5 from that small portion of Texas for less than 10 minutes, and I also worked W5OZI; one other W5 escaped me. Who said the band had died! Bill was also worked by VK3OT, VK3LK and possibly others.

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HOW'S DX

Stephen Pall VK2PS
PO Box 93, Dural 2158

As I write these lines, news is to hand that the latest cyclones claimed hundreds of thousands of lives in Bangladesh.

Damage runs into hundreds of millions of dollars, and television programs show graphic pictures of the devastation. Communication lines are interrupted. Normal life came to a standstill. Human misery, despair everywhere.

In other countries of the world, when nature lashes out and shows its power, the radio amateur service springs immediately into action to assist in re-establishing communication lines. The Mexican and Armenian earthquakes, Hurricane Hugo and, not long ago, the Newcastle earthquake in our own country, were events where the radio amateur spirit of research, experimentation, practical application of knowledge and desire to help greatly assisted the authorities in their emergency relief work.

What a pity that successive governments, for the past 10 years, banned amateur radio in Bangladesh!

South Pacific and VK2GJH

Jack Haden VK2GJH (QSL with appropriate reply envelope and return postage to: PO Box 299, Ryde, NSW, Australia 2112) is on a two-months Pacific tour. He was active from the club station of C21NI in Nauru until May. Most of his time will be spent at his home in Tarawa, Western Kiribati, and he will use his local callsign of T30JH. Time permitting, he might go to Banaba Island and operate as T33JH. Jack checks into various nets quite regularly — 14222kHz at 0530 UTC and 14227kHz at 1100 UTC. During the day he can be found around (28520kHz, and in the evenings he often appears on the Pacific Islands Net on 14315kHz at 0800 UTC.

Bangladesh — S21U

For events leading up to this DX activity, please refer back to the May issue of *AR*. Jim VK9NS, despite the difficulties and restrictions imposed on him by the Bangladeshi authorities, managed to have approximately 600 contacts, all on SSB, and mostly on the

14MHz band. It was a frustrating time for Jim, with only about 2½ days' operation in 30°C conditions. The religious festival of Ramadan was still in progress, and office and other official activity ceased at 3pm local time. After receiving his operational licence on Tuesday afternoon, it took him almost the whole of Wednesday to have his equipment released from bond. He could not use the beam antenna left there a year ago by the Japanese operators.

All Jim found was a pile of aluminium tubing, with nuts and bolts missing here and there. Contrary to previous reports that he used a vertical antenna, he used a multiband dipole and a TS440S, and all the time he was monitored by his "assigned" assistants. QSLs to be sent to JA1UT. Should you be unsuccessful getting your card from JA, you might re-QSL directly to Jim as from mid-June. Send reply envelope and return postage cost (Norfolk has its own stamps) to J Smith, PO Box 90, Norfolk Island 2899.

Bhutan — A51

Bhutan was supposed to be on the bands from early May. However, at the time of writing there is no news about the start of operation. And we are well into May, Jim VK9NS and Kirsti VK9NL left for Bhutan on Sunday 28 April. They intended to stay there for two weeks and be active on all bands and all modes, especially on CW. Jim sent ahead an amplifier, beams and RTTY gear. Friends all around the world hope that Jim and Kirsti were not caught up in the aftermath of the devastating cyclones in Bangladesh, where they had to tranship for Bhutan. QSL direct to VK9NS.

United Kingdom — M0

To celebrate the 200th anniversary of the birth of Samuel Morse, affiliated clubs of the RSGB used the very special callsign: M0RSE from 9 April to 30 April 1991. Naturally, they were active only in the CW mode. QSL via the RSGB HQ.

Future and Past DX Operations

G4BZP Larry will be in Burundi for eight weeks beginning 6 May, and requested and hopes to get permission to operate and use the callsign 9U5BZP.

F6BFH advised that several French amateurs activated Ushant Island (EU-65), the most extreme western part of France, off the city of Brest. The callsign used was FV6OST. QSL to F9IE.

John KB5LRO/KH9 was active on Wake Island from 16 April for 10 days. QSL to WA2NHA.

Ron ZL1AMO was active in the second part of April from Wallis Island as FW0BW. He was later joined by Katsu FW/VK2BEX. QSL direct only to ZL1AMO Ron Wright, 28 Chorley Ave, Massey, Henderson, Auckland NZ 1208. VK2BEX Katsu Asahina, PO Box 195, Killara NSW 2071.

Laci HA0HW is often heard on the longpath in VK with a very strong signal.

SY/DJ6SI Baldur was operating CW only from Mount Athos SV2/A for a few days late in April. QSL direct only with SAE and two IRCs or two green stamps, within six months, to his home call.

Alain F6ACT was operating in April/May from Madagascar as 5R8AL. QSL to F6HUJ.

Reports from the Soviet Union indicate, as related by Andy UA3AB, that Romeo, of Spratly and Afghanistan fame, is planning a DXpedition to Myanmar, formerly known as Burma. The rumour is that the legitimate "XZ" prefix will be on the air in June. Let's hope so... Does anybody have an idea of the magnitude of the pile-up which will be created?

The Japanese are getting more active in organising short duration DXpeditions. Not so long ago, they were on VK9X Christmas Island in the Indian Ocean, working almost exclusively JA stations. Another group was active as KC6/JF1VXB from Palau and as KH2/JK1XPK from Guam.

JG1DUN and JF1WQC were in Tahiti from 30 April until 5 May, and KH0/JA1HGY operated from the Marianas. FS/JA4RED, FS/JL1RUC and nine others were active from the French St Martin Islands.

The Souverain Military Order of Malta was booming into VK/ZL on 1 May as 1A0KM. QSL direct to I0IJ. Antonio Privitera, via Ceresio 34 I-00199, Roma. SAE and two IRCs or two green stamps.

At the time of writing, it was rumoured that Angola D2 will be activated by several Russian operators. Likely callsigns mentioned were: UT3UY, LY2DF, UT4UM, RT5UL and RT5UY.

Joe CE9GEW and Oscar CE2NVH/9 are both operating from South Shetland Islands. QSL to PO Box 74D, Punta Arenas, Chile.

WZ6C, who previously was active from ST4, arrived in Bangladesh on a work contract lasting several years. He is hoping to get permission to operate.

Don WB2DND operated as A61AD mid-May, and concentrated on the WARC, and 40, 80 and 160m bands. QSL to his home call.

Bering Island — 55°00'N and 165°15'E

Vitus Bering, a Danish explorer who served in the Russian Navy, discovered this island in 1741. During his other exploration voyages, he proved that Asia and America are separated by a 80km wide strait — later named after him. To celebrate the 250th anniversary of the discovery, there will be a Soviet-Danish DXpedition to this island from 27 July to 16 August, with about 12 to 15 amateurs from Russia, Denmark and other countries. A commemorative award will be issued. Operators known at this stage are: UA3DLT, UA3DPX, UA3DNV, RA3AUU, G0GWA and G0KPH.

Iota Islands and Bernhard — DL2GAC

A great supporter of the IOTA program (Islands on the Air), Bernhard spent six weeks in India and four weeks in the Solomon Islands group as H44MS, where he was active from Rennel Island (OC-127), Reef Island (OC-65) and New Georgia Island group. Later he will go to Nauru, Philippines, East Malaysia and Borneo and he hopes to be back in Germany by the end of May. Last year, on a more extensive trip, he made approximately 250 QSOs and finished QSLing those QSOs by the end of December. QSL direct to his home call DL2GAC or via the DL Bureau. Incidentally,

the IOTA frequencies are as follows: 14260, 21260 and 28460kHz.

St Peter and Paul Rocks — PY0

Finally, after months of preparation, the "Natal DX Group" was able to land its expeditioners on this inhospitable rock formation east of Brazil in the Atlantic Ocean (0°-9"N and 29°-3'W. On 5 May we heard that at 0030 UTC the group was 15 miles offshore. By 6 May the operation was in full swing. The signals came over the North Pole and were 55 in Sydney. Quite a number of VKs were the lucky ones to work them. The group hopes to stay there 10 days, be active on all bands on SSB and CW, and expects to make 20,000 contacts. QSL with donations (See Feb '91 *AR)* to PS7KM Karl Mesquita Leite, Box 385, 59001, Natal, RN, Brazil, or to the "Natal DX Group", PO Box 597, 59021, Natal, RN Brazil.

Special Event Stations

Quite a number of special event stations operated in May.

EH5TCD was celebrating the 100th birthday anniversary of the Spanish tenor Cortis.

VI91AG was celebrating 200 years of Morse signalling (in the "SSB mode") from the old telegraph station near Alice Springs, NT. QSL to the VK1 QSL Bureau.

VI3AHY celebrated 100 years of local government in the Yarrawonga shire. QSL via the VK3 QSL Bureau.

4JOQ was operated from Zone 19, Eastern Siberia. QSL to Box 50, Riga 226010, Latvia, USSR.

VK5KL was active from 17 to 20 May, during the Kernewek Lowender (Cornish Festival) held in the South Australian towns of Kadina, Wallaroo and Moonta.

4U6ITU was active from Geneva on 2 and 3 May operated by Paul I1RBJ and his father I1RB.

8N6ARL was active during May from Okinawa, celebrating the JRRL annual meeting which was held this year on that island.

TP5OK. The Council of Europe Radio Amateur Club celebrated the admission of the new member state Czechoslovakia into the Europe Council.

VI75CUB celebrates 75 years Cub Scouting activity in NSW. QSL to the VK2 Bureau.

Interesting QSOs and QSL Information

Note: Callsign, Name, Frequency, Mode, UTC, month of QSO.

9L/DJ1RL-Theo-14012-CW-0910. QSL to Theo See, Breulgasse 13, D, 6457, Maintal 2, Germany.

H44VU-Heiko-14003-CW-0500. QSL to DL4YAH Heiko Halfmann, Kolpingstr 14, D-4358, Haltern, Germany.

3D2QB-21004-CW-0100. QSL to SM3CER, Jan Eric Rehn, Li sataet, 18. S-86300. Sundsbruk, Sweden.

YS1DRF-Richard-14001-CW-0300. QSL to W2PD Saul Slonim, 320 Rose St, Massapequa, NY, USA 11762.

TF3DX-Villi-21004-CW-1126. QSL to Box 1058, Reykyavik, Iceland or via the Bureau.

VP5VDT-Rick-21038-CW-2101-Mar. QSL to Bureau or to W4OVU Bruce P Phegley, 3940 NW, 4th Court, Coconut Creek, FL 33066 USA.

FM5BH-Laurent-21009-CW-1110-March. QSL to F6HEQ Jean C Blot, Rue Du Dr Roux, F 78390, Bois D'arcy, France.

FP/KH2I-Takuro-14222-SSB-0637-March. QSL to JK1KRS Takuro Tsuda, Box 27, Narita, Chiba, 286-91 Japan.

9M8ST-Siong-14196-SSB-1052-March. QSL via Bureau or 171D, Cookes Drive, 93150 Kuching, Sarawak, Malaysia.

V85FC-Chang-14006-CW-1250-March. QSL to PO Box 1311, RSB 1913, Brunei.

KB6QE/KH0-Hugh-14227-SSB-1226-April. QSL to Hugh Franklin, PO Box 209, Saipan, 96950 USA.

V85EB-Brian-21205-SSB-0528-April. QSL to G0AWF: RSG Snow, 21 Wheatfields, Whatfield, Ipswich, Suffolk, 1P7 6RB UK.

CN8NS-Said-1422-SSB-0622-April. QSL to PO Box 6577, Rabat, Morocco, Africa.

9X5SW-Wolf-21205-SSB-0538-April. QSL to c/- Deutsche Welle, PO Box 420, Kigali, Rwanda, Africa.

HI3ADJ-Genoveva-14222-SSB-0601-April. QSL to Genoveva De Bonillo, Box 3, Santiago De Los Cabarellos, Dominican Republic.

TU2XZ-Kuma-14222-SSB-0649-April. QSL to BP 3862, 01-Abidjan, Ivory Coast, Africa.

RTTY News

Syd VK2SG is back in his familiar surroundings and is providing, as always, an interesting cross-section of RTTY activity.

* 5T5/DK2XN-14083-0745Z. QSL to DK2WV.
* J6LOE-21086-2156Z. QSL to Box 307, Vieux Point, St Lucia, West Indies.
* 4K2FJL-14079-1006Z. QSL to W6MKB.
* YS70B-21089-1350Z. QSL to callbook address.
* VP8AWU-28084-1256Z. QSL to 1991 callbook address.
* TJ1MR-14089-2318Z. QSL to F6FNU.
* 4L0DXC-14085-0632Z. QSL to UT5HP, Box 1, Schastie, 348903, USSR.
* YN1CB-14084-0322Z. QSL to PO Box 3733, Managua, Nicaragua.
* 9Y4DG-14084-0443Z. QSL to WA2NHA.
* 9Q5BG-28085-1600Z. QSL to F5JT.
* EA9TL-21092-2039Z. QSL to PO Box 91, melilla, North Africa via Spain.

From Here and There and Everywhere

Jarmo OH2BN as QSL manager for the 1990 Jarvis Island Expedition, reports that all direct QSLs for AH3C/KH5J have been processed, and Bureau cards are being done now. He says further that he no longer will be involved with amateur radio, and all those needing Jarvis cards are advised to write to Martti Lane OH2BH, to Nuottaniementie 10-D-20, 02230, Espoo, Finland.

Hartmut 9X5HG has not been active lately. He was on holiday in Germany.

FT4WC on Crozet Island can be heard on 14160 at 1900 and 2100 UTC in list operations, and on 28510 around 1500 UTC and on 21270kHz at 1530 UTC. You have to be a night-owl in VK to work the station.

If you heard YQ3R, it was a special event station from Romania. QSLto YO3CD.

During a QSO with CU2AT, he said that in the past the Azores amateurs had some problems with the central QSL bureau in Portugal. As a result, the Azores now has its own QSL Bureau, PO Box 211, St Miguels Island, 9502, Portugal.

Alain F6BFH, QSL manager for various French stations, is a telephone card collector and he prefers phone cards (used) instead of IRCs or green stamps as payment for return postage.

"The Traveller's Net" is a contact point for all those who travel on land in VK and in Australian waters. The net is active every day at 0300 UTC on 14116kHz. The net controller and his assistants are: Roy VK6BO, Peter VK6HH, Bob VK5RI, John VK4MX, Andy VK3CAP, Alex VK3BMS, Edgar VK2EDM and Roy VK2IV. For novices, there is a similar net under the banner "See Australia First" on 21185kHz at 2300 UTC and/or at 0400 UTC. Net controller is Ross VK6DA.

VP2EXX advises that he now has a new QSL manager for all his past and present operations: KC8JE.

A reciprocal operating agreement covering amateur radio operations has been signed between Thailand and the United States.

Carlos CO6CG has a lot of problems with the incoming overseas mail. Please do not send him green stamps as return postage, only IRCs. Please type the address on the envelope; do not show callsigns; and, instead of postage stamps (if possible) use a franking machine sticker obtainable from bigger post offices.

The DXCC committee has approved the following operations for the DXCC Countries List: ET2A Ethiopia, S20VT (April 1990) Bangladesh, SV2RE/A Mt Athos, SV2UA/A Mt Athos, SV2ASP/A Mt Athos and SY/DJ6SI Mt Athos. The total of DXCC countries is now 322.

ZS8MI is now QRT, but in six months' time he is expected to begin operations from Gough Island, ZD9.

HR1LW was Yoshi operating from Honduras. QSL to JA1LW or via the JA QSL Bureau.

Eric, who last year was active as 3D2EA, advises that he is now in VK2 and it does not appear that this year he will go to 5H3 Tanzania.

CE0ZVS is a new station on Juan Fernandez. QSL to CE3PVS.

FOC call on CW, it did not refer to French Oceania. Rather, it was connected with the activities on the FOC Club (First Class CW Operators' Club), commemorating the 200th anniversary of the birth of Samuel Morse.

Dieter, who in 1989-1990 was very active as TL8WD, has a new call, ZL2QB.

John XQ0X left St Felix Island in April. There is no news of any future activity from that island.

If you worked 3DA0BK, he was Franz Taschl, PO Box 122, Eveni, Swaziland, Africa.

R4CG was a special call in memory of Yuri Gagarin, first man in space. QSL to RA4CC.

Gus 9Q5TE should be active again in June. By that time he will be back in Zaire, after a well-earned holiday back home in Sweden.

Al 9K2CS of Kuwait has attended the Dayton Hamfest at the end of April.

As promised, Bing VK2BCH has reappeared on the bands from Rotuma as 3D2XV. QSL to home call, direct only, with SAE and return postage.

It is my belief that if I receive a QSL card from overseas with an SAE and the corresponding cost of return postage, the sender of the card expects a reasonably quick answer to his request. I usually send back my card within 48 hours. To my surprise, a US amateur, who wishes to remain nameless, wrote me a letter of thanks for my speedy reply. I quote from his letter: "The contact was on 4 April, and your card was in my hand on 16 April; what a turnaround! The point of my letter is that, maybe as a DX editor of *AR*, you could influence some of your readers to respond to direct QSLs a little better." He enclosed a list of callsigns, among them well-known DXers, from whom he expects direct cards.

The waiting time, according to this list, is from seven months to just a little over one month. Come on, fellows... everybody understands a bit of a delay, but we can do much better than seven months or four months... What about cleaning up your overdue QSL replies ... ?!

QSLs Received

Note: W=week; M=months; Yrs=years; FM=from; Mgr=manager; OP-operator.

Direct cards: TF3DX (4W FM OP); TA2AO (5W FM OP); CN60MA (19W FM OP); V85EB (3W FM OP); VK0KC (4W FM MGR); SV2RE/A (5M FM OP); AA6LF/KH5 (10D FM OP); 5HOQL (2M FM MGR); 7Q7KG (2M FM MGR); ZS9/W6KG (MM FM MGR); 9U5QL (2M FM MGR); FY5EW (2M FM MGR); 9M8LL (4W FM MGR); 9M8FH (4W FM MGR); 9M8AJ (2M FM MGR); 9X5HG (2M FM OP); TI9CF (9M FM OP); 1A0KM (3W FM MGR); P4OV (4W FM MGR); 9Q5TE (3W FM MGR); BY1QH (8W FM OP); BV2CL (2W FM OP); XW8KPL (2W FM OP).

Thank You

As always, I am very grateful for the help and assistance received from: VK2DID, VK2SG, VK3DD, VK3JFE, VK4AI, VK4DA, VK4OH, VK5QW, VK5TL, VK5WO, VK9NS, CO6CG, DL2GAC, F6BFH, I0IJ, OH2BN, TP2CE, 9X5HG and the *QRZ DX, The DX Bulletin* and *DX News Sheet.*

Late News

Going to press, news has reached us that Jim and Kirsti are safe and well in Bhutan.

Ken VK5QW spent almost a full day trying to track them down. After many unsuccessful attempts, he was able to get a phone connection to Bhutan and spoke to The Chief Engineer of Wireless Division in Bhutan, Mr Sherab Dorji, who said that Jim VK9NS and Kirsti VK9NL are safe and well in Bhutan. Ken was unable to speak to Jim and Kirsti personally. Mr Dorji said that, for an unexplained reason, Jim and Kirsti were not granted permission to operate. The full story will probably be told when the Smiths return to Norfolk.

Good DX and 73

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

After what my log-book tells me is a break of nearly a year, I have managed to spend a little time in the shack actually using Morse code! So this really does seem to be the time to talk about the basics, and about the early learning times on air that all of us go through. Thanks, Marlene VK3WQ, for that contact, and I noted after the QSO that the last time we spoke was over a year ago when your callsign was VK3FML!

I have received a letter from David VK3DRG, which has some bearing on the subject, and he says:

"I have been licensed since the late '50s, but after about 10 years of being active, I travelled to various parts of the globe and never quite got around to setting up a rig. Am now back for good and getting organised. No rig as yet, but am listening around the bands. I used to have a reasonable fist and I feel that the requirement for Morse should be retained. Fourteen words per minute wasn't all that difficult years ago and I see no reason for change. But my morse is now very rusty so I'm back to listening to the slow morse and building up again. So I'm virtually in the position of the newcomer who tries his fist for the first time.

Listening to people calling on the low end of the bands, one finds that the majority give out with a CQ etc produced by some machine at a rate of knots. Only another very polished operator would go back to them ... or, indeed, be able to read them. Now these operators are the ones who should be making an effort to encourage others to use the key or whatever other devices take their fancy. If we can encourage the newcomers to use morse, we will build up more and more operators who will develop their own faster speeds as time goes by. But we have to let them in and talk with them at their speed. So I suggest that there should be a sort of gentleman's agreement that a general call should be at, say, not more than about 16wpm.

Once contact is established, then by all means speed up to a rate which is comfortable for both parties. It may well be that some of the experts might slow down once in a while and have a contact with a new operator, just to build confidence and give encouragement. Morse is to some extent a dying art, and if we want to preserve it, we have to try to build up the number of operators. How better than by having a contact with the less experienced operator at a speed they can handle, and so build their confidence so they can go on to being a really competent brass pounder?"

(David VK3DRG)

I am sure we have all had the same experience as beginners, but I also thought that there already was a "gentleman's agreement" covering the same circumstances, and that it was more or less common courtesy to slow down to the other operator's speed. Are you aware of this, and is it true?

I think we can understand that some operators may not want to slow down for some reason or another, but I always thought that it was good manners to reply to a call at whatever speed or if one's patience runs out, cut the QSO short in as polite a manner as possible.

Experienced operators will be familiar with many of the tricks for cutting a QSO short, and maybe it would be a good idea if you all wrote to me with some of your favourites, we could even have a competition.

Some that I am afraid I have used include having to go to dinner, QRN (which quite often is true), and even just falling asleep. One could go so far as to slowly turn down one's transmitter power and say that the band was closing! I know it is sometimes easy to get bored with a conversation, and it would pay all operators, whether beginners or experienced, to at least keep their overs short.

A few years ago there were a group of operators who regularly used full break-in during their rag-chews and nets. I don't know whether they have all disappeared, or whether I just can't find them, but it is worth the effort to master the procedure, especially as most rigs have full break-in (QSK) capability. I guess I am guilty of disappearing as well as not using QSK, and I will try to make a point of asking in future if the person I'm in contact with has QSK capability.

For those who have never used QSK and who might not even know what it is, I will give a brief description.

All will be aware that the code consists of dots and dashes separated by spaces. Suppose you can listen to the frequency you are transmitting on at the same time as you are sending, much as any other listener on the frequency can. You would be able to hear your own signals, and you could also hear if another station transmits at the same time. It is fairly easy to achieve the situation where your receiver listens between every dot and dash that you send. And, many operators use a form of QSK where the key operates the VOX with a suitable delay so that when one stops transmitting, the rig drops back to receive after a second or two. This is actually called "semi-break-in" and mainly saves one from having to manually turn the rig to transmit.

Technically, full break-in is a little more difficult to comprehend. The time intervals are so short that it is difficult to understand exactly what is happening. Bear with me as I try to explain.

Imagine that a dot has just finished and we are going to listen for a while before the next dot. What needs to happen is, the transmitter having just shut down, we have to turn on the receiver as quickly as possible, and have it come on at a pre-set volume, and at the right frequency. Then, when the next key press comes along, the receiver must be turned off, the frequency changed, and the transmitter turned on for the next dot. I won't go into too much detail with the timing of these actions, but it is critical, and it gave me a lot of headaches when I was building my 80m transceiver (from tx and rx kits).

If you are going to try full break-in for the first time it will pay to experiment with the various settings on your rig. I have no way of telling you how to adjust these settings, but with a bit of help from your instruction manual you shouldn't have any problems. The main thing to do is to have the volume of your side-tone and the volume of received signals about the same, or maybe a little less on your side-tone. You will need to experiment with the AGC settings which should probably be set to "fast" if you have the usual "fast, slow, off" option. It will make you more careful with your frequency setting, because you will find that hearing the same tone on receive and transmit is beneficial, and if you set up to do this, the frequency will be spot-on. Assuming the RIT is OFF, of course. If you are troubled with the noise from the rig as it switches (some click a lot!) try wearing headphones as well. Have I left anything out? Let's hear your views.

It is a lot of fun to work using QSK and can be extremely convenient for both sides of a QSO. Some operators (of whom, you will have guessed, I disapprove) ramble on and on, and one's house could burn down while waiting to reply. It is, therefore, both polite and convenient to be able to send a dot or two to shut him up, so that you can put out the fire without missing anything interesting. Am I being unreasonable? Or just thick, as usual? I guess I'll have to wait and see. If you happen to hear me on air, give a dot or a chirp to see if I'm listening between MY dots next time ... I just had a horrible thought for another knob on the rig, one that would dial in a bit of chirp for flavour!!!

ar

AMSAT

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON 5074
PACKET: VK5EA@VK5WI

```
        NASA 2-Line Keplerian Elements  (Set 124.AMSAT)

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00   0   0 BBBBB.BBBBBBBB  .CCCCCCCC  00000-0  00000-0 0  0DDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83 58  B 91121.60065856 -.00000148  00000-0  99998-4 0  6710
2 14129  25.8131 148.0591 6035385 238.5956  48.7305  2.05930413 31282
UO-11
1 14781U 84 21  B 91122.69224067  .00003170  00000-0  57549-3 0   104
2 14781  97.9005 169.0852 0010841 319.1087  40.9235 14.66845596382761
NOAA-9
1 15427U 84123  A 91123.10234242  .00000560  00000-0  32130-3 0  7778
2 15427  99.1703 135.5346 0014869 187.1460 172.9510 14.12986564329151
MIR
1 16609U 86 17  A 91122.53643102  .00041942  00000-0  40528-3 0  4473
2 16609  51.6051 168.9464 0008449 166.6966 193.4219 15.65973348298013
NOAA-10
1 16969U 86 73  A 91120.06912542  .00000949  00000-0  42827-3 0  8262
2 16969  98.5676 146.4917 0014660  70.1439 290.1318 14.24101472239707
RS-10/11
1 18129U 87 54  A 91122.55873330  .00000097  00000-0  99999-4 0  8356
2 18129  82.9239  92.6743 0010665 318.9430  41.0927 13.72181431193336
MET-2/17
1 18820U 88  5  A 91121.85361924  .00000196  00000-0  16501-3 0  5228
2 18820  82.5399  97.1296 0016834 143.9190 216.3113 13.84476200164277
AO-13
1 19216U 88 51  B 91121.30113593  .00000118  00000-0  99999-4 0  2712
2 19216  56.8390  97.0967 7167973 253.2812  22.8340  2.09698033 22040
MET-3/2
1 19336U 88 64  A 91121.83203236  .00000113  00000-0  27656-3 0  7746
2 19336  82.5434  51.9899 0015806 236.0518 123.9106 13.16923357132893
NOAA-11
1 19531U 88 89  A 91122.43824752  .00000628  00000-0  30859-3 0  5270
2 19531  99.0278  76.8911 0012935 108.9187 264.3410 14.12118579134016
MET-2/18
1 19851U 89 18  A 91121.69193723  .00000343  00000-0  29828-3 0  4744
2 19851  82.5268 334.6825 0014014 184.7378 175.3655 13.84130389109626
MET-3/3
1 20306U 89 86  A 91121.72427256  .00000043  00000-0  99999-4 0  3732
2 20305  82.5584 353.3394 0014933 253.1627 106.7957 13.15951988 72845
UO-14
1 20437U 90  5  B 91122.22417975  .00001104  00000-0  45135-3 0  3780
2 20437  98.6640 201.9252 0010286 302.6115  57.3972 14.29099943 66428
AO-16
1 20439U 90  5  D 91122.47208996  .00001024  00000-0  41897-3 0  2770
2 20439  98.6731 202.4976 0010865 309.3328  50.6876 14.29185843 66461
DO-17
1 20440U 90  5  E 91121.96499687  .00001157  00000-0  47064-3 0  2784
2 20440  98.6740 202.0372 0011782 310.4248  49.5835 14.29267592 66398
WO-18
1 20441U 90  5  F 91122.14653391  .00000930  00000-0  38140-3 0  2772
2 20441  98.6708 202.2637 0011394 308.1072  51.9081 14.29315082 66427
LO-19
1 20442U 90  5  G 91121.98343586  .00000926  00000-0  37882-3 0  2784
2 20442  98.6714 202.1569 0011916 309.2827  50.7277 14.29390739 66408
FO-20
1 20480U 90 13  C 91105.45830526  .00000074  00000-0  21687-3 0  1864
2 20480  99.0224  99.5356 0541696  83.6151 282.6307 12.83176352 55617
HUBBLE
1 20580U          91122.07137749  .00006445  00000-0  67935-3 0  4715
2 20580  28.4699  17.1623 0005104 200.3140 159.7237 14.87520086 56447
MET-2/19
1 20670U 90 57  A 91121.78331928  .00000507  00000-0  44578-3 0  2234
2 20670  82.5471  35.7673 0017070 109.0585 251.2405 13.83963660 42580
FY-1/2
1 20788U 90 61  A 91122.37577184  .00000008  00000-0  16849-4 0  1847
2 20788  98.9468 156.8504 0014546 304.0638  55.9151 14.01133746 33791
MET-2/20
1 20826U 90 86  A 91121.63624373  .00000363  00000-0  32087-3 0  1749
2 20826  82.5292 334.9235 0014404  16.0817 344.0784 13.83342130 29776
AO-21
1 21087U          91122.45492809  .00000283  00000-0  26809-3 0   729
2 21087  82.9387 267.5573 0036064  28.2952 332.0147 13.74379605 12748
RS-12/13
1 21089U 91  7  A 91121.52227182  .00000210  00000-0  21213-3 0   738
2 21089  82.9237 138.7019 0030979  50.5396 309.8488 13.73893673 11730
MET-3/4
1 21232U 91 30  A 91121.80821025  .00000005  00000-0  00000 0 0   123
2 21232  82.5448 257.2558 0016933 166.9752 193.1873 13.15981761  1011
```

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information Nets
AMSATAustralia
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday Bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz
(7.064MHz is the frequency presently in use)

AMSAT SW Pacific 2200 UTC Saturday, 14.282MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 340 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services, send a SASE to Graham.

From AMSAT HQ, 27 April 1991

UoSAT-F Combines Humanitarian Mission with Amateur Radio

UoSAT-F — now scheduled to be launched on 7 May — will support both amateur and non-amateur RF links. The satellite's primary non-amateur mission is to provide store-and-forward communications for SatelLife, an organisation formed by 1985 Nobel Prize winner Dr Bernard Lown. SatelLife will use UoSAT-F to start a non-profit electronic mail network for health professionals. Initially, five African medical schools will use "HealthNet' to exchange electronic mail and receive up-to-date medical literature. HealthNet is a direct application of store-and-forward satellite communications techniques developed within the Amateur Service.

When not serving HealthNet on non-amateur frequencies, UoSAT-F will transmit and receive on Amateur Satellite Service channels. It will transmit and receive AX.25 data

using 9600 bit/second FSK modulation. The uplink is on 2m, and the downlink is on 70cm. This is the same frequency plan and modulation used on UoSAT-OSCAR-14. Stations already equipped for UO-14 operation will be able to receive UoSAT-F with the same software and hardware they already use. Many of the 100 stations now active on UO-14 found the implementation of 9600 bps FSK much easier than expected, so newcomers shouldn't be frightened of this high speed technology.

UoSAT-F will transmit telemetry, status messages and files in the pattern typical of UO-14. Telemetry and status messages will be in the same format as that on UO-14, files will be broadcast using the PACSAT Broadcast Protocol. This protocol is already in use on PACSAT, LUSAT and UO-14.

UOSAT-F's role in the amateur satellite service will be similar to that of UO-9, UO-11 and WEBERSAT. Instead of providing a two-way communication service, it will transmit experimental data and telemetry. The most exciting aspect of this mission will be the charge-coupled device (CCD) camera. UO-F's CCD camera design incorporates all of the lessons learned from previous UoSAT CCD experiments. It has a wide-angle lens (110 degrees) providing a field of view only slightly smaller than the satellite's footprint. Images will measure 1600 by 1800km, making identification of ground features much easier than on previous cameras (UO-9 and WO-18). The image will be 578 pixels by 576 pixels, providing ground resolution on the order of 2km. Each pixel is eight bits, giving a black-and-white image with 256 levels of grey.

UO-F will broadcast CCD images routinely using the standard PACSAT Broadcast Protocol. The two Transputer microprocessors in the CCD camera module will take the image and send it over an on-board network to the main 80C186 onboard computer (OBC186). The OBC will put the image into a file, with 256 bytes of image header information and a standard PACSAT File header. This file will then be broadcast. For those interested in writing their own display program, complete technical details of the image file contents will be published soon. When we have confirmed that the camera is working, we'll release a display program for PC compatibles. (We'll actually distribute this software over the satellite using the Broadcast Protocol, "bootstrapping" ground stations).

The wide-angle, black-and-white CCD camera on UoSAT-F will complement the WEBERSAT camera. Taking advantage of the stable, Earth-pointing UoSAT bus and the 9600 bit/second downlink, it should provide very interesting results for experimental and educational users.

We will broadcast progress bulletins on UO-F's amateur downlink as soon as we have the Housekeeping Integration Task (HIT) loaded — probably on the first day of operations.

UoSAT-F Frequency Plan
Downlink
435.120MHz
9600 bps FSK
1200 bps AFSK (backup)
5W or 2W
Uplink
145.900MHz
9600 bps FSK
1200 bps AFSK (backup)

Note: This channel will be used by ground stations transmitting "hole lists" and requests for the PACSAT Broadcast Protocol. There should be little interference with the Microsat uplink on the same frequency.

73s from Maurie VK5EA

ar

For Feb/March Satellite activity please see P55

March IARU MS Summary 1991

Date	Time UTC	Frequency In kHz	Callsign if Heard	Mode	Logs X	Details of Traffic if Known and Any Other Information
0503	1200	7002	"V"	A1A	19	Beacon
0503	mni	7010	UMS	Vari	16	F1B/R7B various shifts on F1b
2103	1030	7014		Vari	4	Numbers tfc
2903	1005	7015		R7B		4kHz wide b/cast stn
0603	1350	7020		A3E	2	B/c SE Asian
2303	1223	7025		A3J		Asian voices distorted B/C stn
2703	1525	14003		A3	1	Foreign Telephony (no details)
dly	mni	14023		F1B	61	24-hr stn 250Hz shift/RYs
dly	mni	14028		NON	41	Carrier for telephone
0203	mni	14030+				This intruder is the same as on
14048 ... does a freq change						
1203	mni	14048+		A3J	27	R/telephone with tones
dly	mni	14051		J3E/L	36	Asian R/T
dly	mni	14058+		A2	64	24-hr dual TX
dly	1030+	14070	VBX	A1A	13	Traffic
1803	0615+	14072		A1A	3	UANZ/UCBN/EYMJ/all new (VRQ??)
dly	dly	14075+	VRQ	A1A	50	News B/c re Gulf war (Vietnam)
2303	0130+	14096	VPC	A1A	10	8FQ de VPC
2603	0900+	14100	NZB	A1A	14	Outside norm sked contact
0103	0706	14140		F1B	5	RTTY shift unknown
1403	0900	14120	***	A1A		Dly c/s change SHWR/QNAM/VDQC
1003	0700	14140.5	UUMS	A1A	7	C/c in CW. F1B various shifts
2103	1000	14200	VMO	A1A	7	Tfc only
2303	1000	14215	HSM	A1A	11	No further info — more pse
0403	0518	18070		PON		The new woodpecker is with us!
0103	1143	18080		A3E		Radio Moscow
0803	1305	18120		A3E		B/c in Eng/Foreign Lang lessons
dly	0200+	21032	UUMS	A1A	34	20 hrs/day Moscow NR USR
0103	0740	21283.5	UUMS	A1A	33	18hrs/day Moscow NR USR
0503	1124	21450	RMWS	A3E	15	Radio Moscow World Service USR
0303	0724	28980		A3E	7	B/c Ch talk/music. No ID

Logs from: VK2s 2EYI, 3CIS, 4BG, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 4EKA, 5TL, 6RO, 6XW, 6BEK, 6BWI and 7RH. On behalf of the Monitoring Service, my thanks. Gordon VK4KAL Fed Co-ord.

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER
WATCH CO-ORDINATOR
'AVIEMORE 'RUBYVALE 4702

Intruders QSY

Some notable intruders are vacating their usual illegal frequencies. It seems conditions do not favour them (which is good news), but we still will have to put up with them on another band. UUMS 7008 F1B and R7B signal appears now on 7010+/-, being 30 per cent of time on air. The RT station of 14048 is back after a sojourn on 14027/30. UUMS from 14140.5 has not been heard as much as previously, but 21032 is still as active as ever. Moscow Naval Radio runs RYs and leaves a carrier for about 18 hours a day on 21283.5. Many spurious and harmonic signals are heard in the 7.000 to 7.046 portions, from a variety of sources. Likewise, 14MHz has many more intruders using "home-brew" callsigns. A lot of non-amateur activity took place between 14060 and 14110MHz.

An upsurge of commercial broadcast stations took place on 28-30MHz. The greatest offender was Radio Moscow World Service (I certainly would like to see the WIA push for greater use of this band by novice operators and "K" calls, seeing that full calls are showing NO interest in using this vast area.

On 21450 we are again seeing the encroachment of foreign broadcasting into our legal band; admittedly only just inside, but if we do not get action going to curb it now, next year they could be all the way — so get down there on CW and pour your full legal power into them. **ar**

EMC

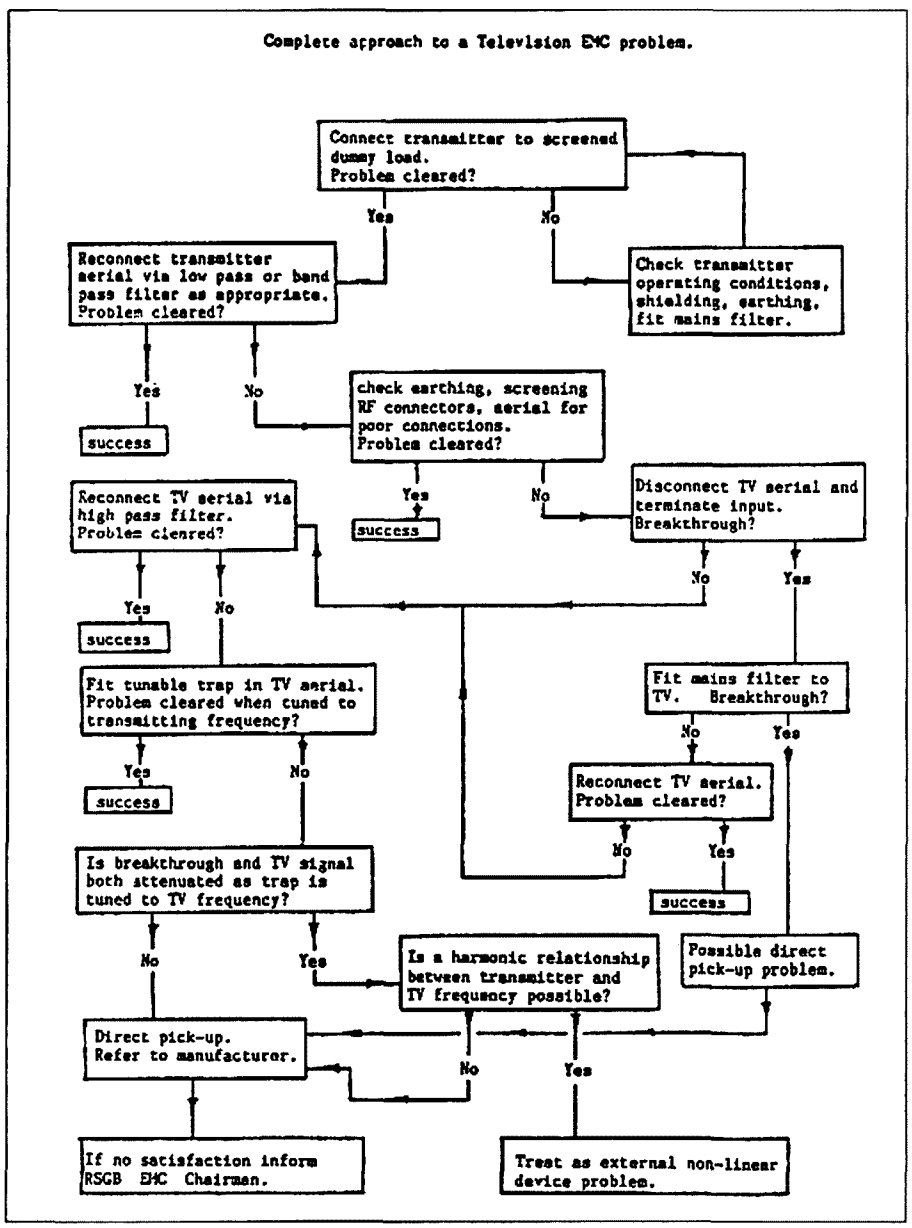
Hans Ruckert VK2AOU
EMC Reporter
25 Berrille Rd Beverly Hills 2209

1) *QST* reports on the attempt by some members of the US Congress to protect permanently by law the amateur-radio-frequency-spectrum (March 1991). This would solve forever the problems of interference by intruders, the struggle at the Geneva WRCs to retain amateur frequency bands, the interference caused by and to cable-TV companies and service operating on exclusive amateur bands (channel 6, 2m band), provided the frequency spectrum organisations of other countries follow the US example. Why not, when the authorities protect appliance users from the legal, but unpopular, radiation from amateur radio stations, caused by inadequate appliance design?

2) Radio amateurs, operating on VHF/UHF bands frequently observe severe interference from their own computers, and from those in their neighbourhood. The interfering pulses appear over the whole 2m band, often making OSCAR operation impossible. All ingoing and outgoing cables should be wound on ferrite cores to form rf chokes. If the computer comes in a metal case, earthing of the case may help. In the worst case, the computer may have to be placed in a metal box, which is earthed, and which encloses the computer as much as possible. Using a different AC power outlet for the receiver/transceiver and the computer in the shack can sometimes help, too. These steps have already been described for the VCRs, to reduce susceptibility.

3) Cable-TV contra amateur radio on the 2m and 70cm amateur band: *CQ-DL* 4/1991 brings a leading editorial report by Dr Ing H Schmücker DK5ML, vice-president of the DARC "Interference". The same magazine brings a 3½-page comprehensive paper with many literature references from several countries on the cable-TV interference problem. The frequency allocating authority "FTZ" (Fernmelde Technisches Zentralamt) is apparently inclined to believe the claim of the cable-TV companies that their system is RF-leakproof, because the government gains financially from this service, and more entertainment makes politicians popular. This was so 2000 years ago in Rome (bread and circuses!). When it comes to science and technology matters, hopes and beliefs are not good enough and often unreliable. The whole 2m band is affected by cable-TV-channel 6, also interfering carriers from FM-relay transmitters cause trouble on 433.05-433.79MHz. Cable-TV on the D2.MAC-Norm would be used, and interference on 28-29.7MHz is expected (amateur 10m band). The use of exclusive radio amateur bands is for the cable-TV companies only a commercial profit matter. The promise by the cable-TV companies that they will attend to interference cases sounds good, but experience has so far shown that unwanted leakage radiation, as well as penetration by the signals from other services, could usually not be sufficiently reduced to permit, for example, amateur satellite communication, where high receiver sensitivity and high transmitter ERP are required. The US experience with channel "E" on 145.250MHz has already shown some years ago that most leakage problems were due to low quality of the leaking coaxial cable going to the houses from the main supply cable along the road, and the use of low quality coaxial plugs at the TV sets. But, even improved installations at best merely reduced the worst interference. The DARC held a "Channel-6 Working Conference" at Gladbeck, because the densely populated Ruhr River industrial region is completely covered by cable-TV-channel-6. What could one do with the costly VHF/UHF equipment and antennas, if all capital cities are covered with interference from cable-TV? It could not be sold, being also useless to otherwise potential customers. The battle goes on in DL.

4) From *Radio Communication*, UK, April 1991 (submitted by Norm Burton): We know that the European Commission EMC Directive is better than nothing (present state), but it is only a limited step in the right direction, because experts have established than an immunity level of 10V/m in the test cell would be fully satisfactory, whilst Germany had in-



troduced 3V/m fieldstrength years ago, mainly due to the efforts of DL1BU and DL9TJ. Now the European Commission does not even request the level of immunity under test-cell conditions. The most amazing outcome of this is that there is likely to be a transition period of four years, ending on 31 December 1995. A large number of people in the electronics industry — who have not done anything to improve their products — would have applauded this announcement. What will happen during this four-year period?

5) Other paragraphs of this EMC Report by G4JKS deal with RF noise-cancellation methods, equipment performance and its limitations.

6) PCB-High-Pass Filter: Using printed circuit board material as the filter base and earth terminal, and the other side as capacitor electrodes, has the advantage that capacitor self-resonances, so often obtained with other capacitors (discs etc), are avoided. These filters can be effective even at UHF.

7) A Flow-Diagram showing the necessary step-by-step investigation to find the cause and remedy of TV reception disturbance is a most helpful guide, and is very much recommended.

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SPOTLIGHT ON SWLing

Robin L Harwood VK7RH
52 Connaught Cres West Launceston 7250

Well, we are in the middle of winter and already I have noticed a drop in the signal levels on the higher bands in excess of 17MHz. This is mainly due to the slow decline of the solar flux. Although there were some surprises in the latter part of April, with exceptional propagation on 50MHz. There were some epic QSOs between Australian hams and those located in the Pacific, North and Central America, Japan and Africa. Who said that six metres was dead!

Incidentally, there are going to be major alterations to the maritime HF allocations. Although the bands are largely unchanged, the position of various services within these allocations will alter. For example, the RTTY/SITOR signals will shift further away from the Radphone allocation. The 1995 deadline, when CW will be largely phased out, will see many coast station frequencies primarily utilising SITOR and other digital modes. So there will be fewer CW frequencies after 1 July. Also you will notice that the 25MHz maritime allocation will have many more signals than at present. Up till now, the only stations on that band have been in Scandinavia, yet the American coast stations, WCC and KPH, have been heard with marker signals and SITOR pulsrs.

Although much maritime analogue and digital traffic is being increasingly carried via satellite, the costs are still prohibitive for the smaller operators, who still prefer to use the cheaper and technically limited HF service, which is still prone to propagational disturbances.

I noted on a recent BBC "Waveguide" program that the BBC External Services uses 110 separate transmitters to radiate its programming worldwide. The same program informed that there is increased co-operation between the major broadcasters to share frequencies and minimise co-channel interference. Regular meetings are planned to co-ordinate seasonal frequency alterations. The recent Prague meeting saw broadcasters from East and West overcome some difficulties with co-channel interference. It is hoped that other regional broadcasters will also meet to make suitable frequency arrangements.

As you are aware, the need for such humanitarian organisations such as the Red Cross have been amply demonstrated in recent human and natural disasters, such as in Bangladesh, Africa and the USSR. The Red Cross Broadcasting Service has scheduled monthly test broadcasts to this area. They are as follows:

0740 to 0757 UTC on 9560, 13685, 17670 and 21695kHz on 27 and 30 May, 1, 4 and 29 July, and 1, 26 and 29 August. There is also a release between 1040 and 1057 UTC on the same dates on 13635, 15570, 17830 and 21770kHz. All of the above have been made available by Swiss Radio International. From 1310 to 1327 UTC, the service is on 7480kHz, but is from Radio Beijing. Senders in Moyabi, Gabon and Radio Bras, in Brazil are also used at other times.

Just after 0700 UTC on 6 May 1991, Australian Standard Frequency and Time Station, VNG, at Llandino NSW ceased to operate on 15MHz and was to reopen on 16MHz, 36 hours later. According to last month's *AR*, the 10 MHz signal was going to close down and also eventually be on a new standard frequency. The 5MHz signal was continuing unchanged.

Well, that is all for this month. If you have any news, just drop me a line, to the above address or via Packet, to VK7RH @VK7BE-1. Until next time, the very best of listening and 73 — VK7RH.

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EDUCATION NOTES

Brenda Edmonds VK3KT
Federal Education Co-ordinator
PO Box 445 Blackburn 3130

At the recent WIA Federal Convention the topic of examinations was raised by a number of delegates. Some Divisions expressed their dissatisfaction with the current arrangements for various aspects of the devolved system, and several proposals were advanced for improvements to either the question banks, the paper-generating program or the accreditation process. It was generally agreed that the system has become much more complex than was envisaged in the early stages of discussion with DoTC.

Some of the complaints have already been raised formally with DoTC by the Division or examiner concerned. Others are of the "they orta..." or "why don't they...?" type. In any new or revised system there will always be complainants who know how it should be done by others, and allowance must be made for these in any assessment of the success of the project. However, there is cause for concern when there is a general expression of dissatisfaction from those who are working hard to make the system viable.

In his talk to the convention on future aspects of DoTC/WIA liaison, David Hunt, Manager, Licensing, from DoTC accepted that there had been problems which were originally not apparent, and agreed that an evaluation of the devolvement processes might be appropriate at this stage. As a result, the WIA is now committed to evaluating the system from the position of the examiners.

So here is the "commercial". Input is urgently needed from any and all who have been involved in any way with production or administration of examinations of all types, and it is needed as soon as possible, as I need to have a draft report ready for the July Executive Meeting.

I already have comments from a small number of members who have made the effort to keep me informed. But this project will need as much as can be collected, and is seeking both positive and negative comments. Also, as well as comments on the present system, ideas or proposals for improving the system will be most welcome. It is taking the easy way out to simply criticise without offering constructive alternatives.

If you have modified the generating program, had extra questions approved, improved

the CW production program, found a simpler way of completing the paperwork or have any similar ideas which you are prepared to share, please send them to me at the above address (NOT the Callbook address) or at the Executive Office at Caulfield. What I am really asking for is a report on what the examiners are now doing, explanations of their complaints, and their suggestions for future improvements. Suggestions from members not involved in examinations will also be welcome, of course, but I expect that those who have had "hands-on" experience will have more to offer.

On a different tack, with WIA was recently approached by the Australian Science Teachers' Association about a publication being prepared for "Science in Schools Week" in August. A booklet on communications now being produced for distribution to schools has a small segment on amateur radio which is being sent to us for approval. So, please be prepared and co-operative if your local school approaches you for advice, ideas or assistance in the next few weeks.

I did not get much response from members last year to my suggestions for introducing amateur radio into schools. Perhaps later this year will be an appropriate time for follow-up contact with schools to maintain any interest that may be stimulated by the ASTA program above. Ideas, comments and feedback from any who have participated in such schemes would be most welcome. I look forward to hearing from you.

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REPEATER LINK

Will McGhie VK6UU @ VK6BBS
21 Waterloo Cr Lesmurdie 6076

In the last edition of Repeater Link I included a circuit of an audio automatic gain control amplifier. In this basic form it is a useful addition to your repeater's audio quality. Further additions to the circuit add frequency tailoring. The frequency compensation was designed to work in conjunction with direct frequency modulation of the transmitter's crystal oscillator, but may improve the audio response of a phase modulator.

VR1 sets the amount of high frequency cut
VR2 sets the amount of audio compression
VR3 sets the amount of low frequency cut
VR4 sets the amount of overall audio gain

When a positive voltage is applied to pin 4 (WIA NEWS), Tr1 is turned on, placing C6 in circuit. This increases the time constant in the audio AGC loop, so as to reduce the compression during WIA news broadcasts. A fast time constant is not advisable for broadcasts. If your repeater does not carry the WIA news, this function is not needed.

When a positive voltage is applied to pin 5 (mute), the audio is muted. Depending on your repeater setup, this is optional.

Adjustment of the overall frequency response can be done by ear. Comparing the input and output audio from your repeater, and making adjustments to the high frequency and low frequency, will produce good results. Another method is to compare the unmuted audio noise from a monitoring receiver to the unmuted audio noise from your repeater's receiver, as transmitted by the repeater. I hope you can understand the last sentence. To put it another way, open the mute on your repeater. Open the mute on a separate receiver; switch this separate receiver between the repeater's output and a vacant channel. If you have a good ear in interpreting "white noise", lows and highs, then adjust VR1 and 3 so that the repeater's audio sounds like the monitor receiver's audio, on the vacant channel.

The DC voltage on pins 2, 3 and 6 should all be half supply rail if the DC connections are correct to the IC. The connections to the 2N5484 FET seem to make no difference which way around the source and drain are. The drain to pin 3 of the IC is probably the correct way.

Trust you will find this circuit of some use in improving the audio quality of your repeater.

Do you have any simple circuits that are used in your repeater that you would like to share? If so, please send them to me. Simple hand drawings would be all right, as I can redraw them onto the computer.

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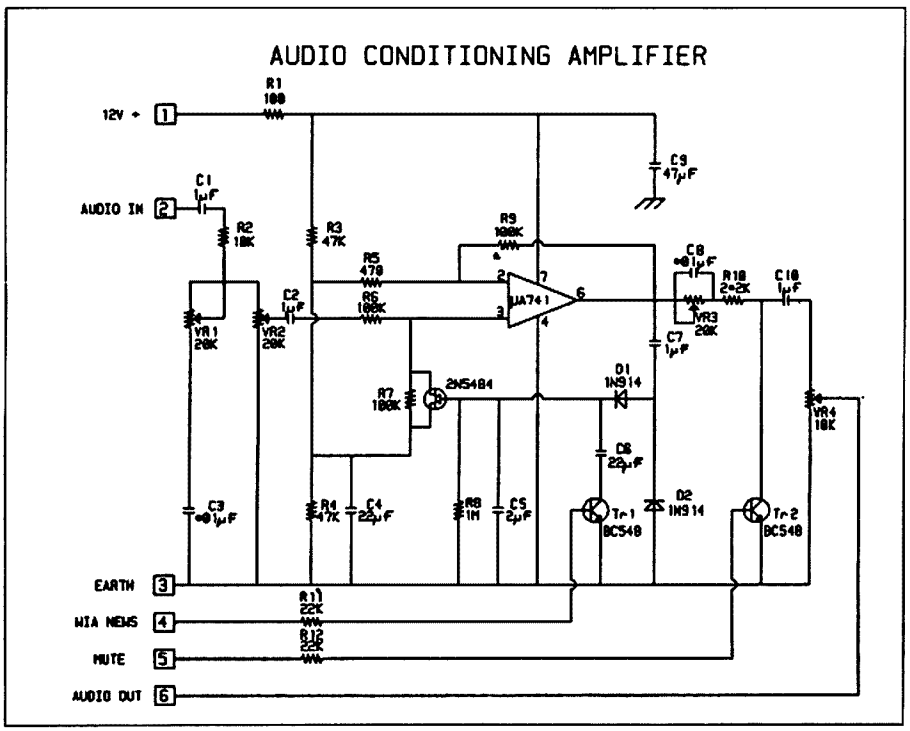

Book Bargains

When the Magpubs operation was transferred from the Executive Office to Divisional Bookshops, the following books were left over. Here is your chance to buy them at a bargain price.

- RSGB Amateur Radio Operating Manual, Third Edition
- Five left @ $16.25 each (normally $25.20) plus postage $2.80
- RSGB Radio Data Reference Book, Fifth Edition
- Nine left @ $19.00 each (normally $32.40) plus postage $2.80
- RSGB Radio Communication Handbook, Fifth Edition
- Eight left @ $44.75 each (normally $50.40) plus postage $5.00

Please send orders to:

Book Sales
WIA Executive Office
PO Box 300
Caulfield South
Victoria 3162

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. All of the items given below are available in the Executive Office Library. As a special service to Members Only, a photocopy of any complete article is available for $2.50 posted. To circumvent any copyright problems, please be sure to state - 'The information is required for the purpose of private study'. Address your request to 'The Librarian, Executive Office WIA, PO Box 300, Caulfield South Vic, 3162.'

Antennas

- Computer Software

The ELNEC Antenna Modeling Program. Bill Clarke WA4BLC, *73* issue #364 Jan 1991 pp 52 - 54. il graphs. A user friendly menu program based on MININEC, which calculates near and far fields for any antenna configuration, both for perfect and real ground. Antenna input impedance can also be calculated. It is designed for use with IBM PCs; with a graphics board, plots can be reproduced on a printer. Program is commercially available for US$50.

- Mechanical Details

Low-Cost Mag-Mount. Phil Salas AD5X, *73* issue #364 Jan 1991 pp 55 - 57. il diags. A design for a magnet mount with BNC connector. A suitable 2m/70cm dual band antenna is described for fitting to the mount. A cellular antenna, and a 10m converted CB antenna are also described.

- Microwave

An Inexpensive 10 GHz Dish System. Jerry Jensen WT0W, *73* issue #365 Feb 1991 p 57. A description of the plumbing necessary to couple a wave guide to a 10 GHz dish, using hardware store materials.

Pour an Antenna for X-Band. John M Franke WA4WDL, *73* issue #365 Feb 1991 pp 48, 50. il diags and photos. A description of the technique of producing lenses by casting paraffin wax. Although the material is opaque to light, it is transparent to microwaves; such a lens gives concentration of microwave energy.

- VHF/UHF

A Whip Antenna for 2 Metres and 70cm. Tom Moffat VK7TM, *EA* vol 52 No 4 April 1991 pp 82 - 87. il graphs and photos. A design for a dual-band whip antenna for use with a handheld via a BNC connector. It is constructed from the inner (solid) conductor of co-axial cable, and acts as a 5/8 wave on 70cm and a loaded quarter wave on 2m. Careful trimming of length gives an acceptable SWR on both bands. Performance superior to a 'rubber ducky' is claimed.

- Yagi

The Building Supply Yagi. Jack B Morgan W1FEA, *QST* vol LXXV No 3 March 1991 pp 22 - 24. il diags, graph and photo. Mechanical design details are described for a two element, low cost monoband Yagi, suitable for use on 10, 12 or 15m.

Computers

- Accessories

A Parallel Port I/O Board. Wally Gardiner VE6BGL, *73* issue #364 Jan 1991 pp 29 - 30,32. il cts, diag and photos. An interface which allows an IBM computer to control various electrical devices, either by a power transistor or a transistor-switched relay. Provision is made for feedback information, such as coffee pot temperature, to be fed back to the computer via the interface. Software is described for a testing program and a Morse code keyboard program.

- Software

Skymoon - Software for EME Communications. Dick Goodman WA3USG, *73* issue #366 March 1991 pp 40, 42. il photos. A product review for a commercial program, which provides on-screen information such as azimuth and elevation, to assist EME operators.

The WB2OPA LogMaster. Jeffrey A Meyer N8AHA and Bill Brown WB8ELK, *73* issue #364 Jan 1991 pp 34 - 35. il photos. A Product Review for a versatile HF logging program for an IBM PC supplied by 'Sensible Solutions'.

Electronic Devices

High Security IR Remote Control Switch.

Robert Priestley, *EA* vol 52 No 4 April 1991 pp 56 - 61. il ccts, cmps, pcbs and photos. An independent transmitter receiver combination which may be used to hold a relay closed when signal is present, or toggle apparatus on/off. Digitally pulsed 28 kHz signals are transmitted. Half a million different codes are possible, offering high security.

Filters

Transceiver Features That Help You Beat Interference. David Newkirk WJ1Z, *QST* vol LXXV No 3 March 1991 pp 16 - 21. il cct and graphs. A review of the various filter options available with modern transceivers and the techniques of using them to best advantage in interference reduction.

Packet

Packet with the Microsats. David Medley KI6QE, *73* issue #366 March 1991 pp 9 - 10. il cct. A general discussion of the software requirements to use packet with Microsats. A circuit modification is given to enable a PK-232 to receive UoSAT-OSCAR 11 telemetry data.

Power Supplies

The Three Terminal Regulator. E R Doublek N9RF, *73* issue #364 Jan 1991 pp 40, 58. An elementary application guide to the use of three terminal regulators as voltage and current regulators.

Receivers

- Accessories

Touch-Tone Activated Scanner. Don Moser AA7Y, *73* issue #366 March 1991 pp 30, 32, 34. il ccts, cmp and photo. A modified DTMF decoder and scanner provides a system that opens the receiver squelch only on receipt of a predetermined DTMF signal.

- Microwave

Radar Detector to Microwave Receiver Conversion. Steve J Noll WA6EJO, *73* issue #365 Feb 1991 pp 10 - 12. il ccts, cmp, graphs, pcb and photos. A technique is described to convert a Bell XKR radar detector to a 10GHz amateur receiver.

Satellites

- Microwave

Elementary Mode S. Ed Krome KA9LNV, 73 issue #366 March 1991 pp 21 - 22, 24, 26, 28. il cct, diags and photos. A general outline of transverter operation for 13m is given. A specific design is presented for a loop Yagi antenna for use on the same band.

- VHF/UHF

Tuning OSCAR with Separate Radios. Paul Summers KB3ML, *QST* vol LXXV No 3 March 1991 pp 25 - 27. il ccts and graphs. A system that enables the VHF uplink and UHF downlink frequencies to be controlled with one tuning knob. An optical rotary encoder determines setting of control knob. The up/down microphone connections are used to control each transceiver.

- Weather

Weather Satellite Reception. John E Hoot N6NHP, *73* issue #366 March 1991 pp 12, 14. il photos. Article describes modifications to commercial scanners necessary for reception of images from orbiting weather satellites on frequencies between 137 and 138 MHz. NBFM equipment is too narrow for the deviation used by these satellites.

Technology

- Earth - Moon - Earth

Two Meter EME Primer. Dave Blaschke W5UN, *73* issue #366 March 1991 pp 46, 48, 50, 52 - 53. il diags and photos. A general

discussion on how to get started in EME. A specific design is given for a stack of four 11 element quagi array, suitable for EME.

– Miscellaneous

Making Soldering Safer. Dr Bryan P Bergeron NU1N, *QST* vol LXXV No 3 March 1991 pp 28 - 30. il Photo. A cautionary article about the dangers associated with soldering. Asthmatics can become sensitised to resin flux fumes and decomposition products from plastic insulation. Lead poisoning is possible, not from vapour inhalation, but by transfer from hand to mouth.

– Transformers

Rewinding Output Transformers. Peter Lankshear, *EA* vol 52 No 3 March 1991 pp 118 - 120. il diags and photos. Detailed information is given for the rewinding of valve type output transformers, using simple home equipment.

The Basics of Transformers. David Botto, *EA* vol 52 No 4 April 1991 pp 90 - 94. il ccts, diags and graphs. An elementary review of the construction and operation of power, AF, IF and RF transformers.

Test Equipment

– Dippers

UHF Source Dipper. Martin Beck WB0ESV, *73* issue #365 Feb 1991 pp 20, 22. il cct, diags and photos. A design for a dipmeter which covers the frequency range 400 - 500 MHz. The active device used is a 2N4416.

– Field Strength Meters

UHF Field Strength Meter. Martin Beck WB0ESV, *73* issue #365 Feb 1991 p 24. il cct, diag and photos. A practical design for a FSM covering the range 400 - 500 MHz. A coaxially coupled wire loop is used as the pick-up coil.

– Frequency Meters

High Precision Frequency Standard. Gardner Johnson, *73* issue #364 Jan 1991 pp 9 - 10, 12, 14. il ccts, cmp, photos and pcb. A design for the generation of a high precision 1 MHz square wave, for calibration of frequency counters and digital frequency displays. The ultimate reference is a rubidium frequency standard used by each of the four major TV networks in the USA. The horizontal sweep oscillator of any colour TV set is synchronized to this reference, at a frequency of 17.7342657343 kHz. A simple ferrite loop is used to access this oscillation. The long term accuracy of the reference is claimed to vary less than one part in 10^{11} per month. (On a time equivalent basis, this represents a drift of one second in 31 centuries!)

The loop signal is compared in a PLL to provide a 1 MHz square wave output.

– Miscellaneous

An HF/VHF/UHF Marker Generator. J Frank Brumbaugh KB4ZGC, *73* issue #364 Jan 1991 pp 27 - 28. il cct, cmp and pcb. A circuit, based on Motorola K1160A crystal oscillator, provides harmonic rich rectangular wave outputs at 6MHz, 1MHz, 100kHz, 50kHz ,25kHz and 10kHz.

– Product Reviews

APPA 90 Series Series Handheld DMMs. *EA* vol 52 No 4 April 1991 pp 88 - 89. il photos. A comprehensive review of models 93 and 98.

MFJ SWR Analysers. Bill Clarke WA4BLC, *73* issue #364 Jan 1991. A review of MFJ-207 HF and MFJ-208 VHF portable SWR analysers. The units contain an in-built oscillator, and can be used to check SWR directly at the antenna, where adjustments can be made. It is claimed that the antenna system can be pre-tuned without signal radiation.

Transceivers

– Microwave

SHF Systems Linear Transverters for 1240 and 2304 MHz. (Product Review) Peter H Putman KT2B, *73* issue #365 Feb 1991 pp 40, 42. il photos. A review of a transverter kit suitable for conversion to and from 2m.

– Product Reviews

Kenwood's TM-941A Triband FM Transceiver. Ron Hranac N0IVN, 73 issue #364 Jan 1991 pp 36, 38 - 39. il photos. A report of the examination of this transceiver, which operates on 2m, 70 and 23 cm.

The ICOM IC-970H VHF/UHF Multiband All-Mode Transceiver. Joe Holman KA7LDN, 73 issue #366 March 1991 pp 36, 38 - 39. il photo. A review, without measurements, of 35/45W transceiver, which has 1.2 GHz band as an optional extra, together with an optional 50 - 900 MHz receive only function.

The Kenwood TH-27A. David Cassidy N1GPH, 73 issue #365 Feb 1991 pp 28, 30. il photo. A report, without test measurements, on the design and application of this miniature hand-held.

Yaesu FT-1000D MF/HF Transceiver. James W (Russ) Healy NJ2L, QST vol LXXV No 3 March 1991 pp 31 - 36. il graphs and photo. A comprehensive review of this equipment. Measured results are compared to specifications.

– QRP

A Station T/R Controller. Michael Bryce WB8VGE, 73 issue #365 Feb 1991 pp 63 - 64. il cct, cmp, pcb and photos. A QRP station controller which provides power conditioning, sidetone generation, loudspeaker output and transmit/receive keying with appropriate delays.

Thanks to those who have expressed appreciation of this column. We'll try to keep it going.

Glossary of abbreviations

il	The article contains illustrations, a list of which follows.
cct	A circuit diagram
cmp	A component layout drawing
EA	*Electronics Australia*
diag	A mechanical drawing
pcb	A master drawing from which printed circuits may be produced
QSTVE	*QST Canada*
73	*73 Amateur Radio Today*

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DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

New Council

The deferred closing date for council nominations and AGM resulted in sufficient personnel to fill the nine positions for the incoming council. The AGM is now to be held 1 June at 2pm at Parramatta as advised in the insert to May *Amateur Radio* which also contained the meeting notice and agenda, annual reports and balance sheets. The back page contains the QSL Bureau notification — please complete and return. On the same page is your membership card. This you RETAIN. Several were returned with the QSL notification. If you were one who did, you can collect it from the office or send in a stamped self-addressed envelope.

Broadcast Relays

We are looking for more clubs to provide relays to their local repeaters in country regions. If you can assist, please contact the Divisional Office. We are thinking about conducting some tests to the HF bands of 20, 17, 15 and 12 metres of the VK2WI broadcasts. These will expand our Australian and Pacific region coverage. Currently the facilities do not exist at VK2WI for the extra bands, so we are looking for groups of amateurs to provide suitable relays on our behalf. If you are able to receive one of the VHF/UHF signals from Dural and have an audio patch system, then get in touch with the office if you can assist.

Happenings

The Oxley Region field day at Port Macquarie over the June holiday weekend 9-10 June ... Sydney regional club meeting at Parramatta Saturday 15 June ... 80th dinner 28 June ... Planning still under way for next AUSSAT/Gladesville ATV test; the next may have a NASA theme. Listen to your local divisional broadcast for the date ... UHF repeater VK2RPM has been commissioned on Ch 8525 to serve the lower north coast. VK2RSD is operational from Nowra on UHF

Ch 9275, beaming south. VK2RUW on Ch 8225 has moved to higher ground in the Wollongong region.

New Members

A warm welcome is extended to the following who joined the NSW Division during April.

G K A'Bell	Assoc	Peats Ridge
B P Anthoness	Assoc	West Wyalong
G Baurhenn	VK2JAP	Blacktown
N T Cheers	VK2MKA	Kempsey
M K W Cheung	Assoc	Beverly Hills
R Collins	Assoc	Manly Vale
R Cowdery	Assoc	North Sydney
J Glenn	VK2AIO	Tweed Heads Sth
M Griffith	Assoc	North Epping
I C Griggs	VK2JCW	Castle Hill
I B Hands	VK2GKZ	Dee Why
D A Holyoake	Assoc	Tuross Head
B L Manton	Assoc	Mt Pritchard
N W Marr	Assoc	McMahons Point
R J Mills	VK2KRJ	Tamworth
R W Parry	VK2XVB	Rainbow Flat
W C Rosser	VK2ZWR	Northmead
P A Seifert	VK2MKG	Bateau Bay
R J Snare	Assoc	Blacktown
S G Straughan	Assoc	Holsworthy
G L Towell	Assoc	Nambucca Heads
M H Turner	VK2KTH	Ingleburn

80th Anniversary of the WIA NSW Division

As foreshadowed in previous broadcasts, and these notes, the NSW Division will host a special anniversary dinner to celebrate the Institute's 80th anniversary.

It will be held on Friday, 28 June at the fabulous Darling Harbour Convention Centre. It promises to be a memorable occasion; the venue overlooks Darling Harbour, with city lights in the distance. Enjoy a top-quality three-course meal, a few convivial drinks, a little light dinner music and perhaps a spot of after-dinner dancing! This will be a social occasion not to be missed.

Darling Harbour is well-served by public transport, and for those driving, plenty of parking is available at parking stations close by.

Tickets cost $49.50 a head and you can book through the Divisional Office at Parramatta. Phone up and "pledge your plastic", that is — use your credit card — on (02) 689 2417, or send a cheque to PO Box 1066, Parramatta 2124, by 14 June.

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5/8 WAVE

JENNIFER WARRINGTON VK5ANW

TTP Club Update

The TTP Club, as mentioned last month, now has an official title. It is the *North Eastern Radio Club or NERC* (not to be confused with the VK3 NERGs, with which we compete at SERG!). If you would like to be a NERC, ring Frank VK5NFA on 251 4776, or Peter VK5PBD on 264 1070.

Did You Know ... that at the Royal Adelaide Exhibition 1952 the SA Chamber of Manufactures awarded a certificate and medallion to the WIA SA Division "For an exhibit of very high order of merit". It would be nice to think that we could have had a similar display at the Hobby Fair on 22-23 June 1991, but at the time of going to press we had only one volunteer, so ... please contact a member of council urgently and see if there is still time.

1991 Council

Council members for the coming year are: Rowland Bruce VK5OU (President), John McKellar VK5BJM (Secretary), Bill Wardrop VK5AWM (Treasurer). (Other positions to be advised). Don McDonald VK5ADD, Bob Allan VK5BJA, Peter Maddern VK5PRM and Ian Watson VK5KIA are all continuing members, and we are pleased to welcome two new members, Mark Spooner VK5AVQ (currently also one half of the ESC team) and Rob Gunnourie VK5FI.

Reps for clubs include Bill "Spud" VK8ZWM for the Darwin Club when he's in town, and Harry VK5AHH (when Spud's not), and Bill VK5AWM is the rep for LEPARC.

Ashford Hospital seems to have had more than its share of amateurs as patients lately, including Spud VK8ZWM, Alan VK5NNM and Michele VK5ZYL (my daughter-in-law). I am pleased to say that all are now out and on the road to recovery.

Phone BBS

In case you would like to log on to the phone BBS the number is (08) 259 1359. You may not be able to access it first time up until your WIA membership has been accredited and entered.

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VK7 NOTES

FRANK MOORE VK7ZMF

VK7 Snippets

The VK7 Divisional AGM was held on 23 March 91 with a rather large attendance.

An election was held, with the following being elected to council.

President	VK7AL	Tom Allen
Secretary	VK7EB	Ted Beard
Treasurer	VK7ZPK	Peter King
Federal Rep	VK7JG	Joe Gelston
Broadcast Officer	VK7JK	John Rogers
Council	VK7JH	Jim Hiley
	VK7NBU	Bob Harding
	VK7ZMF	Frank Moore
Ex-Officio Council Members:		
	VK7BE	Barry Hill
	VK7PU	Phil Harbeck

This represents a fairly diversified section of amateurs spread throughout the state, including the north, north-west, west coast and south. Wishing all council members a productive year.

Also, a warm welcome to new members H M Rogers VK7DU and T E Spargo.

Packet Radio BBSs and Digipeaters VK7

VK7BBS	Launceston, North Tasmania Sysop VK7AE Andre
VK7EKA	George Town, North Tasmania Sysop Mervyn
VK7ZBA	Cranbrook, East Coast Sysop Bruce
VK7ZTA-I	Hobart, Southern Tasmania Sysop Anthony
VK7GL-I	Hobart, Southern Tasmania Sysop Andrew
VK7BE-I	Launceston, Northern Tasmania Sysop Barry
VK7RTY	Digi-Peater, Northern Tasmania Mt Barrow
VK7RIT	Digi-Peater, Southern Tasmania Mt Wellington

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QSLs FROM THE WIA COLLECTION

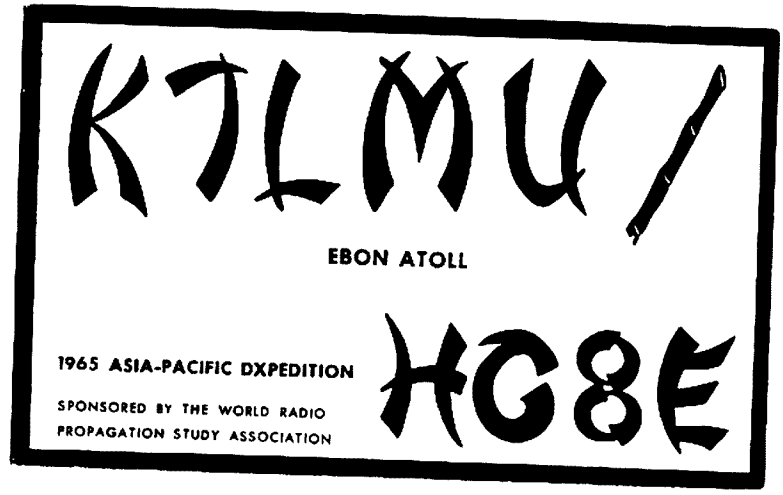
KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE 3139

The Marshall Islands — A Spoiled Paradise? (Part 2) K7LMU/HC8E

One cannot give an account of the story of amateur radio in the Marshalls without reference to the unfortunate episode relating to Ebon Atoll in the Marshalls. This "country" was added to the DXCC list in January 1966, the QST of that month pointing out that confirmations would be accepted provided permission for the operation was given either by Ecuador or by the UN Trust Territory authorities. Ebon Atoll was never at any time part of Ecuador despite the fact that "permission" was given for amateur radio activity to Don Miller W9WNV and Charles ("Chuck") Swain K7KMU by the Consul of Ecuador in Los Angeles. The explains the use of their K7LMU/HC8E callsign. At the time, there was great debate on the matter, the explanation being given that certain maps of the Pacific area incorrectly showed the atoll as being in Ecuadorian territory. After the mistake was realised, Ebon Atoll was deleted from the ARRL DXCC listing (as notified in the December 1966 issue of *QST*). Iris and Lloyd Colvin, under the Yasme Foundation, operated from Ebon in 1965 with the call KX6SZ/EBON, and from Majuro in the Marshalls as KX6SZ in 1965/66.

There has been some activity from the islands by other foreign DX-peditioners. It would

seem that their stations in the early 1980s were issued with the American prefix KX6, but with the suffix Z eg KZ6ZX (on Majuro by PA0GMM) and KX6ZZ by DF7NM.



V73AZ

In late 1989 the prefix change of the Marshalls from KX6 to V73 took place. The suffixes of the callsigns issued to former KX6 licensees bore no relation to their former calls, early operators having been issued with V73A calls. The local club on Kwajalein (formerly KX6BU) was issued with the call V73AX. The old prefix KX6 is currently being assigned to licensees in California. The V73AZ QSL shown here is the last of the V73A calls before the current issue of V73B calls. It was sent to top DXer, Mike VK6HD from members of the Roi-namur Radio Club on Kwajalein during last year's CQ SSB contest.

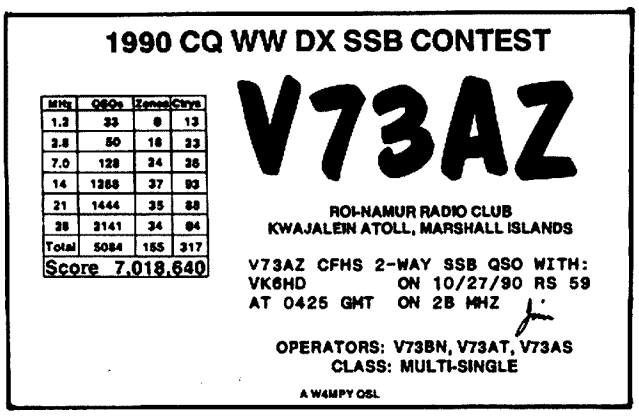
KX6BQ

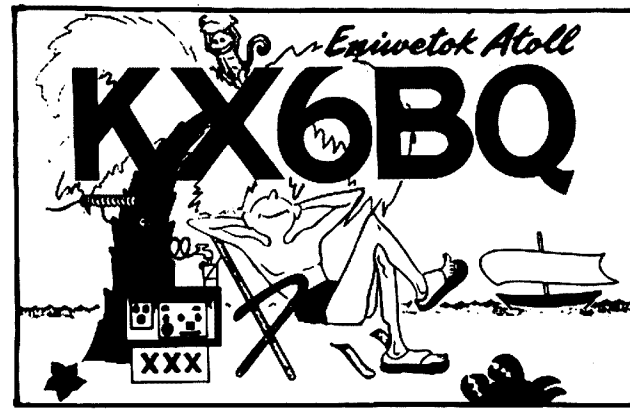
This attractive multicoloured QSL emanates from the Amateur Radio Club station on Eniwetok, which has operated over a considerably long period. The picture shows an idyllic situation. Once described as the "Pearl of the Pacific" by Robert Louis Stevenson, the Marshalls today do not paint such a rosy picture. In 1980, agreement was reached between the Marshallese and US Governments whereby the islands would be self-governing in domestic and foreign affairs, the US retaining military rights. In 1983, a UN Special Commission reaffirmed that military bases should not prejudice self-determination and independence. Although most texts indicate self-government being attained in 1986, in fact it was not until December last year that the UN Security Council voted to terminate the US administered trusteeship. (The Commonwealth of the Northern Mariannas and the Federated States of Micronesia were two other Trust Territories similarly affected). Previously only the decision to grant self-government had been made. Despite its name of "Republic of the Marshall islands", this young nation is frequently described as an "Associated State (with the United States)", since so-called "Compacts of Association" have been made between the two governments, giving the US effective control of defence and the maintenance of the missile facility on Kwajalein.

There is little doubt that abnormalities amongst the native population have been caused by radioactive fallout and by contaminated coral dust. There is a real problem with plutonium-contaminated topsoil, much of which has been buried under tons of concrete slabs. The Nuclear Claims Tribunal has conducted several hearings and, in 1988, the US Congress agreed to settle all claims by paying $US100 million into a trust fund for those affected,but court cases are still pending.

Having obtained self-government, the Marshallese find themselves in considerable financial difficulties. Copra, fish and handicrafts are exported, but hardly pay for the importation of Japanese cars and other luxuries. Tourism is just in its infancy and, despite having picturesque seascapes, beautiful lagoons and beaches, tourism cannot be compared with that of Guam and the Mariannas to which organised tours are arranged. (See "QSLs of the WIA Collection" *AR* April 1991). Air services operate to the Marshalls from Fiji, Guam and Honolulu, but have not been developed on a tourist basis, and hotel accommodation offered is also very restricted. Rental paid by the US for the missile base brings in much needed funds. In fact, the country is virtually dependent upon the US for its financial survival. President Amata Kabua has recently advocated the use of an atoll or two as a rubbish disposal facility for the US mainland, his argument being that such a move would make the US partly dependent upon the new republic as well as bringing in much-needed US dollars.

There was talk at one stage last year of the possibility of allowing the US to use the Marshalls as an atomic waste disposal area but the proposal was bitterly opposed. Another problem is the increasing birth rate of the Marshallese. In 1988 the population stood at just over 43,000, and these were living (some in appalling conditions) on 181 sq km of land just above the high tide level of the Pacific Ocean. Any rise in temperature of the ocean due to the Greenhouse Effect would have catastrophic consequences. Adding to the problem in the Marshalls is the malnutrition





of many of its inhabitants, diabetes being of great concern. As is the case of many a Pacific island, much of the problem lies with the importation of tinned food which has tended to replace the natural diet of fish and fresh fruit and vegetables. Is it yet another case of "Paradise Lost"?

Can YOU Help?

If you would like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated, but we especially need commemorative QSLs, special event station QSLs, especially assigned call QSLs, pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139, or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards. (Freight refunded).

Thanks

The WIA would like to thank the following for their kind contribution of QSL cards towards the collection (supplementary list):

Mike	VK6HD (ex G3HDA)
Austin	VK5WO
John	VK3HW
Frank	VK2QL
George	VK3GI
Brian	VK2MQ
Ron	VK3QP
Terry	VK2ALG
Herb	VK3JO

Also, the family and friends of the following "Silent Keys" (supplementary list):

Max Muller VK3LU courtesy of Jeff VK3LU

Peter Fawcett VK3APF courtesy of Stan VK3BSR

Ron Higginbotham VK3RN

Ron Schmidt VK3LY courtesy of Milton VK3MN

Reg Sankey VK3XP

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CLUB CORNER

Moorabbin and District Radio Club

A Hamfest (lectures, sales, demonstrations, door prizes) will be held between 10am and 4.30pm Saturday 15 June at Cheltenham North Primary School, corner Bernard and Chester Roads, Cheltenham North. Refer Melways 77 J10. Admission charge $2. VK3 members will find more details in an insert in this issue.

Darling Downs Radio Club

In October of this year, the Darling Downs Radio Club intends to have a practical day of experimenting.

Our intention is to send up a weather balloon with an antenna attached suitable for 160m experimental contact. We hope to make various contacts, changing the antenna from one-quarter wavelength through to at least one wavelength.

When these "field day" experiments are completed, it is our desire to launch the balloon with a beacon as a payload. At present we are collating all data and information (eg prevailing winds, height estimation of the balloon etc, etc) so that when the times comes we will be ready.

We will have to gain both CAA and RAAF permission, with possible approval from the meteorological people.

We will, of course, be in touch with our local airport authorities, since a relatively large number of light 'plane flights occur from the Toowoomba airport. We will be conducting these tests from a property at Hampton, some 32km road distance from Toowoomba.

Theo Möller VK4ESK (Hon Pres)

Brisbane North Radio Club

Following the AGM of this club earlier this month there were a few changes in office bearers.

Below, for your information, are the current club details.

Club Information

The club office bearers are as follows:

President, Paul Keating VK4BGT. Ph: 266 7936

Vice-Pres, Graham Clayton VK4BGC. Ph: 359 0109

Secretary, Bill Rahmann VK4BIL. Ph: 263 2630

Treasurer, Beverley Clayton. Ph: VK4NBC. Ph: 359 0109

Stn Manager, VK4WIN Ed Fisher VK4ABX. Ph: 357 6696

Asst Stn Managers VK4APZ

Library & Prop Officer, Col Hinxman VK4ACH. Ph: 356 9816

QSL Officer, Seb Calabro VK4FAX. Ph: 359 3529

Intruder Watch (IARUMS) David Brownsey. VK4AFA. Ph: (work) 835 8322

WICEN Rep, Geoff Adcock VK4AG. Ph: 359 7332

Education Officer, vacant

Awards Manager. Secretary carries out this task

Examinations Officer, Laurie Pritchard VK4BLE. Ph: 266 1454.

Bill Rahman VK4BIL
PO Box 78 Chermside 4032

Salvation Army Radio Operators' Fellowship

VK/ZL Chapter

Efforts are being made to re-establish SAROF in this region. With this in mind, the following steps have been/are being taken:

The callsign VK1SA has been taken out on behalf of SAROF, weekly nets are being established, from 1 May 1991, as below:

Tuesday 1000 hours UTC on 3.615MHz

Saturday 0600 hrs UTC on 14.300MHz +/- QRM

Future projects include:

A regular newsletter

A "special activity station" at the Salvation Army Training College, Sydney on Gala Day, 23 November 1991 using the SAROF callsign VK1SA/2.

Membership is open to all Salvation Army soldiers who are licensed amateur radio operators.

K E Threlfall VK1KT, 13 Bundeela St, Narrabundah 2604.

Hervey Bay Amateur Radio Club

We wish to advise that the Hervey Bay Amateur Radio Club will be activating a special event station. The callsign VI4HBW will be activated from 1 August 1991 to 31 August 1991. This will coincide with the Festival of Whales.

A guide to the frequencies is as follows: 3.790, 7.085, 14.226.5, 21.205, 28.495MHz, or as near as possible.

This annual festival celebrates the arrival of the humpback whales into the sheltered waters of Hervey Bay. During the next three months, these gentle giants of nature rest and rear their young, using the bay's warm waters as their personal playground, before continuing their migration south to the Antarctic region.

Visitors from many countries and all states of Australia travel here for this spectacular event.

An award and QSL will be available for working this special event station. Applications for the award may be directed to Box 829, Hervey Bay, Qld 4655.

73

Jim White VK4JWW
PO Box 829 Hervey Bay, 4655
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Have you advised the WIA Executive Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr R A Plater	L20717
Mr J B Kozka	L30539
Mr Harry Caldecott	VK2DA
Mr Bill Kirk	VK4BWK
Mr M G Farmer	VK5GF
Mr R J Amos	VK5KRA
Mr Cyril Rutledge	VK6CR
Mr Clem Burtt	VK7NBC

Bill Kirk VK4BWK

Bill Kirk passed away at the Homefield Aged Persons Homes, Mackay on Tuesday 16 April after an illness.

Born in New Zealand, he came to Australia in 1926 and, after working around the country, finally resided in Mackay in the early '40s. He gained his Radio Service Engineering Certificate from the Australian Radio College in November 1944. He was active mainly on 40 metres, with the callsign VK4AM. Just after the war, he ran a wireless service shop, until a fire and a flood forced him to change business.

His use of the hobby lapsed for a time, because of his heavy involvement as a gardener and in supporting the Uniting Church, especially at Homefield. Over the last eight years, he took up amateur radio again, and was able to operate from his unit at the homes under the callsign VK4BWK.

An ardent supporter of the Mackay Amateur Radio Club, Bill operated mainly on 2m FM, but loved CW sessions and SSB ragchews on 80 and 40 metres. An extremely conscientious and generous man, Bill will be missed by his friends.

CHARLES IVIN VK4DK
WIRELESS INSTITUTE
LIAISON OFFICER
MACKAY AMATEUR RADIO CLUB

Phyllis Mabel LeGrand VK4CPL

Phyllis (Phyl) passed away suddenly in Cairns on 14 February last. Members of the Cairns Amateur Radio & Electronics Club, their families and, indeed, the many radio amateurs who knew her, were shocked and profoundly saddened at the news of her passing.

Although born in England, Phyl spent her childhood and school years in Sydney. In October 1943 she and George LeGrand were married and, in the early 1950s, they came to Cairns to set up their home in the suburb of Earlville. Over the years, Phyl selflessly gave her support to various community and charitable bodies — she was a founder-member of the Earlville branch of the QCWA, and was also well-known for the music programs she presented on the local community FM station, 4CCR.

Phyl joined the amateur radio ranks about 10 years ago, when she obtained her novice licence VK4NDG; she gained her full-call licence just three years ago. She served on the committee of the Cairns Amateur Radio Club as honorary treasurer for eight years and everyone, myself included, who had the good fortune to serve on the committee with her, would attest to her dedication and loyalty to the club. Phyl endeared herself to all through her generosity and perpetual good humour, and we in the club greatly miss her.

To George, son Brian and family, the president and members of the Cairns Amateur Radio & Electronics Club extend deepest sympathy.

KEN PYETT VK4MKP
PUBLICITY OFFICER
CAIRNS AMATEUR RADIO
& ELECTRONICS CLUB INC

Maxwell George Farmer VK5GF

Max died at the Alice Springs Hospital on 26 March 1991.

He was aged 74 years and was cremated at the Centennial Park Cemetery on 4 April 1991.

Several years ago, Max conducted a radio manufacturing business at North Terrace, Adelaide and, later, at Angas St, Adelaide. This provided mobile vehicle radios for commercial purposes.

His organisation also provided service facilities for these units for private users and the country emergency fire services. Ill health later on restricted his activities, which were conducted from his home premises.

He assisted all comers with their electrical difficulties and needs.

Max was also actively connected with the amateur radio movement for over 50 years in addition to his professional radio undertakings, and was always willing to assist amateur radio operators — myself among them.

This was very much appreciated by those concerned, and we regret his passing. His wife pre-deceased him, but a son and daughter remain.

Jeff VK8GF was able to journey to Adelaide from Alice Springs to attend the funeral service, which was very well attended, indicating the respect with which Max was held by the community.

On behalf of all who were aided and assisted by Max, I extend our condolences to his family.

I acknowledge assistance in preparation of this by VK5FR Bill Franzi, who was associated with Max in some of his activities.

TOM LAIDLER VK5TL

Cyril Rutledge VK6CR

Cyril Rutledge was born on 10 January 1904 at Marmion St, East Fremantle, the son of John and Amy Rutledge (who was a great-granddaughter of Henry Trigg, who came to WA in 1829).

After serving his apprenticeship with Mr John Scurlock, he qualified in 1928, opening a pharmacy in Carnamah. In 1931 he moved to Dalwallinu, where he remained until 1944.

He had always been interested in radio since building his first crystal set. The were only two radio sets in Dalwallinu when he arrived there. During the Test series of the 1920s, he rigged up earphones so that the cricket enthusiasts could listen to the broadcasts. (He was given engraved cufflinks by the grateful listeners). During World War II he repaired radios for the district.

In 1944 he went to commercial radio 6IX as engineer, also doing relief work at Katanning and Merredin. However, he returned to pharmacy in 1945, retiring in 1972. It was in the late '70s that Cyril was encouraged to take up the position of Slow Morse Co-ordinator for the VK6 Division, a job he enjoyed and excelled at. This culminated in 1980 when he was voted "Amateur of the Year".

Cyril also displayed considerable talent in other areas, playing flute in the South Perth Philharmonic Orchestra. He also sang in the popular Commercial Travellers Choir.

Cyril was a true experimental amateur, showing great innovative talent when experimenting with various pieces of equipment.

After a period of hospitalisation, Cyril passed away on 11 March 1991. He is sadly missed by his family and friends.

Stanley Clement (Clem) Burtt VK7NBC

Born 22 October 1917 — Died 16 March 1991.

A life-long interest in radio was, towards the end of his working life, translated into a novice licence. This modest achievement provided Clem with considerable enjoyment in his retirement and enabled him to enjoy many satisfying friendships via the airwaves.

R F BURTT

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

CB or Amateur?

Usually, in a democratic society, voting is used to decide major issues of the day. But those of us who were around when 27MHz was allocated to the CBRS, remember that no vote was taken on that subject. The weight of illegal operators forced the DoTC to allocate the 27MHz band to the CBRS. This was the only course of action the authorities could take.

Please consider (where have I seen that before?) the following:

DoTC statistical summary for March 1991 of radiocommunication stations licensed for operation in Australia and External Territories gives that there were:

19,392 amateurs, 418,551 CBers,

289 amateur repeaters, 377 CB repeaters

1. And we are worried about 28MHz intruders from the north of Australia?
2. Should we not target the CBers as a potential source of amateurs?
3. DoTC cannot supply a list of names and addresses of the CBers due to the Privacy Act.
4. What shall we (all amateurs) do?
5. Nothing?

NEIL PENFOLD VK6NE
2 MOSS CRT
KINGSLEY 6026

(I wrote this month's editorial before reading your letter, Neil. We seem to agree rather well! Ed).

Thin End of the Wedge?

It has suddenly become not "Use it or lose it", but "populate or perish" on 10 metres. I had the misfortune to intercept blatant CB activity on 27/4/91 at 0706 on 28.500MHz. It was conspicuous because it was LSB with usual short bursts of speech and jargon between three stations.

This unfortunately coincides with the promotion of eg the HR2510. I understand DSE has sold the lot. My DSE agent nearby asked no questions about licence or end use at the time I purchased my HR2510. In fact, examination of the Bankcard slip back at QTH revealed that he had in fact booked it out as — you guessed it — CB radio!

Congratulations to Uniden for page 17 and 18 of the HR2510 handbook. The company is sure trying to prevent piracy by providing copious warnings and WIA information. When will our pollies and DoC make it mandatory to produce a licence before purchase of transmitting apparatus is allowed?

It's on fellers, Forget the Asian invasion. Remember the 27MHz saga? And its ultimate amateur bereavement?

As a footnote, 25W irrigation transmitting sensors are available through a firm in Geelong which claims DoC has allocated it 29.1MHz. I thought 28 to 30MHz was exclusive amateur service! Ah well!?

MAX STARK VK2CMS
Box 89
KORALEIGH 2735

(Actually 28 to 29.7MHz, Max, but makes no difference. Ed)

Pirate Problem?

Having been QRT for about 10 years has apparently allowed someone to misrepresent my callsign, as evidenced by a number of QSL cards received ex-Bureau this day. The cards report two-way SSB communications on 7, 14 and 21MHz from February 1988 through December 1989 between VK5HP (no operator name cited) and various European stations.

Licensed in 1975, I have NEVER made a voice transmission on any amateur band, as I work HF CW exclusively. *(And QRP at that!* Ed).

Perhaps this is the new game in town???

On a lighter note, I wish to publicly acknowledge the fraternal support extended me by the members of the Whyalla Amateur Radio Club, Peter Baker of Whycom, Andrew VK5AAQ and, more recently, Neville VK5XD and Bernie VK5ABS of the South Coast Amateur Radio Club, for assisting me in returning to the greatest hobby of them all. Thank you.

"DOC" WESCOMBE-DOWN VK5HP
C/- WHYALLA ARC
PO Box 444
WHYALLA 5600

Novice Anomaly

The Department of Transport and Communication brochure DOC71, revised in July 1990, on page 7, indicates that:

37. The licensee of an amateur station (novice) shall only use the following emission modes:

(a) when operating on bands below 30MHz: 200H1A1, 8KOOASE, 4KOOH3E, 4KOO43E, 8KOOB8E/B8W and 4KOOJ3E"

The above emissions are clarified in another DoTC brochure, DOC72, also revised in July 1990, and generally mean

200H1A1	— CW
8KOOA3E	— AM
4KOOH3E	— SSB full carrier
4KOOH3E	— SSB reduced carrier
8KOOB8E/B8W	— ISB, independent side band with two or more analogue channels, supporting any combination of telegraphy, telephony, fax, data and TV
4KOOJ3E	— AAB suppressed carrier

The mode 8KOOB8E/B8W is rather surprising. Has DoTC conferred on novices a full range of multiplexed packet, RTTY, voice and TV modes on bands below 30MHz?

Or are we asked to spot the deliberate mistake in the publication?

WILL SCOTT VK4XP
PO Box 826
GLADSTONE 4680

Standards

Before somebody takes me to task over my letter in May issue I assure them all that I do know the difference between a 'bit' and a 'byte'.

There are eight bits to a byte, and my letter set out to stir by suggesting that 20mb is "a very difficult concept to understand at two-and-a-half thousandths of a 'bit'", which lost something in editorial translation, the point being that a small case 'm' is a divisor. At eight bits to the byte, of course, there must be only 2M5 bits in 20mb, must there not? I apologise for being too subtle.

Thank you for the statement "small k for kilo is standard" and the inference that capital M for Mega is standard which, together with the 20mb problem, amply proves my original point that our standards need to be standard. Just because something is, does not make it right.

PETER HUGHES VK6HU
58 PRESTON ST
COMO 6152

Handbook Success

I noted that you mentioned the *Novice Operator's Theory Handbook* in your editorial in the April issue of *AR*.

I'd like you to know that we published it in about 1980-81 and have sold over 9000 copies so far. So we consider it highly successful, as the Australian market is not exactly a large one.

We had no joy with WIA-affiliated organisations overseas so far as interest in sales was concerned so we concentrated on the local market and it has been pretty good, with many testimonials from newly licensed amateurs calling or writing letters of thanks for the book having helped them "to get there".

The significant thing is that it is the first, and we think the best, theory book written for the local novice licence candidate in this country.

Our stocks are now running low, so we are planning a new and updated edition, so any reader's comments and suggestions would be welcome at this time.

I'd be grateful if you would print this letter and thus possibly inspire some reaction from the readers out there in WIA-Land!

By the way, I'm proud to be a member and supporter of the WIA as I have been a member for quite some years now and I strongly believe in being an active member.

I enjoyed my stint as Federal Education

Co-ordinator, and the links with the DoTC and with delegates at the annual conference were invaluable, I believe, in learning more about the issues and how the democratic process works in the WIA.

All the best, and good wishes; thanks for a great magazine. I always read it through once it arrives, and it certainly helps me to take up with what's going on in VK-Land.

Graeme Scott VK2KE (ex VK3ZR)
635 Edmondson Ave
Albury 2640

Value of IRCs

Regarding Phill Hardstaff's comments about IRCs I agree that there is a lack of knowledge concerning the latest instructions as to the amount to be given when they are redeemed. Following the first article, I took two IRCs to my local post office (an unofficial one) and the Postmistress stated she could give me only 85 cents, that is the surface rate for an overseas letter. I showed her the article and she then rang her controlling post office, Queen Victoria Terrace, which also advised 85 cents. She quoted the article to them and, following further investigations, they advised that the correct amount was $1, and that the $1.20 you received was wrong. However, they promised to look further into the matter.

Last week I was again in my suburban post office, and the Postmistress said that further investigations had proved that $1.20 was the correct amount. She showed me the relevant section in their instruction book and it was very clear that the redemption rate is the airmail postage rate for Zone 5.

Should anybody have any problems with their post office, they should quote Section 10.23 of the regulations.

Frank Macklin VK1ZL
1 Macartney Cres
Deakin ACT 2600

AR and *ARA*

Ray Jones has submitted a package of common sense (May '91) when he advocates the pooling of our resources with Syme Media Pty Ltd and becoming a vital part of that company's highly successful *Amateur Radio Action*.

I refer readers to Fact 3 in his three-point plan.

The WIA "establishment" will probably ignore, possibly hate, this amalgamation, which is full of merit.

But, instead of sweeping it under the carpet without any proper open and frank discussion, let us read it sensibly and objectively, unlike the *AR* editor's comments to Ray Jones ... "Shall we burn him at the stake?" in the May issue. Most improper, with little regard to Australia's free press.

It's obvious *Amateur Radio Action* is a goer, packed with advertisements, product reviews, DX from a world leader, Jim Smith VK9NS, and pages upon pages of tidbits that assure it of a bumper circulation month by month.

The spinoffs to the WIA through such a move would be tremendous.

Costs would be cut dramatically, and our message would go to a far greater number than today.

If we want to get the novices of today into our fold, then now is the time to open our doors through doing a deal with the Syme Organisation.

Let others comment on Ray Jones' suggestions before you, Mr Editor, "light the fire".

Roth Jones VK3BG
23 Cherry Tree Grove
Croydon 3136

(The comment was intended to be humorous, Roth, in view of Ray's use of the word "heresy". Ed)

Fortress CW

I feel compelled to reply to VK2PA's volley from the parapet of Fortress CW, in *AR*/OTY for May.

My letter in April OTY was not an attack on CW, so please stop defending CW — for those who enjoy CW, I wish them many happy hours "pounding brass".

The days when CW was essential to the enjoyment of amateur radio are gone — that is, essential not in terms of qualifications, but in terms of the alternatives available now to CW illiterates.

There are many topics vying for the attention of the radio amateur, however, people have only limited time (and money) to indulge their interest, and they choose carefully.

Many decide against CW, particularly those who do not take easily to the subject — they are not interested in slogging away at something they do not find enjoyable, when there are so many alternatives.

CW is under attack, not from an "Anti-CW Lobby", but a far more dangerous adversary — "disinterest", and, as a result, many amateurs turn their backs on a large part of the spectrum.

The "compulsory CW" routine is no longer going to bring in the numbers, and that's your problem.

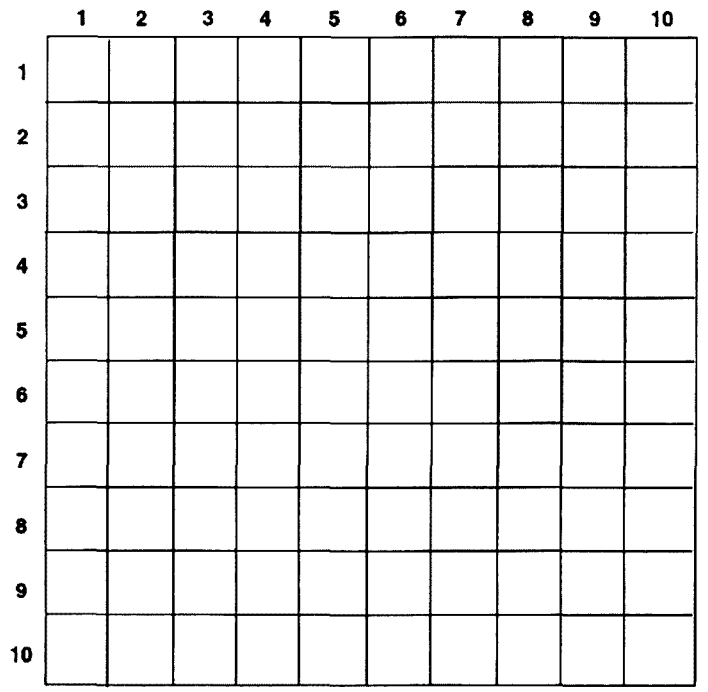
I am not sorry if my April letter made you sick, Peter; what upset me is that you will not even consider modification of the CW requirements for handicapped people "despite what our personal compassionate thoughts may be" (your words, OTY Feb).

I have a great admiration for the achievements of the physically handicapped, and believe strongly that they should be given special consideration, wherever appropriate.

I wonder what the Public Advocate, the many organisations devoted to the welfare of handicapped people, and other radio amateurs, would say about your advice to VK5KIR (Feb OTY), "Stick with it, Ian, you only have 5wpm to go."

Graham B Jackson VK3TFN
PO Box 39
Upper Beaconsfield 3808

Morseword No 51



Across
1 Sausage
2 Prison
3 Irritate
4 Strip
5 Small animal
6 Endure
7 Whole
8 Lid
9 Stated
10 Mature

Down
1 Parched
2 Communication
3 Fibbed
4 Baby's protector
5 Successor
6 Move swiftly
7 Beginning
8 Filth
9 Not here
10 Urn

Solution Page 56

Inadvertent Error

In my letter "Code Not Only Problem" in April, I felt that the word "not" was missing in one spot. Tracking back, it turns out that it WAS missing in my original; that not editor, nor keyboard operator, nor proofreader had a role in the word being missing.

The sixth par should have read:

"Ten words per minute Morse is NOT very likely, even after a year or two practice — say 20 minutes a session — at taking down 10wpm, to trim this K call back to a full call, even with frequent examination during that time."

Yes, there was another oversight, too.

My apologies to all involved in publication, and to any who wondered what was being got at when reading it.

IAN CROMPTON VK5KIC
9 CRAIG ST
RICHMOND 5033

Need for Code?

Letters are frequently published either supporting or opposing the retention of the requirement for an ability to send and receive Morse at certain speeds in order to qualify for certain amateur licences. Usually opposition is construed as being to the mode itself, which is often not the case. There are many advantages in being able to use Morse, and many reasons why amateurs should learn it, but no reason why it should be a licence condition, any more than skill in typing, although highly desirable when using keyboard modes, is a licence condition.

In the early days of radio, a knowledge of Morse was essential, as it was the only mode by which communication was possible, but now it is but one of many, and yet it is still singled out as the one in which licensees must qualify. There appears to be no point to this if the candidates have no intention of using it after qualification. Equally, operators who have otherwise qualified should not be denied access to certain frequency bands simply because they lack that knowledge. Competence in Morse is no measure of an amateur's overall ability.

At the present state of the art, continued insistence on this licence condition can only be regarded as both repressive and retrogressive, and therefore a deterrent to the populating and preservation of our bands.

As a former commercial operator, I have no personal problem with Morse, but I have always opposed the existence of unjustified restrictive practices. This licence requirement appears to be such a practice.

S V ELLIS VK2DDL
82 TAREE ST
TUNCURRY 2428

AR

ALARA

JENNY ADAMS VK3MDR
70 KANGAROO GROUND RD WATTLE GLEN 3096

Greetings to all,

It is amazing what information people keep for any one of a hundred reasons. Within a week of the arrival of the April *AR*, Marilyn VK3DMS received a letter from Rod Torrington VK3TJ. Rod still had his 1938 callbook, and looked up the listing, which in those gracious days listed everyone as Mr, Miss or Mrs. (Oh, for some of that today). So, thanks to Rod, we have the following list:

* 1. VK2GA McKenzie, Mrs F V, 26 George St, Greenwich Point
2. VK2YG Litchfield, Miss L N, 4 Yeo St, Ashfield
* 3. VK3HM Hutchings, Mrs E L, "Bryn Avon", Callawadda
* 4. VK3HQ Hutchings, Miss M L, "Bryn Avon", Callawadda
* 5. VK3YL Marshall, Miss M A, 650 Dandenong Rd Murrumbeena
6. VK4JH Humphry, Mrs I J L, Poopoonbah via Giru
7. VK4LO Nolan, Mrs V E, 110 Wharf St, Brisbane
8. VK4YL MacKenzie, Miss F M, Fire Station, Wynnum
9. VK5YL Geisel, Miss B A, Charles St, Murray Bridge
10. VK6JC Chinery, Miss J C, John St, Welshpool
11. VK6MH Hill, Mrs M L, 33 Trenton St, Wiluna
12. VK6YL Longley, Miss R V, 7 Cathbert St, Shenton Park
13. VK7YL Crowder, Miss J I, 88 Main Rd, Lower Sandy Bay

The names marked with an * we DO have information on already. So, to all hoarders of objects that may be useful one day (people after my own father's heart, and much to my mother's horror) we will continue to appreciate your efforts in our history hunt of women amateur radio operators of the past. It is interesting to note that VK5YL is recognised in the Adelaide Telecom Museum.

At the Easter WICEN exercise (the Mildura Caltex Ski 100) there were three ALARA members involved — Marilyn VK3DMS who is Region N Co-ordinator, VK3BJB and Marlene VK3JAW! Since these are the only three ALARA members in Mildura, this is quite a good effort.

Remember our Monday night nets. It is really nice to hear new voices on the air.

73/33

ar

Preparation for Warc-92 *(Continued From Page 24)*

Membership of Delegation

As a member of the Australian delegation, David Wardlaw was able to participate in discussions between the Australian, US, Japanese and UK delegations. There was close co-operation and a free exchange of ideas and information between Australia and New Zealand.

Participation in the JIWP was a very important factor in the lead-up to participation in WARC-92.

Role of the IARU

The work of the IARU in making submissions to and being represented at the meetings of IWP 8/14, IWP 8/15 and JIWP 10, 6, 3, 8/1 paid off in that the references to the amateur services from these meetings which made up part of the draft report of JIWP WARC-92 were able to be maintained in the final report.

It is to the benefit of the amateur service that there is a dedicated group of amateurs within the IARU and various administrations who are able to contribute in this area.

Why Did the WIA Participate in the JIWP WARC-92 Meeting?

The answer to this is contained in the substance of the JIWP WARC-92 report which answered a number of questions put about the amateur service, its operational and technical characteristics, and frequency requirements. It was essential that the final text in the JIWP report covering these questions which were put about the amateur service truly mirrored the functions and requirements of the service.

The importance of CCIR preparation for ITU conferences was highlighted in WARC-79, where the report of the CCIR Special Preparatory Meeting (SPM) held in 1978 contained a suggestion of the need for an increase in the amateur family of frequency ands on HF, and also for the amateur satellite service.

These suggestions were taken up at the WARC, resulting in the allocation of the new HF and satellite bands.

If the SPM report had not contained favourable comment on these issues then the amateur service would have had a much more difficult task to get them through the main conference.

WIA participation in the SPM in 1978 helped to have the essentials of an Australian inpput document (produced by DOC and the WIA) included in the report of the SPM to WARC-79.

Thus, to get a reasonable hearing, the amateur service needs actual representation at a national delegation level as well as a presence by the IARU itself.

As the WARC in 1992 is only a limited allocation WARC and has no scope for the expansion of amateur bands, the WIA has had to take a defensive position on behalf of the amateur service, making sure that the output of the JIWP did not make things hard for the amateur service at next year's WARC.

Australia was one of only three countries with a member of their delegation to JIWP WARC-92 primarily representing the amateur service.

ar

HF PREDICITONS

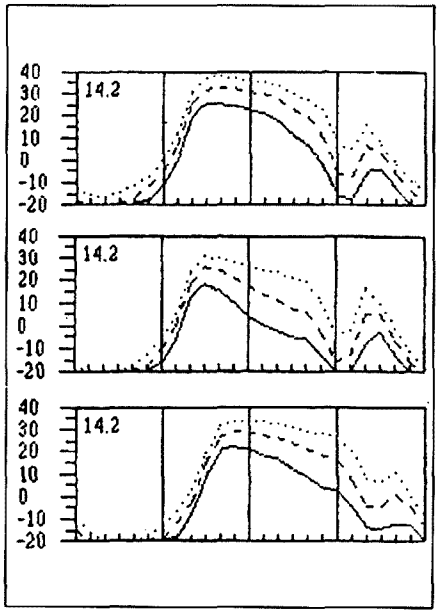
ROGER HARRISON VK2ZTB
THE APOGEE GROUP

Listings now directly in signal strength

The charts now provide predictions **directly in signal strength** (which you can relate to S-points), a much more usable and understandable form. The charts are otherwise exactly the same format, and based on the same parameters as I have used previously.

The base reference signal strength is 1 µV in **50 Ohms**, which is between S3 and S4, if your S-meter is calibrated to this standard, where S9 is 50 µV, and the lowest detectable signal 0.1 uV (see Ref.1). The table below relates µV, S-points and dB(uV) based on this standard.

µV in 50 Ohms	S-points(6 dB)	dB(µV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	-2
0.39	S2	-8



0.2 S1 -14.

An entirely new prediction program has been developed in conjunction with colleague Jack Middlehurst, based on the methods developed by T Damboldt and P Suessman and used in their program MINIFTZ4, which I was using to generate the previous charts. This new program has been written in the C language and is called **Graph-DX.** It features a friendly, easy-to-operate 'user interface', based on a series of menu screens, and a variety of output graphs and tables which can all be displayed on-screen (EGA, Hercules or VGA) as well as output to a variety of printer types. What you see on the screen is what you get on the printer (WYSIWYG propagation predictions!) Output graphs can be presented directly in terms of **signal strength at the receiver** - either dB relative to 1 mW (dBm), or dB relative to 1 µV, in 50 Ohms. Output in dB re 1 µV/metre field strength, is retained, too. Sales and technical enquiries on Graph-DX may be addressed to: FT Promotions, PO Box 285, Balmain NSW 2041. There being a special DXpedition to Baring Is in July, the accompanying graphs, from Graph-DX, for 14 MHz provide a good idea of times you might try to get through. Ref 1. *Signal Strength, "S" Meters and Preamps,* Gordon McDonald VK2ZAB, AR, July 1990, p14.

ar

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.6	8	15.6	-5	6	8	6	1
2	20.5	2	15.4	-18	-2	2	2	0
3	22.7	1	16.9	-31	-8	-1	2	1
4	25.6	2	19.3	...	-13	-3	2	2
5	27.4	3	21.0	...	-16	-5	1	3
6	28.0	3	21.9	...	-16	-5	1	3
7	28.4	3	22.6	...	-14	-4	2	3
8	27.8	2	21.1	-33	-9	-1	2	2
9	24.3	2	18.4	-23	-4	1	2	0
10	21.1	2	16.0	-13	0	2	1	-4
11	18.0	3	13.6	-4	3	2	-3	-11
12	15.6	4	11.8	2	4	0	-9	-21
13	13.8	7	10.4	8	4	-4	-17	-33
14	12.9	13	9.7	12	3	-7	-24	...
15	12.6	20	9.6	17	4	-9	-29	...
16	12.4	25	9.4	20	4	-11	-33	...
17	12.4	27	9.4	21	4	-12	-34	...
18	11.1	30	8.5	17	-3	-22	...	...
19	9.6	32	7.3	9	-16	...	...	...
20	9.3	32	7.2	7	-19	...	...	...
21	13.2	29	9.9	25	9	-7	-28	...
22	20.6	21	15.9	34	27	19	9	-2
23	19.2	20	14.7	23	21	16	9	-1
24	21.8	15	16.7	9	15	15	12	6

VK EAST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.8	14	15.8	10	15	14	9	3
2	20.5	7	15.4	-6	5	7	5	0
3	22.8	4	17.9	-22	-3	2	4	2
4	25.9	4	19.7	-33	-9	0	3	4
5	27.7	4	21.4	...	-13	-2	3	4
6	28.3	4	22.2	...	-14	-3	2	4
7	28.7	4	22.9	...	-13	-3	3	4
8	29.8	3	22.4	34	-9	0	3	4
9	26.4	3	19.8	-25	-5	1	3	2
10	22.1	3	16.6	-15	0	2	1	-3
11	17.9	1	13.4	-6	1	1	-4	-12
12	14.2	1	10.6	1	1	-4	-15	-28
13	11.7	2	8.7	4	-3	-14	-31	...
14	10.0	6	7.4	3	-10	-27	...	...
15	9.4	16	6.9	3	-17	-38	...	...
16	9.7	25	7.1	7	-16	-39	...	...
17	10.2	27	7.5	10	-12	-35	...	...
18	10.6	29	8.0	13	-9	-30	...	...
19	9.9	31	7.5	9	-16	...	...	...
20	9.1	31	6.9	4	-24	...	...	...
21	8.9	31	6.9	3	-26	...	...	...
22	11.8	29	9.2	19	0	-19	...	...
23	15.0	26	11.6	28	16	4	-12	-30
24	19.7	19	14.9	25	22	16	7	-3

VK STH - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.2	19	14.6	23	21	16	7	-2
2	18.9	10	14.3	6	11	9	3	-4
3	21.0	5	16.6	-9	3	5	4	-1
4	23.8	4	18.0	-20	-2	3	4	2
5	25.4	4	19.6	-27	-6	1	4	3
6	26.0	4	20.4	-31	-8	0	3	3
7	26.3	4	21.0	-33	-9	0	3	3
8	27.6	4	22.4	-32	-8	0	3	3
9	27.6	3	20.9	-26	-6	1	3	2
10	25.0	3	19.0	-17	-1	3	3	0
11	21.5	4	16.2	-7	3	4	1	-5
12	18.1	5	13.7	0	5	2	-5	-15
13	15.0	6	11.3	6	3	-3	-16	-31
14	12.8	10	9.6	9	0	-13	-31	...
15	11.1	17	8.3	9	-8	-26	...	...
16	10.4	24	7.8	8	-14	-37	...	...
17	10.4	26	7.9	9	-15	-38	...	...
18	10.5	28	7.9	10	-13	-37	...	...
19	10.8	29	8.1	12	-12	-35	...	...
20	9.8	30	7.4	6	-21	...	...	...
21	8.6	31	6.6	-3	-36	...	...	...
22	8.4	31	6.5	-5	-39	...	...	...
23	11.7	28	8.8	17	-4	-24	...	...
24	17.5	23	13.4	32	21	11	-3	-19

VK WEST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.7	16	13.4	14	17	15	10	3
2	18.9	17	12.9	17	18	15	9	2
3	18.1	19	12.4	20	19	15	8	0
4	17.2	23	11.8	26	21	16	7	-3
5	17.3	23	12.0	26	22	16	7	-2
6	17.7	23	12.3	27	23	17	8	-1
7	19.0	22	13.2	25	23	18	11	2
8	17.6	14	13.1	15	14	9	0	-10
9	14.0	5	10.4	5	4	-1	-11	-24
10	11.5	-8	8.5	0	-1	-7	-18	-32
11	9.8	-24	7.2	-3	-3	-9	-20	-34
12	9.2	...	6.7	-16	-14	-20	-32	...
13	9.4	...	7.0	-27	-21	-25	-37	...
14	9.8	...	7.2	-33	-24	-27	-37	...
15	10.2	...	7.6	-37	-26	-27	-36	...
16	9.5	...	7.1	...	-37	-39	...	...
17	8.7	...	6.6	...	...	...	...	...
18	8.6	...	6.6	...	...	...	...	...
19	11.2	...	8.2	-27	-16	-16	-23	-33
20	16.4	-9	12.6	-19	-5	-3	-5	-10
21	21.4	2	14.7	-19	-3	2	2	0
22	21.2	8	14.6	-7	5	8	7	4
23	21.0	12	14.3	3	11	12	9	5
24	20.4	14	13.9	10	15	14	10	5

VK EAST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.2	13	12.6	9	13	11	6	-1
2	17.4	17	12.1	16	16	12	5	-3
3	16.8	20	11.7	21	18	13	4	-6
4	16.1	23	11.3	25	20	13	2	-9
5	16.3	24	11.5	27	21	14	3	-8
6	16.5	23	11.8	25	20	14	4	-7
7	17.6	22	12.6	25	21	16	7	-3
8	16.8	14	13.1	15	12	6	-4	-17
9	13.5	6	10.5	6	3	-4	-17	-32
10	11.2	-5	8.7	1	-2	-10	-24	...
11	9.9	-17	7.6	-1	-4	-12	-25	...
12	9.5	-36	7.3	-10	-10	-18	-31	...
13	9.7	...	7.6	-22	-19	-25	-38	...
14	9.9	...	7.6	-33	-26	-31	...	...
15	10.2	...	7.8	...	-33	-35	...	...
16	9.4	...	7.3	...	...	...	...	...
17	8.7	...	6.8	...	...	...	...	...
18	8.6	...	6.7	...	...	...	...	...
19	10.5	...	8.0	...	...	...	...	...
20	14.4	-21	11.4	-21	-8	-5	-8	-14
21	19.8	-6	14.1	-29	-10	-4	-3	-6
22	19.8	-3	13.9	-27	-7	-1	0	-1
23	19.4	1	13.5	-15	-1	3	2	0
24	18.8	8	13.1	-1	7	8	5	0

VK STH - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.5	2	12.2	-5	2	3	0	-6
2	16.7	6	11.7	3	7	5	0	-8
3	16.1	9	11.4	7	9	5	-1	-10
4	15.5	12	11.0	11	10	5	-2	-13
5	15.7	13	11.3	12	11	6	-2	-12
6	16.0	14	11.5	14	12	7	-1	-11
7	16.9	14	12.3	13	13	9	2	-7
8	18.2	13	13.2	12	13	11	5	-3
9	18.6	10	13.5	8	10	8	2	-6
10	16.6	3	12.9	0	3	0	-7	-17
11	13.3	-7	10.3	-4	-2	-6	-15	-27
12	11.1	-20	8.5	-6	-4	-9	-19	-32
13	9.7	...	7.4	-19	-17	-22	-34	...
14	9.4	...	7.1	-36	-30	-35	...	...
15	9.5	...	7.4	...	-38	...	...	...
16	9.8	...	7.4	...	...	...	...	...
17	10.0	...	7.6	...	...	...	...	...
18	9.3	...	7.1	...	...	...	...	...
19	8.6	...	6.7	...	...	...	...	...
20	8.4	...	6.6	...	...	...	...	...
21	10.4	...	7.8	...	-36	-37	...	...
22	14.3	-19	11.4	-20	-8	-6	-9	-15
23	18.6	-7	13.1	-24	-8	-4	-4	-8
24	18.1	-3	12.7	-17	-3	0	-1	-5

VK WEST - EUROPE L.P.

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.1	5	8.1	5	-7	-21	...	...
2	9.7	-4	7.4	2	-7	-19	-39	...
3	9.3	-13	7.2	0	-8	-19	-38	...
4	13.4	-3	10.4	-1	0	-4	-14	-28
5	21.6	4	16.7	-8	3	4	2	-3
6	28.9	5	22.2	-13	3	7	8	6
7	27.4	5	20.5	-11	3	7	7	4
8	24.3	6	18.2	-5	6	8	6	1
9	20.4	6	15.3	0	6	6	1	-6
10	16.6	6	12.4	3	5	2	-6	-17
11	13.3	4	9.9	5	2	-5	-18	-34
12	10.9	5	8.1	6	-3	-15	-34	...
13	9.4	9	7.0	5	-10	-27	...	...
14	8.9	19	6.6	5	-15	-36	...	...
15	9.2	27	6.7	8	-14	-36	...	...
16	9.6	30	7.1	11	-11	-33	...	...
17	9.5	31	7.3	11	-13	-36	...	...
18	9.2	33	6.9	9	-16	...	...	...
19	8.4	34	6.4	5	-22	...	...	...
20	8.3	34	6.4	4	-23	...	...	...
21	9.8	32	7.5	12	-11	-33	...	...
22	9.1	30	7.0	7	-17	...	...	...
23	8.4	19	6.5	2	-21	...	...	...
24	8.2	7	6.5	0	-20	...	...	...

VK STH - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.8	18	7.5	9	-8	-27	...	...
2	9.5	9	7.3	5	-10	-27	...	...
3	13.7	11	10.1	11	5	-3	-17	-34
4	21.8	11	16.8	11	14	12	7	-1
5	28.8	8	22.7	1	11	15	12	8
6	31.1	7	25.1	-4	9	12	12	10
7	29.5	7	23.6	-4	8	11	11	8
8	27.0	7	21.5	-1	9	11	9	5
9	23.7	8	18.8	3	10	10	6	0
10	20.2	8	15.8	6	10	7	1	-8
11	16.7	9	13.0	9	8	2	-7	-20
12	13.4	10	10.4	10	3	-7	-22	...
13	11.4	12	8.8	9	-3	-17	-38	...
14	10.3	20	7.9	9	-9	-28	...	...
15	10.1	26	7.8	10	-11	-31	...	...
16	10.3	28	7.8	12	-10	-31	...	...
17	10.2	30	7.8	13	-9	-30	...	...
18	9.9	32	7.5	12	-11	-33	...	...
19	9.7	32	7.5	10	-14	-38	...	...
20	9.1	32	7.1	6	-21	...	...	...
21	8.9	32	7.0	5	-23	...	...	...
22	9.7	32	7.5	11	-12	-35	...	...
23	9.0	30	7.0	7	-18	...	...	...
24	8.8	24	6.9	5	-19	...	...	...

VK WEST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.4	23	6.5	3	-21	...	...	...
2	9.5	13	7.4	6	-10	-29	...	...
3	13.9	12	10.4	12	6	-3	-17	-34
4	22.4	11	17.4	11	14	13	7	0
5	29.5	8	22.5	1	11	14	13	9
6	32.2	6	24.3	-5	8	12	13	11
7	31.8	6	23.8	-8	7	11	12	10
8	30.2	6	22.6	-7	6	10	11	8
9	27.7	7	20.7	-4	8	10	9	6
10	24.5	8	18.4	2	10	11	8	2
11	20.5	10	15.4	8	12	9	3	-6
12	16.7	12	12.5	12	10	4	-6	-20
13	13.3	16	9.9	15	5	-6	-23	...
14	10.9	22	8.1	13	-3	-20	...	...
15	9.4	28	7.0	9	-14	-36	...	...
16	8.9	31	6.6	7	-19	...	...	...
17	9.2	33	6.9	9	-16	...	...	...
18	9.6	34	7.1	12	-13	-36	...	...
19	8.8	35	6.5	8	-19	...	...	...
20	9.1	35	6.7	10	-16	...	...	...
21	8.5	35	6.5	5	-23	...	...	...
22	8.4	35	6.5	4	-25	...	...	...
23	9.4	34	7.1	11	-14	-37	...	...
24	8.5	34	6.5	5	-22	...	...	...

VK EAST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	31.1	12	25.2	-3	11	15	16	14
2	29.9	11	24.6	-5	9	14	15	13
3	29.3	11	22.3	-6	9	13	14	12
4	29.3	11	23.9	-5	9	14	14	12
5	29.4	12	24.0	-2	11	15	15	13
6	30.2	11	23.4	3	14	17	16	13
7	28.9	11	22.1	11	19	19	17	12
8	26.5	14	20.1	23	24	22	17	9
9	24.2	17	18.5	33	29	24	15	5
10	21.7	19	16.6	36	29	20	9	-3
11	19.8	20	15.1	36	25	16	2	-13
12	18.2	21	13.8	34	22	10	-5	-23
13	17.2	22	13.0	33	19	6	-11	-31
14	16.4	23	12.5	31	16	2	-17	-39
15	15.4	24	11.7	28	12	-4	-25	...
16	14.7	24	11.2	26	8	-8	-31	...
17	12.8	26	9.8	19	-4	-25	...	...
18	10.5	27	8.1	4	-26	...	...	...
19	10.0	28	7.7	0	-33	...	...	...
20	14.5	24	10.9	25	7	-10	-34	...
21	21.3	20	16.7	32	27	20	11	0
22	27.8	16	21.5	17	23	23	20	15
23	31.9	14	25.0	8	18	21	20	18
24	32.7	12	25.8	1	14	18	18	16

VK STH - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.3	10	22.0	-5	8	12	12	9
2	26.7	10	21.9	-8	6	10	11	8
3	26.5	9	20.2	-9	5	10	10	7
4	26.7	9	22.2	-9	6	10	10	8
5	26.9	10	22.2	-6	8	11	12	9
6	27.6	10	21.7	-1	10	13	12	9
7	26.6	9	20.1	6	14	14	11	6
8	23.9	11	18.0	17	18	16	9	1
9	20.2	15	15.2	26	20	12	1	-12
10	16.6	18	12.5	26	13	0	-18	-38
11	13.5	20	10.2	17	-2	-21	...	...
12	11.2	22	8.4	6	-22	...	...	...
13	9.6	24	7.2	-7	...	...	...	...
14	8.9	26	6.7	-16	...	...	...	...
15	9.1	26	6.8	-14	...	...	...	...
16	9.4	25	7.1	-10	...	...	...	...
17	9.8	25	7.4	-6	...	...	...	...
18	9.0	26	6.9	-15	...	...	...	...
19	8.1	26	6.2	-28	...	...	...	...
20	7.9	26	6.1	-31	...	...	...	...
21	11.0	24	8.5	4	-25	...	...	...
22	16.6	9	12.9	11	6	-2	-16	-33
23	23.0	8	17.7	6	11	10	5	-2
24	27.4	8	21.0	0	10	12	11	7

VK WEST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	32.5	11	25.0	3	15	18	18	15
2	31.1	13	25.2	-1	12	16	17	15
3	29.8	12	24.4	-4	10	15	15	13
4	28.9	12	23.9	-5	9	14	14	12
5	28.9	12	24.0	-4	10	14	14	12
6	29.0	12	23.9	-1	12	15	15	13
7	29.7	12	23.8	3	15	17	17	14
8	29.9	11	22.8	10	18	19	17	13
9	27.8	13	21.2	21	24	22	18	12
10	24.8	18	18.8	39	33	26	17	7
11	22.1	19	16.8	38	30	21	10	-3
12	19.3	20	14.7	36	24	13	-2	-18
13	17.2	21	13.0	32	17	3	-15	-35
14	15.5	22	11.7	27	10	-6	-29	...
15	14.5	22	11.0	24	4	-14	-39	...
16	13.9	23	10.7	21	0	-19	...	...
17	13.4	23	10.2	19	-3	-24	...	...
18	13.1	23	10.0	18	-5	-27	...	...
19	11.6	24	8.9	8	-20	...	...	...
20	9.8	25	7.5	-7	...	...	...	...
21	9.4	25	7.3	-11	...	...	...	...
22	13.5	16	10.2	14	-3	-21	...	...
23	21.4	12	16.6	18	17	12	4	-7
24	28.6	11	22.1	10	17	18	16	11

VK EAST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.5	6	22.0	-32	-8	1	5	6
2	25.7	8	20.7	-19	0	6	8	7
3	25.0	13	20.0	-3	10	13	13	10
4	24.6	18	19.6	14	20	20	17	13
5	24.8	22	19.7	29	29	27	22	16
6	24.8	23	19.6	37	34	30	23	16
7	24.5	20	19.0	38	33	27	19	10
8	22.1	21	16.7	38	30	23	13	2
9	19.2	23	14.5	36	26	17	5	-8
10	16.9	25	12.7	33	21	10	-4	-21
11	15.1	27	11.3	30	16	3	-14	-34
12	14.0	28	10.5	27	12	-2	-22	...
13	13.4	24	10.0	22	8	-5	-25	...
14	12.9	16	9.7	14	4	-8	-26	...
15	12.7	8	9.6	8	1	-9	-25	...
16	11.2	-4	8.5	1	-4	-13	-29	...
17	9.5	-20	7.3	-2	-7	-17	-34	...
18	9.2	-32	7.1	-5	-7	-16	-31	...
19	13.2	-16	10.2	-11	-4	-6	-14	-24
20	20.9	-2	16.1	-25	-7	-2	-2	-6
21	26.9	2	21.6	-37	-12	-3	1	1
22	27.2	3	22.3	...	-15	-4	2	4
23	27.0	3	22.0	...	-14	-4	2	4
24	26.9	4	21.9	...	-12	-2	3	4

VK STH - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.4	8	23.6	-29	-5	3	7	8
2	27.4	11	22.1	-14	3	9	12	11
3	26.5	15	21.3	4	14	17	16	14
4	26.1	20	20.8	21	25	24	21	17
5	26.3	23	20.9	33	32	30	25	19
6	26.4	20	20.4	38	34	30	23	15
7	22.8	21	17.0	38	31	24	15	5
8	18.4	24	13.7	35	25	15	3	-11
9	14.6	27	10.9	29	15	1	-16	-37
10	11.9	30	8.8	21	2	-15	...	...
11	10.0	31	7.4	12	-11	-34	...	...
12	9.3	32	6.8	8	-18	...	...	...
13	9.6	25	7.2	8	-14	-36	...	...
14	10.1	13	7.5	7	-8	-25	...	...
15	10.6	4	7.9	5	-5	-18	-39	...
16	9.8	-9	7.4	0	-7	-19	-37	...
17	9.0	-23	6.8	-2	-7	-18	-35	...
18	8.9	-39	6.8	-8	-11	-20	-36	...
19	12.0	-19	8.8	-8	-3	-7	-18	-28
20	17.9	-5	13.8	-19	-5	-2	-4	-10
21	25.0	1	19.2	-31	-9	-1	1	0
22	29.3	3	23.2	-39	-12	-2	3	4
23	29.2	6	23.8	...	-13	-2	4	6
24	29.1	7	23.6	-38	-11	0	5	7

VK WEST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.2	4	21.7	...	-14	-3	3	5
2	25.3	6	20.4	-34	-8	1	5	6
3	24.7	9	19.8	-21	0	6	9	8
4	24.3	13	19.4	-6	8	12	13	10
5	24.5	18	19.4	8	17	19	17	14
6	24.4	22	19.3	23	26	25	22	16
7	24.0	25	19.4	33	32	29	24	18
8	23.0	28	17.9	39	35	31	24	16
9	21.9	24	16.6	39	32	26	16	6
10	17.8	27	13.4	36	26	17	4	-10
11	14.2	30	10.6	30	16	3	-15	-35
12	11.5	33	8.6	22	4	-13	-38	...
13	9.7	28	7.2	13	-8	-29	...	...
14	9.0	13	6.7	6	-11	-30	...	...
15	9.4	4	7.1	6	-7	-22	...	...
16	10.0	-6	7.4	3	-3	-14	-31	...
17	10.5	-11	7.9	1	-1	-9	-23	...
18	9.8	-23	7.4	-1	-2	-9	-21	-37
19	8.9	...	6.8	-15	-15	-23	-38	...
20	8.8	...	6.8	-29	-26	-33	...	...
21	12.1	-28	9.0	-14	-5	-5	-11	-20
22	18.2	-8	14.0	-27	-8	-2	-2	-6
23	25.3	0	19.4	...	-14	-4	0	0
24	26.5	3	21.6	...	-17	-5	2	4

VK EAST - USA/CARRIBBEAN

VK STH - USA/CARRIBBEAN

VK WEST - USA/CARRIBBEAN

HAMADS

TRADE HAMADS

● AMIDON ferromagnetic cores: for LF/HF/VHF/UHF applications. Send DL size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office please . . . 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscott Electronics, Melbourne.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high resolution s/wave weather fax, morse & RTTY receiving program. Needs CGA, SSBhf radio & RADFAX decoder. Also RF2HERC, RF2EGA and RF2VGA, same as RADFAX2 but suitable for Hercules, EGA and VGA cards respectively, $35. SATFAX is a NOAA, Meteor and GMS weather satellite picture receiving program. Uses EGA or VCA modes. Needs EGA or VGA colour monitor and card, & Weather Fax PC card, and 137MHz receiver, $45. All programs are on 5.25" or 3.5" disks (state which) & documentation, add $3 postage. Only from M Delahunty, 42 Villiers St, New Farm, Qld 4005. Ph (07) 358 2785.

FOR SALE - NSW

● REALISTIC 10m SSB/CW transceiver, manual, mic, carton, HTX-100, 5/25 watts, $200. VK2AIQ (075) 24 9772.

● COMMUNICATIONS TOWER 20m free-standing tilt over galvanised tower CW Moeley triband beam KR400 rotator $2200. FL2100Z WARC linear $1100. TS600 6m transceiver $350. All in GC. VK2BKG QTHR.

● YAESU FRG7000 com receiver, 250kHz-30MHz, ditigal, synthesised, 24hr digital clock and timer, ser no 8H020985, EC, handbook, $325 ono. Ken VK2ATK QTHR (02) 809 4000.

● YAESU YD148 desk mic, used once, $50. Merv VK2ZD QTHR (02) 427 3281.

● TEN-TEC PARAGON all mode txvr WARC bands all filters & Turner desk mike $1750 ono. Electronic morsekeyer (CMOS) $90. Paddle (CHROME) $75. Keyer board assmb and tested $65. Keyerkit $45. Kenwood hand mikes (1) MC45 (1) MC46, make an offer. Ben VK2DZD QTHR (047) 54 2299 after 6pm.

● ANTENNA TRIBAND HB33DX TET-Emtron, hardly used, $350 ono. Allan VK2FH QTHR (02) 969 8703.

● TWO RF CONCEPTS "fourth generation" solid state power amplifiers. They both feature state of the art Gas-Fet prsamps, variable SSB delay, high SWR protection, over temperature protection, automatic or remote keying, and remote control. They both work with all modes of transmission including FM, CW and SSB. 143-149MHz, input 200 MW to 50 watts, output 170 watts, 430-450MHz, input 500Mw to 40 watts, output 100 watts. Brand new, $695 ea. VK2XTQ QTHR (02) 371 0745.

● YAESU FT101E, GC, with spare tubes and manual S/N351433, $450 ono. Phil VK2JR.

● MFJ 1224 computer interface. Plug pack included. Wired to suit VIC20 at the moment. VIC20 software. $150. Siemens M100 teleprinter (brown case) iN VGC with RTTY modems 730/731, plus auto start. Modems and power supply completely installed, $50. Tony VK2CAM (02) 638 3569.

● FT101E, GC, S/No 8F350137, operating manual and still in original carton, $460. VK2MUZ QTHR (069) 25 4878.

● CRO BWD dual trace 539A, 10MHz B/W TV triggering, CW two probes, handbook, in original carton, $300 ono. Lloyd VK2ELB QTHR (02) 639 7007.

● ICOM IC551D 100w 6m all-mode txvr with matching IC-PS20 power supply/speaker. Icom Mike, handbook, as new cond. $750 or offer. Consider swap for HF txvr in EC. Ian VK2JCW (02) 634 7210.

● ICOM IC-2SAT 2M FM H/H txvr complete unit in original box, almost new, 48 memories DTMF, still under warranty, $470 ono. Contact Asim VK2XVE (02) 313 6821.

● COLLECTOR'S Item. AWA AT 21 transmitter C/W separate power supply. ATU built-in. VGC. Spare valves available. Offers to Alex VK2DV QTHR (065) 82 1301.

● FTD-401 transceiver, new driver and finals. Outboard speaker. No mike. Complete with Ham-Preselector SX-59, $400 ono. Can be converted into a linear inst/man and carton. MFJ1224 computer interface. Plug pack included. Wired to suit VIC20 at the moment. VIC20 software. $150. Siemens M100 teleprinter (brown case) in VGC with RTTY modems 730/731 plus auto start. Modems and power supply completely installed $50. Tony VK2CAM (02) 638 3569.

FOR SALE - VIC

● ELECTRICAL & TELEPHONE equipment, cable, tools, hardware and accessories C64 computer, drills, electrical testers, batteries and heaps of good bargains. Approx $12,000 worth of goods must be sold. For inventory copy, please phone Evan VK3EJV (03) 438 2878 AH.

● ICOM IC745 HF tcvr, all mode inc FM gen cov receiver, with ICOM desk mic, instr book etc. EC, $1250. EAT-300 ATU, EC, $150. Ron VK3OM QTHR (059) 44 3019.

● SHACK CLEAN OUT fifty years. Some parts irreplaceable mine for hobbyist, home brewer, experimenter, some parts worth more than $50 the lot. VK3ALN QTHR (03) 802 4156.

● SOLAR BASIC computer power regulator. Input 230vac 10 amp output, 115V AC 18 amps. VK3DBZ. (03) 898 4062.

● YAESU YD148 desk microphone, golfball type, $50. Katsumi CW paddle keyer with memory, $100. Also Chimside 10/15/20 vertical antennas, as new, $90. Tom VK3NWY (03) 866 2356 or (03) 699 7200 (bus).

● ICOM IC451E all mode 70cm tcvr ser no 1641 plus, 50W 70cm linear amplifier, both VGC, $640. Also 70cm beam antenna $30. Will not separate. Licensed amateurs only. VK3DVT (03) 592 6236.

● TYPE 'S' HEAVY DUTY power supply including leads and sockets and spare 866s $30. Coils, all sizes, inc silver-plated AR7RX including all coil boxes, c/w handbook, power supply modified for SSB use, $35. AR7 dial mechanism $10. PC, Hewlett Packard wavemeter 55 to 400MHz, $16. Used power transformers and power supplies low to high voltage, inc 2 neon 10-12 KVTXs. Commercial valve transceivers with transistor power supply and mic. Weston, Pye, Crammohd, Vinten, from $17.50. Crytals 'D' type and FT243 plus miniature, $1 ea. Some sets avail same freq 100kHz, 500kHz and marker crystals, PMG key. 6.0MHz Xtal filter, free switches, pots, IFs, audio TXs, radios etc, for wrecking, mags free to all buyers, reasonable offers accepted. Don VK3ADI BH (03) 882 0020, AH (03) 859 5593.

● FT230R 2 Mx FM TXVR mob and base, 10/25 watt, memories, rptr, offset, memory split and scan, full instr manual, mint hours and condx. VK3ALT QTHR (059) 41 1248.

● RACKS 19ins by 6ft with doors, 2 for $35 each. One for $45. Instrumentation tape decks, rack mounting, not going, half-inch $80, one-inch $45. Many spares, info. Arnold VK3AGW (03) 754 4111 AH.

● TONO model 350 comm'ss computer Morse, baudot, ASCII, manual supplied, $200, plus National dee printer LA100 floor model spare head ribbons and manual, $200. Will QTHR (052) 43 5220 VK3WCW.

● KENWOOD TS940S has CW filters, voice synthesiers unit fitted with SP940 external speaker EC, $3200 ono. Ray VK3CDR (03) 726 9222 after 6pm.

FOR SALE - QLD

● SHACK CLEAN OUT: old valves, test equipment, bits and pieces, send SAE with your wanted list and I will send list of items I have for sale. VK4DY QTHR.

● YAESU FRG7 receiver, GC, 12/110volt works great from 12/240 adaptor or mobile, $200 ono. Kenwood 120 transceiver 12V ideal for mobile. Cabinet, fair, works well though, $450 ono. Len VK4BIH QTHR (07) 396 3650.

● WORK THE WORLD from the great DX position on hilltop, small cottage on 1/4-acre freehold block at Mount Larcom, 20 mins Gladstone. Ideal for large antennas, HF and 2m antennas included, $43,500. Roy VK4CAT (079) 75 1360.

● TH3JR Hi-Gain 10/15/20m 8dB gain 25dB FB beam. ATN 144/148 VHF log 11-element beam 14.5dBi gain. Geoff VK4CET (077) 23 1453 AH.

FOR SALE - SA

● CLIPPERTON L Linear four 572B tubes, very little use, one owner from new, 1.8 to 30MHz including 10MHz option. John Ruston VK5ARK QTHR (085) 86 6127.

FOR SALE WA

● FULL SIZE 20m Hi-Gain beam, $250. Transformer 5000v input 250v 2500/2500 CT current 2.5 amps $150. Tested. VK6TP QTHR (09) 299 6741.

● YAESU FT101Z in VGC with h/book, mic and packing case. Very little used. $400 ono. Con VK6PM QTHR (097) 33 1978.

FOR SALE - TAS

● FT101E EC, new, finals plus spare pwr trans and box of bits from old FT101B, $450. FRG-7 xtal filt $300. FTV650 6M tvtr, IC202. Both small faults, $60 ea. (002) 67 2356 AH.

● YAESU FT-620 6m txvr, VGC, $350. Damien VK7CDI (003) 95 4153.

● FT7 GC with mic and home brew p.supply, $350. FT-DX-100 with Yaesu desk mic, offer estate late VK7NBC. Athol VK7LR QTHR (004) 24 2525.

WANTED - NSW

● COLLING KWM2 or KWM-2A xcvr, Collins S-Line. Details to VK20E, PO Box 1914, Wollongong NSW 2500.

WANTED - VIC

● PA3 DC-DC adaptor for FT208R. Jack VK3LG QTHR (03) 807 2633.

● WWII ARN-7 radio compass control box C4/ARV-7 also front panel 22 pin female plug PL122 FOR ABOVE. VK3DBZ (03) 898 4062..

● ICOM txrx IC735 IC751A also ATU Icom AT150 AT500 mike Icom SM8 plus manual tune ATU. Ken VK3MDF (H) (051) 52 3984. (W) (051) 52 3354.

● COPY of operating manual or similar information for Pye T/ceiver VK3PTV (03) 729 1513.

WANTED - QLD

● 2MTR FM TXVR, prefer Kenwood TR7950 TM2570A TM2550 TM231A. Ph (071) 25 3415 or write Clarrie Stennett, 1/19 Limpus St, Hervey Bay 4655. Any reasonable price.

● MEMORY UNIT for Yaesu FT902D. ALAN VK4FVA QTHR (077) 75 2747.

● AT130 Kenwood ATU. Geoff VK4CET. (077) 23 1453 AH.

● COPY FRG-7 circuit diagram. VK4BKM Keith (074) 86 4340 QTHR.

WANTED - TAS

● HF Transceiver with gen coverage receiver, prefer ICOM and PSU to suit. (002) 67 2356 AH.

WANTED - WA

● YAESU remote antenna selector, FAS-1-4R Kenwood mobile bracket for TS120/130 MB100. VK6PY Paul QTHR (09) 275 1617.

● INTRUDER WATCH observer in VK6. Free tape, logs, postage and advice. Please help. Contact Graham VK6RO QTHR (09) 451 3561.

● VARIABLE CAPACITORS around 200PF Command TX type etc. Also 1 and 2 gang old b'cast type around 365PF to suit antenna tuners. VK6ABS QTHR (090) 75 4136.

● TOWER 9M HIGH, preferably crank-up/tilt-over type, to support 3-element 20m beam. Perth area, please. Steve VK6VZ (09) 349 9703.

Satellite Activity for February/March 1991

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1991-							
013A	COSMOS 2135	26 Feb	USSR	104.5	1034	953	82.8
014A	RADUGA 27	28 Feb	USSR	1396.0	34994		1.4
015B	MOP-2	02 Mar	ESA	1431.6	35963	35433	1.1
015A	ASTRA 1B	02 Mar	ESA	717.5	35853	4534	3.9
016A	COSMOS 2136	06 Mar	USSR	90.2	336	257	62.9
017A	USA 69	08 Mar	USA				
018A	IMMARSAT-2	08 Mar	USA				
019A	NADESHDA-3	12 Mar	USSR				
020A	PROGRESS M-7	19 Mar	USSR	88.4	230	190	51.6
021A	COSMOS 2137	19 Mar	USSR	94.0	495	448	65.8
022A	MOLNIYA 3-40	22 Mar	USSR	11h41m	39082	468	62.8

2. Returns

During the period 52 objects decayed, including the following satellites:

1981-100A	SME	05 Mar
1990-081B	PRC 31	11 Mar
1991-002A	PROGRESS M-6	15 Mar
1991-016A	COSMOS 2136	20 Mar
1991-004A	COCMOS 2121	10 Feb

BOB ARNOLD VK3ZBB

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

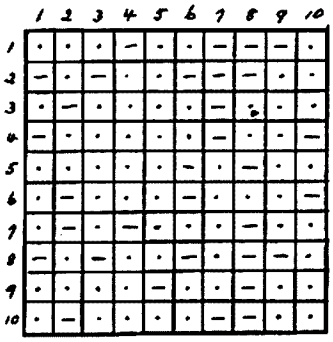
*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 51



Across: 1 snag; 2 cage; 3 rile; 4 belt; 5 hare; 6 last; 7 entire; 8 cap; 9 said; 10 ripe
Down: 1 arid; 2 fax; 3 lied; 4 bib; 5 heir; 6 race; 7 onset; 8 grot; 9 there; 10 vase

TRADE PRACTICES ACT
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.

VICTORIAN CONSUMER AFFAIRS ACT
All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the boxholder or seller of the goods.

TYPESETTING : Magazine Graphics, PO Box 72, Caulfield Sth, 3162, Ph: 399 9525

PRINTING: Rural Press, Gisborne

MAIL DISTRIBUTION: R L Polk & Co Pty Ltd, PO Box 140, Collingwood, Vic. 3066, Tel:(03) 417 5161

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HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

.....

Call Sign (if applicable): .....

Address: .....

.....

.....

State and Postcode: .....

WIA Slow Morse Transmissions

VK2BWI nightly at 2000 local on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3RCW Continuous on 144.950 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WII Tuesday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 0930 UTC on 3535 kHz

VK4WIS Nightlyat 0900 UTC on 3542 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200UTC on 3.555 MHz

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division

	Ref	Price to Members
ANTENNA BOOKS		
Ant. Compendium Vol 2 Software only	BX293	$18.00
Antenna Compendium Vol 1 ARRL	BX163	$19.80
Antenna Compendium Vol 2 & Software ARRL	BX294	$32.40
Antenna Compendium Vol 2 ARRL	BX292	$21.60
Antenna Handbook - Orr	BX217	$15.57
Antenna Impedance Matching - ARRL	BX257	$27.00
Antenna Note Book W1FB - ARRL	BX179	$18.00
Antenna Pattern Worksheets Pkt of 10 - ARRL	BX211	$5.40
Antennas 2nd ed John Kraus	BX259	$93.60
Beam Antenna Handbook - New ED. 1990 Orr	BX215	$17.37
Cubical Quad Antennas - Orr	BX214	$13.05
HF Antennas - Moxon RSGB	BX188	$27.00
Novice Antenna Notebook DeMaw - ARRL	BX162	$14.40
Practical Wire Antennas - RSGB	BX296	$25.20
Reflections - Software 5 in disk	BX358	$18.00
Reflections - Transmission lines The Book - ARRL	BX348	$36.00
Smith Chart Expanded Scale PK of 10	BX903	$5.94
Smith Charts Stand Scale SET Co-or. PK of 10	BX900	$5.94
The Antenna Handbook - ARRL	BX161	$32.40
The Truth About CB Antennas - Orr	BX219	$15.57
Transmission Line Transformers - ARRL	BX329	$36.00
Vertical Antenna Handbook - Lee	BX284	$16.65
Vertical Antennas - Orr	BX220	$14.27
Yagi Antenna Design - ARRL	BX164	$27.00
ATV BOOKS		
Micro and Television Projects - BATC	BX272	$9.45
The ATV Compendium - BATC	BX270	$15.75
The Best Of CO-TV - BATC	BX273	$15.75
The Slow Scan Companion - BATC	BX274	$11.70
TV For Amateurs - BATC	BX271	$8.32
CALL BOOKS		
Radio Call Book International 1991	BX339	$56.25
Radio Call Book North America 1991	BX338	$52.65
Radio Call Book Supplements 1991 Due June	BX364	$15.75
FICTION		
CO Brings Danger - ARRL	BX206	$9.45
CQ Ghost Ship - ARRL	BX204	$9.45
Death Valley OTH - ARRL	BX205	$9.45
Grand Canyon DSO - ARRL	BX207	$9.45
Murder By QRM - ARRL	BX208	$9.45
SOS At Midnight - ARRL	BX209	$9.45
Space Almanac - ARRL	BX299	$36.00
HANDBOOKS		
1991 ARRL Handbook	BX337	$47.61
Electronics Data Book - ARRL	BX201	$21.60
Motorola RF Device Data - 2 Volumes	BX47	$22.05
Operating Manual - ARRL	BX192	$27.00
Operating Manual - RSGB	BX359	$25.20
Radio Communication Handbook - RSGB	BX266	$50.40
Radio Data Reference Book - RSGB	BX189	$32.40
Radio Handbook 23rd edition - Bill Orr	BX224	$53.91
Radio Theory For Amateur Operators - Swainston	BX265	$38.66
HISTORY		
200 Meters and Down 1936 - ARRL	BX198	$7.20
50 Years of the ARRL	BX196	$7.20
Big Ear - Autobiography Of John Kraus W8JK	BX363	$11.25
Golden Classics of Yesterday - Ingram	MFJ30	$18.45
Spark to Space - ARRL 75th Anniversary	BX310	$36.00
INTERFERENCE BOOKS		
Interference Handbook - Nelson	BX181	$16.02
Radio Frequency Interference - ARRL	BX186	$8.55
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX44	$7.65
Design Notebook W1FR - ARRL	BX357	$18.00
DX Power - K5RSG	BX356	$18.00
Help For New Hams DeMaw - ARRL	BX308	$18.00
Hints and Kinks 12th edition - ARRL	BX330	$14.40
Novice Notes, The Book - ARRL QST	BX298	$10.80
Passport to World Band Radio 1991	BX346	$30.60
QRP Classics - ARRL OST	BX323	$21.60
QRP Note Book - DeMaw ARRL	BX170	$10.80
Radio Astronomy 2nd edition - John D Kraus	BX262	$71.91
Short Wave Propagation Handbook	BX268	$16.65
Shortwave Receivers Past and Present	BX253	$15.84

	Ref	Price to Members
MISCELLANEOUS cont.		
Solid State Design - DeMaw ARRL	BX171	$21.60
Spread Spectrum Source Book - ARRL	BX365	$36.00
MORSE CODE		
Advanced Morse Tutor - 3.5 inch Disk	BX328	$27.00
Advanced Morse Tutor - 5.25 inch Disk	BX328	$27.00
Morse Code 2 Tapes Novice Code Course - Gordon Wesl	BX228	$17.91
Morse Code 6 Tapes 13-20 WPM Code Course - Gordon West	BX231	$63.90
Morse Code 6 Tapes 5-13 WPM Code Course - Gordon West	BX230	$63.90
Morse Code 6 Tapes Novice Code Course - Gordon Wesl	BX229	$63.90
Morse Code Tapes Set 1: 5-10 WPM - ARRL	BX331	$16.65
Morse Code Tapes Set 2: 10-15 WPM - ARRL	BX332	$16.65
Morse Code Tapes Set 3: 15-22 WPM - ARRL	BX333	$16.65
Morse Code Tapes Set 4: 13-14 WPM - ARRL	BX334	$16.65
Morse Tutor 5.25 inch IBM Disk	BX187	$18.00
OPERATING		
Amateur Radio Awards Book - RSGB	BX297	$27.00
DXCC Companion	BX345	$10.80
Low Band DXing - John Devoldere	BX195	$18.00
Maidenhead Locator-Grid Atlas - ARRL	BX197	$9.00
Prefix Map - The World Flat on Heavy Paper	BX335	$14.40
Prefix Map of North America	BX235	$7.20
Prefix Map of The World	BX234	$7.20
Radio Amateurs World Map	BX236	$7.20
The Complete OXer - Bob Locher	BX194	$18.00
Transmitter Hunting - TAB	BX222	$32.31
PACKET RADIO BOOKS		
AX.25 Link Layer Protocol - ARRL	BX178	$14.40
Computer Networking Con (Packet) No 5 1986 - ARRL	BX167	$18.00
Computer Networking Con (Packet) No 6 1987 - ARRL	BX168	$18.00
Computer Networking Con (Packet) No 7 1988 - ARRL	BX184	$22.50
Computer Networking Con (Packet) No 8 1989 - ARRL	BX295	$21.60
Computer Networking Con (Packet) No 9 1990 - ARRL	BX360	$21.60
Computer Networking Conf (Packet) 1-4 1982/5	BX166	$32.40
Gateway to Packet Radio 2nd edition - ARRL	BX169	$21.60
Packet Radio Made Easy - Rogers	MFJ32	$18.45
Packet Users Notebook - Rogers	BX285	$16.65
SATELLITE BOOKS		
Oscar Satellite Review - Ingram	MFJ31	$15.30
Satellite AMSAT-NA 5th Symposium 1987 - ARRL	BX182	$15.75
Satellite AMSAT-NA 6th Symposium - ARRL	BX199	$15.75
Satellite Anthology - ARRL	BX180	$14.40
Satellite Experimenters Handbook 1990 edition	BX177	$36.00
Weather Satellite Handbook - ARRL	BX324	$36.00
Weather Satellite Handbook Software only - ARRL	BX326	$18.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio - Orr	BX216	$15.57
Microwave Handbook Vol 1 - RSGB	BX318	$63.00
Microwave Update Con. 1987 - ARRL	8X174	$15.75
Microwave Update Con. 1988 - ARRL	BX183	$15.75
Microwave Update Con. 1989 - ARRL	BX321	$21.60
Mid Atlantic VHF Con. October 1987 - ARRL	BX175	$15.75
UHF Compendium Part 1 & 2 Vol 1	BX250	$44.96
UHF Compendium Part 3 & 4 Vol 2	BX251	$44.96
UHF Compendium Part 5 German Only	BX354	$44.96
UHF/Microwave Experimenters Manual - ARRL	BX325	$36.00
UHF/Microwave Experimenters Software 5 inch Disk - ARRL	BX327	$18.00
VHF 21st Central States Con. 1987 - ARRL	BX172	$15.75
VHF 22nd Central States Con. 1988 - ARRL	BX173	$15.75
VHF 23rd Central States Con. 1989 - ARRL	BX286	$15.75
VHF 24th Central States Con. 1990 - ARRL	BX322	$21.60
VHF/UHF Manual - RSGB	BX267	$43.20
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge - Diamond		$4.00
WIA Badge - Diamond with Call Sign Space		$4.00
WIA Badge - Traditional Blue		$4.00
WIA Badge Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Tape - Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book - 1991		$9.50
Band Plans Booklet		$2.80
WIA Log Book - Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all items above are available from all Divisions (and none are available from the Executive Office).
If the item is carried by your Divisional Bookshop, but is not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.

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IC-970A/H

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AMATEUR RADIO

JULY 1991 RRP $3.25

THE WIA RADIO AMATEUR'S JOURNAL

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Evan Jarman VK3ANI
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DRAFTING
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MARKETING
Bruce Kendall VK3WL
Norm Eyres VK3ZEP

ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161

Telephone: (03) 528 5962
(03) 523 8191
Fax: (03) 523 8191
(Non dedicated line)
Business hours: 9.30am to 3pm weekdays

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	Editorial	Hamads
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September	12/8/91	14/8/91
October	9/9/91	11/9/91

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Cover

Darcy Hancock VK5RJ celebrated his 80th birthday last December. Inset to photo of Darcy in his shack is the birthday cake baked for him in the shape of a transceiver, by his daughter in law Christina. See full story page 18.

Photographers: Shack XYL – Jean Hancock. Cake – Son Grant Hancock

EDITOR S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Joint Publication?

We have received three letters recently, two in "Over to You" and one directly to the General Manager, suggesting that this magazine, *Amateur Radio*, should amalgamate with a commercial magazine such as *Amateur Radio Action*.

In this editorial, I would like to point out that there is not only a great deal of historical precedent for such amalgamation, but that similar proposals do arise from time to time and are always given careful and detailed consideration by Executive. Such topics are never "swept under the carpet without ... frank discussion" to quote one correspondent.

It is claimed by supporters of amalgamation that there would be several benefits likely from it.

First, that it would reduce the cost to the Institute of providing a magazine to members.

Second, that it would increase circulation, by being available to non-members.

Third, the greater circulation would make it more attractive to advertisers, further reducing costs, and fourth, that the standard of material published would be raised.

The most recently received letter even claimed that *AR* "fails miserably", that "little in it appears to be done well", and it is "not ... attracting adequate advertising".

To reply to these claims: Yes, it might reduce the cost, but at what cost? Read a little further. Increased circulation, maybe; but the main privilege of membership would disappear. Advertising has increased considerably over the last year or so. Just compare for yourself.

As regards our quality of articles, why are we often reprinted by *Radio Communication*, *Communication Quarterly* etc? Our "Fails miserably" critic would help us by telling us in what way we fail. But he failed miserably to tell us!

Earlier this year we published an excellent series of articles by Colin McKinnon VK2DYM, entitled "The History of the WIA Journal".

It was shown that *AR* as a magazine owned and controlled by the WIA did not come into being until 1933, and from 1919 until 1933 the Institute, itself divided by various rivalries and breakaways, was represented by a number of commercial magazines.

None retained "official journal" standard for more than four years, and the companies and titles involved sometimes changed with bewildering rapidity. This was no doubt aggravated by the build-up to the Great Depression, not totally different from today's conditions, with even 150-year-old newspapers disappearing at short notice!

Since 1933, *AR* has continued to serve its purpose regularly and reliably. World War 2 reduced it to a duplicated newsletter, but it has never missed a printed issue since October 1945.

Editorial, printing and publishing arrangements have altered many times over that 46 years, but "as is" the WIA has total control over what is published, the cost per page (adjusted for inflation) has never been lower, and the lead-time has never been shorter. I write this on 12 June. You will read it in $2^{1}/_{2}$ weeks.

Let us all think long and carefully before we seek more (perhaps?) than we now have!

ar

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

Registered Executive Office of the WIA: 3/105 Hawthorn Road, Caulfield North, Vic, 3161

All mail to: **PO Box 300, Caulfield South, Vic, 3162** Telephone: (03) 528 5962 (03) 523 8191

Fax: (03) 523 8191 (Non-dedicated line)

Business Hours: 9.30 am to 3.00 pm on Weekdays

General Manager and Secretary: Bill Roper VK3ARZ

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Third Party Traffic Breakthrough!

For some years now negotiations between the WIA and DoTC on the topic of Third Party Traffic regulations have been bogged down by an inability to agree on a formal definition of "third party". The literal interpretation used by DoTC was at odds with that in use by most other countries which permit third party traffic by their licensed amateur radio operators (See WIANEWS item, May 1989). The WIA has long argued that the passing of a message from one amateur to another via a third amateur does not constitute third party traffic, preferring to reserve that term for use where the third person in the arrangement is a non amateur.

As announced as a "Stop Press" item in the June 1991 issue of Amateur Radio magazine, the WIA has at last received official approval and acceptance of our definition. A letter recently received from David Hunt, Manager Licensing, DoTC in Canberra includes the following:

In response to the WIA's submission, I am pleased to advise that the Department will no longer place a restrictive interpretation on the definition of Third Party Traffic by including licensed amateur within the definition. The Department accepts the responsible approach taken by the WIA in their representations on this subject and acknowledges the work of other Administrations in this area. Consequently, the Department agrees that a message originated by an amateur and passed to another amateur by a third amateur, whether within Australia or overseas, is not considered to be Third Party Traffic.

In other words, messages originated by one licensed amateur station and passed to other amateur stations by other amateur operators, will not be regarded as Third Party Traffic for the purposes of (International Radio Regulations) RR2733."

David then went on in his letter to explain that this change will be reflected in future brochures and licence conditions applying to the amateur service.

Victorian Division Office

There will be a minor change in the times the office is open for business.

The office is currently open from 9am to 4pm on Tuesday and Thursday.

As the major portion of the workload occurs before noon, the office will now open at 8.30am and close for business at 3.30pm.

Days of opening remain unchanged - Tuesday and Thursday.

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570 MHz 2m ch 6950 Rabroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramalta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2YEL VK2AOE	From VK2WI at 1045 and 1915 on Sunday, on the following frequencies: (MHz) 1.845 AM; 3.595 AM @ 1045 & SSB @ 1915; 10.125 SSB; 28.320 SSB & 1915; 10.125 SSB; 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; 1281.75 FM 7.146 AM @ 1045 only. 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW. News headlines by phone 02 552 5188.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Old 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK4ER VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 Wesl Perlh WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland - Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

This major breakthrough in Australian radio amateur regulations will be welcomed by all amateurs, but particularly those involved in packet radio communications.

Thanks are due by all Australian radio amateurs to David Hunt of DoTC for his help in resolving this long outstanding problem.

Amateur Morse Code Requirement

The question is often asked why do amateurs have to pass an examination in Morse code before they can operate on the bands below 30 MHz. Much comment has been seen in "letters to the editor" in the amateur press, and heard on-air, in recent times which indicates that many amateurs do not understand the situation.

Despite what many seem to think, it is not the WIA, or the DoTC, who insist that Morse Code be a requirement for the AOCP or the NAOCP. The answer is contained in the regulations that govern the amateur service.

There are two sets of regulations, one International and one National, that control the operation of the amateur service, including the conditions for qualifications for a transmitting licence. In fact, all telecommunications services, not just amateur, operate under similar conditions.

The international regulations are the Radio Regulations of the International Telecommunications Union (ITU). These Regulations are formulated by the member countries of the ITU, meeting as an Administrative Radio Conference. These Regulations are, in effect, a treaty between countries and have the same obligations.

The well known International Frequency Table is Article 8 of these Regulations, and Article 32 is the article setting out the international requirements of the Amateur Service and the Amateur Satellite Service. The applicable section of Article 32, RR2735 reads:

"Any person seeking a licence to operate the apparatus of an amateur station shall prove that he is able to send correctly by hand and to receive correctly by ear texts in Morse code signals. The administrations concerned may, however, waive this requirement in the case of stations making use exclusively of frequencies above 30 MHz."

These regulations can only be changed by an Administrative Radio Conference of the ITU.

An Administrative Radio Conference can only deal with matters which are on its agenda, which is set by the ITU usually some years before the actual conference. Any individual administration can propose items, but the item has to be approved by a majority of the member countries of the ITU before being included in the agenda. The Plenipotentiary Conference, which is held about every five years, may also have matters placed on the agenda.

WARC 79 had the whole of the ITU Radio Regulations on its agenda, and some small changes were made to Article 32 on the Amateur and Amateur Satellite Service.

Consideration of Article 32, however, is not on the agenda for WARC 92. The matters concerning the Amateur Service are all to do with the frequency table.

So much for the international regulations. National Regulations usually enlarge on the International Regulations, but should not conflict with them. Therefore, from this brief explanation, you can see that neither the WIA nor the DoTC is able to unilaterally ignore or modify the International Regulations relating to the Morse code requirement for Australian radio amateurs licensed to operate below 30 MHz.

Telecommunications and Saving Life

This year, World Telecommunication Day, celebrated internationally on May 17th, took as its theme "Telecommunications and the safety of human life". The United Nations General Assembly has also proclaimed the coming decade as Natural Disaster Prevention Decade.

In his message for the 1991 World Telecommunication Day, the ITU Secretary General, Pekka Tarjanne, emphasised the part that radio communications have played in increasing safety and saving lives since the first use of radio in the late 19th Century. From its initial development as an aid to mariners in distress, the safety net extended to land, air and now to space.

For effective disaster relief, telecommunications equipment may have to be moved rapidly across borders. The ITU is working with other bodies towards the possible development of an international convention to facilitate rapid movement and customs clearance for these situations.

Australian Radio Amateur Statistics

The DoTC statistics for the period to 31st March 1991 were received recently. According to these figures, the total number of individual licensed stations in Australia including beacons and repeaters is now 19,681, an increase of only 170 in the previous three months. Excluding beacons and repeaters, the number stands at 19,361.

However, with the help of new information from DoTC, a new procedure in the Executive Office now allows us to determine the total number of licensed operators as distinct from station licensees. This means that we can now quite accurately discount those operators who hold two or more station licences. This calculation indicates that there was a total of 17,566 licensed radio amateurs as at 31st March 1991.

It is of some concern to note that in the three months to 31st March 1991, the number of Novice licensees in Australia increased by only seven. Presumably a number of Novice operators up-graded, but where are all the new ones?

As an interesting comparison, a note in the ARRL newsletter for May 1991 lists the issue of new licences and upgrades in the USA for March 1991 as:

	New	Upgrade to
Novice	1,734	-
Technician	882	1,079
General	31	526
Advanced	5	371
Extra	4	240
Total	2,656	2,216

This indicates a much higher growth rate than in Australia, even allowing for the much larger population.

All Asian DX Contest

A note from the Japan Amateur Radio League, Inc., announces an alteration to the schedule of the All Asian DX Contest as follows:-

CW: The third Saturday of June (15th- 16th June 1991), from 00.00 (UTC) through 24.00 of the following day, instead of August.

Phone: The first Saturday of September (7th - 8th September), from 00.00 (UTC) through 24.00 of the following day, instead of the third Saturday of June.

Japanese Ham Fair '91

JARL News notes that the annual "Amateur Radio Festival" will be held this year on 23-25 August 1991. The program sounds as if a lot of effort has been made, with topics of interest to all groups as well as equipment displays and emphasis on youth participation. The same newsletter states that as a result of a membership drive for 5 weeks in November-December 1990, 1,104 new members were recruited to JARL.

Mariners Saved Despite Errors

We quote from the Newsletter of the Department of Transport and Communications:- *"From the Department's Quoin Ridge radio monitoring station in Tasmania comes the story of a boating party lucky to be alive. The boat owner had sent a distress signal using a two-*

way radio borrowed from another vessel. As a result, searchers initially looked for a 15 foot fibreglass half cabin cruiser when in fact the boat in distress was a 30 foot steel cruiser. To compound the situation, the radio was unlicensed, the distress signal was not transmitted properly and the boat owner did not hold an operating certificate. Despite these fundamental and potentially-tragic errors, the boating party was saved."

Special Achievement Award

The Dayton Hamvention 1991 Special Achievement Award was received by Nate Brighton, K6OSC, for his work over 12 years in restoring the original radio room on the "Queen Mary" now anchored at Long Beach, California. This restoration included the establishment of a complete amateur station which is now operational and open to the public.

Standards for Antennas

"The Australian Standard" for May 1991 notes release of a revision of the standards for "Receiving antennas for radio and television in the frequency range 30 MHz to 1 GHz". It specifies the electrical properties and performance parameters as well as methods of measuring these characteristics for antennas for domestic use.

1991 VK Novice Contest

A reminder that logs for the 1991 VK Novice contest should reach the Contest Manager by 26th July 1991. See your copy of June Amateur Radio magazine for the postal address.

Pay TV in Australia

The WIA recently received a promotional brochure for a rather up-market conference to be held in the Sheraton Wentworth hotel, Sydney. It is the third annual conference on Pay TV and it takes place over 18th and 19th June this year.

Whilst the WIA will not be directly represented, for the conference fee is over one thousand dollars, it is possible some amateurs associated with the TV industry may attend in their work capacity. If so, the WIA would appreciate a report on the conference.

The conference agenda is heavily slanted towards the industry and the impact pay TV will make upon it. Nevertheless a session is planned on legal, regulatory and licensing issues, although it is interesting to note the speakers do not include any Department of Transport and Communications officers. Indeed, they feature consultants and the director of the Communications Law Centre, an organisation not familiar to the WIA. In so commenting it must be observed the keynote speaker for the official opening address, name yet to be advised, will be putting the Federal Government's position. This will obviously be a paper worth getting.

What is of major concern to radio amateurs, where pay TV is involved, is the method of distribution of the services. We are all well aware of the EMC/RFI problems in the USA and elsewhere when cable TV is distributed at VHF carrier frequencies. Indeed, it has been difficult in the USA to have the amateur primary allocation at 144 MHz excluded from the cable channel allocations. We should take heart then, for this conference allocates time to consideration of the status of optical fibre technology and the presenter comes from Telecom, bringing an air of objectivity and strategic technology to the program.

The content of Pay TV is not a matter for WIA concern, however technical considerations which impinge upon our operating and enjoyment of the hobby are. Consequently, the WIA sees merit in Pay TV being distributed in digital format by optical fibre bearers. This digital approach has, we believe, considerable merit for the encryption of programs, the enhanced end to end signal quality and the ease of multiplexing a number of programs. Also the environmental impact of fibre optics cables is considerably less than bulky coaxial cables and only slightly more than MDS which would demand considerable SHF channels, some in an amateur secondary band!

IARU Region 3 Conference

The coming IARU Region 3 Association Conference is to be held in Bandung, Indonesia from 8th to 12th October this year.

The Conference agenda was published in WIANEWS in the April 1991 issue of Amateur Radio magazine. The Executive has now had time to consider in broad outline the WIA's likely involvement and provides the details for your information.

With a delegation of four representatives, funded from the WIA's international representation fund, the WIA will be able to be involved in working parties on bandplans, finance, packet radio, constitutional amendments and WARC 92. This is because these working parties usually meet concurrently.

The WIA can hold one proxy in our delegation. The WIA intends to advise its conference intentions as shown in this article to, and solicit a proxy from, one of the smaller Pacific amateur radio societies.

Executive will be asked in July to consider whether the WIA should submit an invitation to hold the 1994 IARU Region 3 Conference in Australia. The Gold Coast or an Eastern coast city are possibilities, but the WIA does not need to go firm on the location in the invitation.

On the matter of band plans the WIA will advise the current Australian amateur band plans. In particular the WIA is interested in how well the data segment on 20 metres is going. A letter has gone out to Divisions, technical committees and packet SYSOPS to seek these answers.

The Australian amateur involvement in WARC 92 planning will be advised. The immense value of David Wardlaw, VK3ADW's presence at the JIWP meeting in Geneva in March this year, as a member of the Australian delegation, will be highlighted.

The WIA will report changes in management of the radio spectrum in Australia such as the Bureau of Transport and Communications Economics report on valuing the spectrum, the joint Houses of Parliament inquiries into spectrum management and the release of the Australian Spectrum Plan in 1990.

The funding of IARU activities is an issue which has caused the WIA some concern in recent times as it became aware the Region 3 Association has run well over budget in this triennium.

The WIA is producing a short paper describing the Standards Australia and AUSTEL involvement in setting national standards. The RF Tag Devices debate the WIA had with DoTC last year will be used as an example of the need for international coordination of standards.

Our amateur satellite coordinator, Graham Ratcliff VK5AGR, will be contributing a paper on amateur satellite usage and funding satellite development. Wally Watkins VK4DO, has sent in a paper on the development of amateur radio in emerging nations, centred upon his experiences with visits to China as an amateur radio instructor. The WIA has also asked the Gladesville ARC if they can suggest means whereby other nations might utilise their instructional video tapes.

The WIA will advise the conference on recent changes relating to the allocation of callsigns to visiting amateurs. Whilst the situation is not exactly what prevails overseas, which was our desire, it is an acceptable compromise.

Intruder Watch comes in

for considerable debate at these international conferences. The WIA wishes to make the point, delicately, but as forcefully as possible, that many of the 10 metre intruders appear to be in countries to our north. The proliferation of 10 metre transceivers, not only there but also in this country, has not helped the problem. Indeed the WIA must soon reconsider the matter of *"no transmitter sales without an appropriate licence"*.

At the last Conference delegates were very strong on converting the 10 metre beacon system to occupy a much narrower beacon band segment and be time sharing like the 20 metre system. Since then the need to occupy amateur bands has taken on more significance and a compromise solution may be the way ahead. No Australian beacons have changed, ostensibly because of the difficulty in constructing an accurate clock sequencer to control them. Resorting to the past system and band plan may not be the best option, for the beacon segment is in the Australian novice segment; nevertheless some compromise should be possible which continues to populate part of the band and stake the amateurs' claim in the face of CB, pirate and commercial pressures.

Amateur radio direction finding is an expanding facet of amateur radio in emerging countries. It is like foxhunting on foot combined with orienteering. Australia is not strong on this activity, however Wally Watkins and the Townsville ARC are involved in such a contest in China next August.

Our unique and constraining third party traffic definition, which was of interest, and concern, to regional amateurs at the last conference, is no more. Recent negotiations with DoTC have put in place conditions identical to those prevailing in England, USA and New Zealand. Of course bi-lateral agreements are still required for general (ie non-amateur) traffic handling with overseas countries.

The WIA intends to inform the Conference of its recent decisions on the handling of QSL cards. That is, an essentially free service for members and handling on a cost recovery basis for non members. The WIA will strongly emphasise that it accepts inwards cards in keeping with IARU rules.

Packet radio is a topic which creates considerable interest at conferences like this one. The WIA is working towards a SYSOPS "Code of Ethics" or guidelines and hopes to present a first agreed version to the Conference. The WIA observes that other national societies are formulating such guidelines, being aware of an RSGB example and a recent JARL production. In all cases the aim is to guide and advise, rather than regulate, to protect packeteers from the strong arm of national authorities. Packet frequencies and third party traffic considerations are considered elsewhere on the agenda.

The WIA has been very concerned of late with the apparently poor budget management of the Region 3 Association leading to financial difficulties and a call upon regional societies for supplementary funding by way of donations. The WIA responded in 1990 with a donation of $US1000. It is the WIA's intention to ensure a reasonable and sensible budget is struck and adhered to. The formula for determining subscriptions needs alteration to balance the larger societies contributions, at the same time noting JARL contributes in kind which is not brought to account and ORARI would find it difficult to accept overly large increases.

There are constitutional changes the WIA would wish to see made to the Association's articles. The WIA believes the Association is now mature and needs its office bearers regularised by the creation of a President to replace the current chairman of directors arrangement. There is also a need to designate an official as treasurer, as the sorry financial situation has demonstrated the difficulties where the secretary has double duties. There may also be merit in setting limits to the duration directors and other officers hold office without a break period. The WIA believes three trienniums are enough, with perhaps the ability for the conference in plenary to extend a further triennium by special resolution. The WIA wishes to retain the good workers, yet achieve a turnover without offence to any one.

The Regulations of the Association are in need of revision as to the method of conduct of conferences. With meetings only once every three years, and at some expense to all involved, it is essential maximum benefit be obtained on all fronts. The WIA believes a Conference chaired by the Chairman of Directors (or, as the WIA intends to propose, the President) with his Association secretary in support, is the most business-like way of progressing the Conference.

Not withstanding the business paper, the Conference has great local prestige value in addition to its social contact value. To host the Conference is a way of applying subtle pressure upon a national administration and maximum mileage must be made of this facet. By appointing the host societies' president as the Conference President this objective can be exploited to the full without detracting from the Conference business. Furthermore, the workload is aptly shared by two appropriate amateurs of suitable stature.

The election of office bearers brings the WIA to the point of *"putting its money where its mouth is"*. The chairman of directors, David Rankin 9V1RH/VK3QV, is a very capable director, however he has held office for several trienniums and is deserving of a break. A compromise is to reelect him for one more triennium as President on the clear understanding the position must rotate in 1994. The Australian resident Director, David Wardlaw VK3ADW, has completed one triennium and will be re-nominated by the WIA.

The WIA has given consideration to nominating an Australian for the secretary position. However, the current financial state of the Association, the contributions in kind by JARL (which would be very difficult to realise in hard currency) and the financial burden the office would make upon the WIA all suggest the WIA defers that action.

VNG Update

The latest VNG news received from Marion Leiba VK1VNG/VK1BNG, reads:

"On 28 May 1991, Australia's standard frequency and time signal service, VNG, was issued a licence to operate on 8.638 MHZ. Like 12.984 MHz, 8.638 MHz is on loan from the Royal Australian Navy and we are again very grateful. It must be remembered, however, that the Navy reserves the right to take back these frequencies at any time should they need them.

These new transmissions will both be double sideband at 10 kW power, but with the bandwidth restricted to 3 kHz at the Navy's request. Also, because of the international spectrum allocations, VNG is not permitted to transmit voice on either frequency. Instead, the letters 'VNG' will be transmitted in slow Morse, possibly three times a minute with a frequency of 750 Hz. For those who don't know Morse, VNG is '...- -. --.'

The frequency synthesisers for 8.638 and 12.984 MHz are being built in the Geology Department of the University of Tasmania, located in Hobart, by Vagn Jensen. Vagn also designed the synthesisers and construction is almost complete.

The staff at the VNG site at Llandilo are going to shuffle aerials and transmitters. The present VNG standby transmitter will be used for 16 MHz with yet-to-be-constructed

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Modulation Systems & Modes of *Transmission*

A Discussion on Their Merits

Lloyd Butler VK5BR 18 Ottawa Ave, Panorama 5041

Introduction

OVER THE YEARS, we have phased out straight amplitude modulation on the HF bands and replaced it with single sideband. On VHF we give preference to frequency modulation. What are the merits of these various systems and why do we choose one in preference to the other? We might expect the answers to these questions to be well understood by the seasoned amateur radio operator, but perhaps not so well understood by our less experienced or novice operator. This article is essentially written for the latter, but a little bit of revision concerning some of the principles might not go astray for all of us.

In the paragraphs which follow we discuss the fundamental differences between the various modulation forms and compare them with reference to such characteristics as bandwidth, noise immunity and transmitter efficiency. Initial discussion involves the various forms of modulation in relation to speech transmission, and this is followed by their application in encoded modes of transmission such as hand-sent Morse, machine telegraphy and other digital systems. A brief reference is also made to their application in television.

Amplitude Modulation

In amplitude modulation (AM) the amplitude of the radio frequency (RF) carrier wave is varied as a function of the instantaneous voltage of the modulating signal. When the modulating signal goes positive, the carrier wave amplitude is increased. When the modulating signal goes negative, the carrier wave amplitude is decreased. The degree of modulation is expressed as a percentage of maximum modulation possible without distortion of the signal information. Figure 1 shows the carrier wave modulated 100 per cent by a sine wave modulation signal. The carrier wave amplitude is doubled by the most positive going excursion of the modulating signal and the amplitude is reduced to zero by the most negative going excursion of the modulating signal.

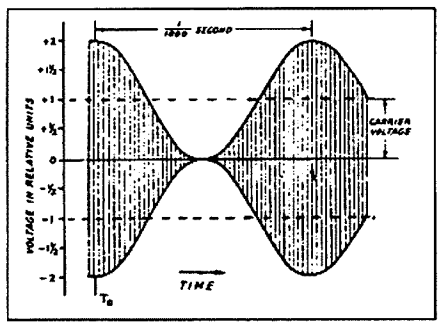

Fig 1. Envelope of carrier 100% modulated by a 1000 Hz sine wave.

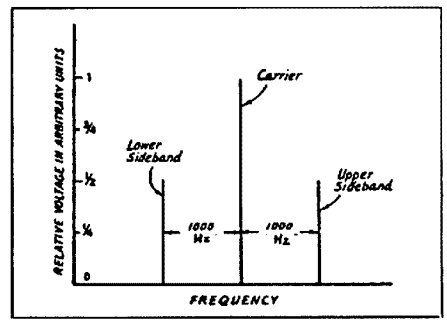

Fig 2 – Example of 100% modulation of a carrier by a single tone of 1000 Hz.

The waveform shown in figure 1 is a plot of carrier amplitude on the Y axis as a function of time on the X axis, and this is often defined as being plotted in the time domain. If we plot the amplitude on the Y axis as a function of frequency on the X axis, often defined as being in the frequency domain, we get a different picture. Figure 2 shows, in the frequency domain, a 1MHz carrier frequency modulated 100 per cent by a 1000Hz sine wave modulating signal. The carrier frequency at the centre is the same amplitude as if it were unmodulated. However, there are two side frequencies created, one equal in frequency to the carrier frequency plus the modulating frequency, and one equal in frequency to the carrier frequency minus the modulating frequency. The amplitude of each of the two side frequencies is half that of the carrier frequency.

Since power is proportional to the square of voltage, the proportion of power in each side frequency is equal to 0.5

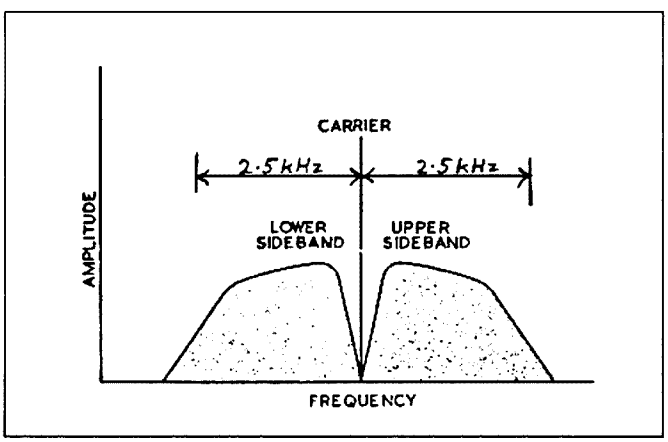

Fig 3 — Amplitude/frequency relationships of carrier and sidebands with 100% speech modulation.

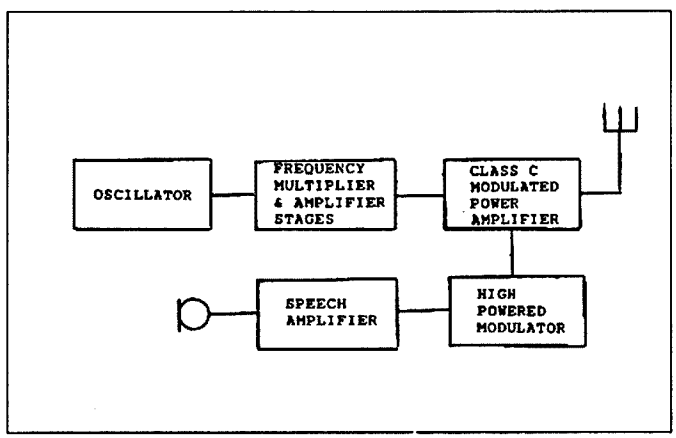

Fig 4 — High level (plate modulated) amplitude modulation transmitter.

squared or a quarter of that in the carrier. If the carrier is modulated 100 per cent by a complex waveform of many frequencies, two sidebands of frequencies are created, each with power equal to a quarter of the carrier power. The significance of all this is shown by considering a carrier of 100 watts modulated 100 per cent. Additional power of 25 watts in each sideband is also transmitted, making a total power of 150 watts. The intelligence transmitted in the complete modulated signal is contained in the sidebands and only one of these is needed to support this intelligence. Here we see a reason why single sideband (SSB) transmission is used in preference to transmitting the basic AM; 25 watts of SSB is just as effective as 150 watts of AM carrier plus sidebands.

A further consideration is the bandwidth taken up by the amplitude modulated signal. To transmit good quality speech, audio frequencies in the range of around 200Hz to 2500Hz must modulate the carrier. Hence the sidebands extend from 2500Hz below the carrier frequency to 2500Hz above, requiring a complete bandwidth of 5000Hz (refer figure 3). If one sideband and the carrier are suppressed, as in the SSB system, bandwidth is reduced to 2300Hz, less than half that of the AM signal. This means that the receiver bandwidth can be halved and more signals can be fitted in a given bandspace to be received without interference. Suppression of continuous transmitted carrier on adjacent signals also results in improved reception as heterodyne whistles are eliminated. These whistles are often a problem on a crowded band of AM signals.

The AM Transmitter

In replacing the AM system with the SSB system, some significant savings are achieved in the size of the RF power amplifier and in the power supply which feeds the amplifier. Let us consider an AM transmitter which is to deliver 100 watts of carrier power. High level or plate modulation (as shown in figure 4) is to be used, and, in this system, our final RF power amplifier can run at the highest possible efficiency in Class C operation. In this form of operation, the output tuned circuit (called a tank circuit) is pumped to maintain it in oscillation by pulses from the RF power amplifier. The amplifier is biased to allow only a small portion of the RF drive sine waveform to be amplified, so providing the pumping pulse. In this form of operation (Class C), the amplifier can be made to operate much more efficiently than as a linear amplifier which must reproduce the complete sine wave fed into it. Efficiencies in the order of 70 to 80 per cent can be expected from a Class C amplifier, and for our transmitter we will assume a value of 75 per cent. Our total input power to the transmitter is therefore 133 watts of which 100 watts is radiated and 33 watts is dissipated in the amplifier in heat. To supply the amplifier, we need a power supply which can deliver a power of 133 watts and we need an amplifier valve (or perhaps a transistor) which can dissipate a continuous power of 33 watts.

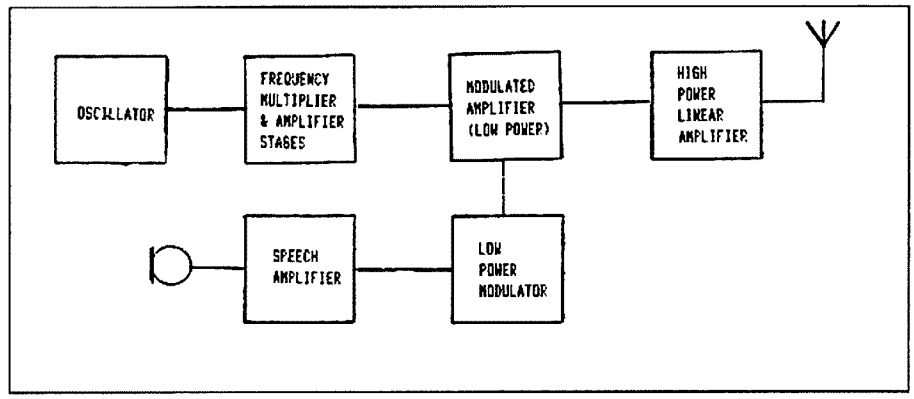

Fig 5 — Low level amplitude modulation transmitter.

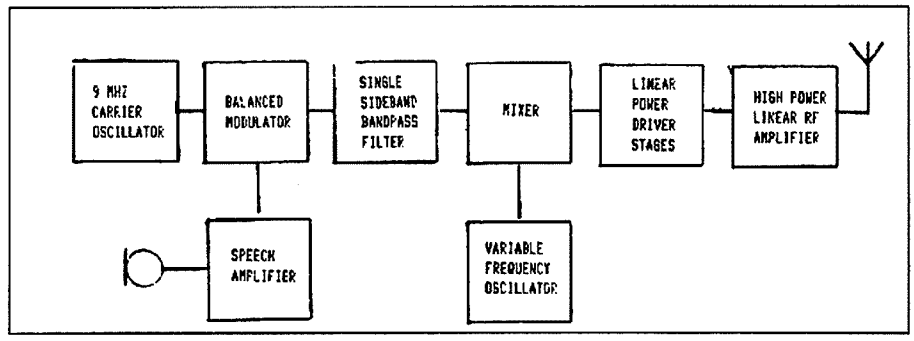

Fig 6 — Typical single sideband transmitter.

To 100 per cent modulate our transmitter, we also require 50 per cent of extra power for the sidebands, and this is 50 per cent of the input power 133 watts, not the 100 watts of output power. The extra power is supplied as 67 watts of audio from the modulator output stage. The modulator stage runs as a high efficiency power amplifier in Class AB or Class B and a practical efficiency might be as high as 60 per cent which we will assume. At 100 per cent modulation continuous tone, DC load on the modulator power supply is 112 watts and the modulator valves or transistors must dissipate 45 watts. The output power on speech is only about 20 per cent of the peak power which gives 100 per cent modulation. However, the average DC power is somewhat higher than this because of the zero signal standing current into the amplifier. In Class AB, the power input at zero signal might be in the order of one quarter to one third of the input power at peak output, and for our case, around 28 to 37 watts. All in all, the modulator amplifier must dissipate an average power of around 30 to 40 watts, and the modulator power supply must be able to supply a varying load which swings between say 30 to 112 watts.

To summarise this, our 100W AM transmitter requires the following:

RF power amplifier — 33 watts continuous dissipation

Modulators — Average dissipation 30 to 40 watts

RF amp power supply — 133 watts continuous

Modulator power supply — Swinging load 30 to 112 watts

As an alternative, we could use low-level modulation to eliminate the high power modulator and its power supply. Either grid modulation is used or a RF driver stage is modulated and followed up with a linear RF final power amplifier as shown in figure 5. In either case, the final amplifier, being a linear stage, must be operated at a much lower efficiency than in class C. Hence, higher dissipation amplifiers are needed and a larger power supply. What is gained in reduced modulator power is lost in extra dissipation power in the final RF amplifier.

The SSB Transmitter

A typical single sideband transmitter is shown in figure 6. The SSB signal is generated in the low-level stages of the transmitter. A balanced modulator is used to balance out the fixed carrier of 9MHz, leaving a double sideband suppressed carrier signal. This is fed through a fixed frequency narrow band filter designed to slice off one of the two sidebands. The remaining sideband is mixed with a variable frequency oscillator (VFO) to produce the SSB signal at the required operational frequency. All stages following the modulator (including the final RF power amplifier) must be operated in a linear mode. Since the final amplifier is linear, it cannot be operated in Class C, and its power efficiency is lower than that obtainable in a high level modulated AM transmitter. Before considering this to be a disadvantage, we must first examine actual powers involved.

It was pointed out earlier that 25 watts of single sideband was equally effective as a 100W carrier AM signal fully modulated. To make comparison with our AM transmitter, we use 25 watts of SSB. Our final linear RF amplifier in, say Class AB, might be expected to have a typical efficiency of 50 per cent. At this percentage, input power is 50 watts and hence our power supply must deliver 50 watts and our amplifier must dissipate 25 watts. This is a large improvement on the 133 watts of input power and 33 watts of dissipation quoted for our AM transmitter, but our gain is even better than this. The 50 watts input to the SSB amplifier on speech is our peak envelope power (PEP). As we discussed earlier, the average power into a Class AB amplifier on speech is much less than this and possibly in the region of 30 per cent of the peak value. Taking this percentage, the average input power is only 15 watts, with the average dissipation perhaps half of the 15 watts. (The average dissipation will depend much on what standing current is run in the no-signal condition between speech syllables).

Now to summarise the SSB transmitter:

RF power amplifier — 7.5 watts average dissipation

RF amp power supply — Average power load 15 watts with regulation to allow for short duration peaks of 50 watts.

High power modulator not required.

Comparing this to the AM transmitter, previously described, we see that SSB offers a considerable reduction in the ratings and size of components used in the final stages of the transmitter. Even though the SSB circuitry is a little more complicated, the SSB transmitter can be made more compact than the AM unit of equal effective power.

Frequency Modulation

In frequency modulation (FM), the frequency of the carrier wave is varied as a function of the instantaneous voltage of the modulating signal. This is illustrated in figure 7. The amount of frequency shift off the centre frequency is called the frequency deviation. A peak deviation of 5kHz (such as used in amateur radio systems) means that the carrier frequency is shifted in one direction a maximum of 5kHz by the positive going peaks of the modulating signal and shifted in the opposite direction a maximum of 5kHz by the negative going peaks of the modulating signal. Total frequency swing is thus 10kHz.

Modulation index is defined as the ratio of frequency deviation to modulating frequency producing the deviation. If a 1kHz modulating signal produces 5kHz of deviation, the modulation index is equal to 5. Considering a maximum speech frequency of 2.5kHz, the modulation index equals 2 if the carrier frequency is driven to a maximum deviation of 5kHz by that particular speech frequency component.

The FM receiver is designed to be insensitive to amplitude variation in the RF signal it receives. As random incoming noise is received essentially as a voltage of fluctuating amplitude, the receiver on FM has a signal to noise ratio advantage over an AM receiver, given received signals of equal carrier amplitude. The degree of that advantage is dependent on the modulation index which is used and this is illustrated in figure 8 showing noise reduction factor in dB as a function of the index. The diagram shows that to gain advantage, the modulation index must be greater than 0.6, and the higher the value of the index, the greater is the noise reduction factor. In comparing the FM and AM systems, equal receiver audio bandwidth is assumed.

All this is fine except that the FM signal has sidebands much more complicated than the AM signal, and which theoretically extend infinitely either side of the carrier frequency. In practice, we need only to consider the sideband frequencies which are of significant level. The bandwidth of the significant sidebands increases both as the modulation index is increased and as the modulating frequency is increased. The second curve in figure 8 plots the bandwidth of the significant sidebands as a function of modulation index for a modulating frequency of 2.5kHz, chosen as the maximum speech frequency. Using both curves, we see that to get a 10dB signal to noise ratio advantage we need a modulation index equal to 2. However, to achieve this, we take up a bandwidth of around 22kHz.

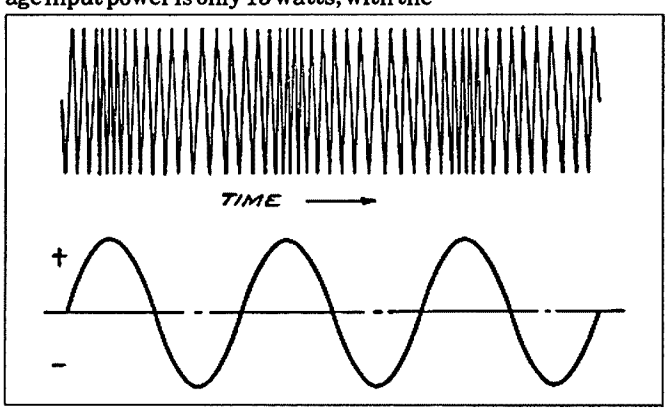

Fig 7 — A frequency-modulated signal in which the frequency of the signal varies in accordance with the level of the modulating audio voltage. At points where the audio voltage is positive, the frequency is high, while at points where the audio voltage is negative, the frequency is low.

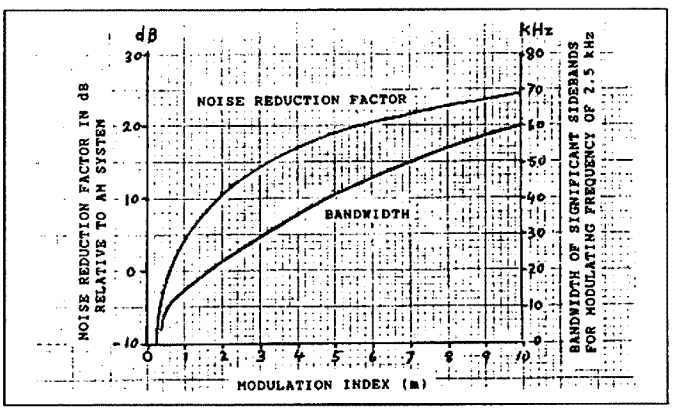

Fig 8 — Comparison of bandwidth and noise reduction factor in FM system for different values of modulation index at a modulating frequency of 2.5kHz.

So here is the answer to why FM is restricted essentially to the VHF and UHF bands. FM gives us a signal to noise ratio advantage over AM, but it takes up more bandwidth and much more than we are able to accommodate in the restricted bandspace of our HF bands. More bandspace is available on the VHF and UHF bands, allowing us to use FM as a popular mode of transmission. On two metres, for example, we use 25kHz channel spacing to accommodate the wide bandwidth FM signals.

Frequency modulation is actually allowed on the HF bands, but bandwidth is restricted to 6kHz, limiting the modulation index to around 0.4 at 2.5kHz modulating frequency. With this restriction, performance cannot be expected to be any better than AM, and not as good as SSB.

The FM Transmitter

As in the SSB transmitter, modulation of the FM signal is carried out in the low level stages of the transmitter (refer figure 9). However, unlike the SSB transmitter, linear amplification is not required following modulation and the following stages (including the final amplifier) can be run at highest efficiency in Class C operation. The final amplifier efficiency is thus similar to that of an AM transmitter using high level modulation. Of course, a high power modulator is not required as in the AM transmitter so that the high power circuits in the FM transmitter are less complicated than for the AM transmitter of similar carrier power.

Squelch

Mobile radio systems essentially use the VHF and UHF spectrums where bandspace is less of a premium than in the HF spectrum and where the VHF and UHF frequencies are more suited to the short range communication required. Most of the mobile radio networks now use FM to gain the signal to noise ratio advantage over AM (which was used in earlier systems). SSB has not generally been used and we offer one very good reason for this. A desirable requirement in a mobile vehicle is to maintain the radio silent when no signal is being received. To do this, a "squelch" circuit is used which turns on the receiver audio stages only when a carrier is being received. Of course, a SSB signal has no carrier and the sidebands are only sent on speech syllables. Operation of squelch on these could be erratic, particularly in the presence of noise. So the point is made that SSB is at a disadvantage for systems, such as mobile radio, where a simple squelch system is desired.

CW

Of all the modes of transmission used in amateur radio, what we call continuous wave (CW) transmission is the simplest to generate. The RF continuous wave is simply turned on and off by some manual or automatic keying device to transmit an intelligible code. If we examine the transmitted waveforms with a spectrum analyser, in what we have previously referred to as the frequency domain, we see that the signal is another example of amplitude modulation. The display shows a carrier frequency with sidebands formed from the modulating signal which is a modified square (or rectangular) waveform with its fundamental frequency (or frequencies) set by the keying speed.

Of course, the squared keying waveform must be band limited as a perfect square wave has infinite odd harmonics which would produce sidebands of infinite width. Excessive sidebands are heard as key clicks at frequencies extended either side of the operating frequency. To prevent this, the keying circuit is fed through a low pass filter to limit the harmonics and hence the bandwidth radiated. For satisfactory aural reception of Morse code, references recommend that at least the third harmonic should be transmitted for non-fading conditions and both third and fifth harmonics for fading conditions.

The rate per second at which the keying signal changes its state, either space to mark or mark to space, is called the baud rate. For Morse code, the baud rate has been quoted as approximately equal to the Morse speed in words per minute (WPM) divided by 1.2. For 20wpm speed, the baud rate is thus 16.7 and the fundamental frequency is half that, or 8.3Hz.

Assuming we radiate up to the fifth harmonic of the keying frequency, each sideband is $5 \times 8.3 = 41.7$Hz wide, and the total bandwidth is twice this, or 83.4Hz. Because of the narrow bandwidth, many more Morse code CW signals can be fitted in a given bandspace than any form of voice modulation. To take full advantage of this fact, a good receiver for CW should have a crystal filter, or some other means, to restrict its bandwidth to hundreds of Hertz.

The CW transmitter is the simplest of all. The RF circuits can all run at maximum efficiency in Class C, and no high power transistor or valve modulator is required, as the modulator is the simple keying circuit. The final amplifier stage in a CW transmitter can usually be run at higher power than the high level modulated final amplifier in an AM speech transmitter. In the latter, instantaneous voltage applied to the modulated amplifier is doubled at peaks of modulation and the stage must be rated to withstand this. Furthermore, the power dissipation is continuous whereas, in the CW transmitter, average power is reduced by the on/off keying operation.

Frequency Shift Keying

In automatic radio telegraphy and digital data transmission systems, we normally use frequency shift keying, as this is another form of frequency modulation which gives improved signal to noise ratio. Radio teletype (RTTY) as used in

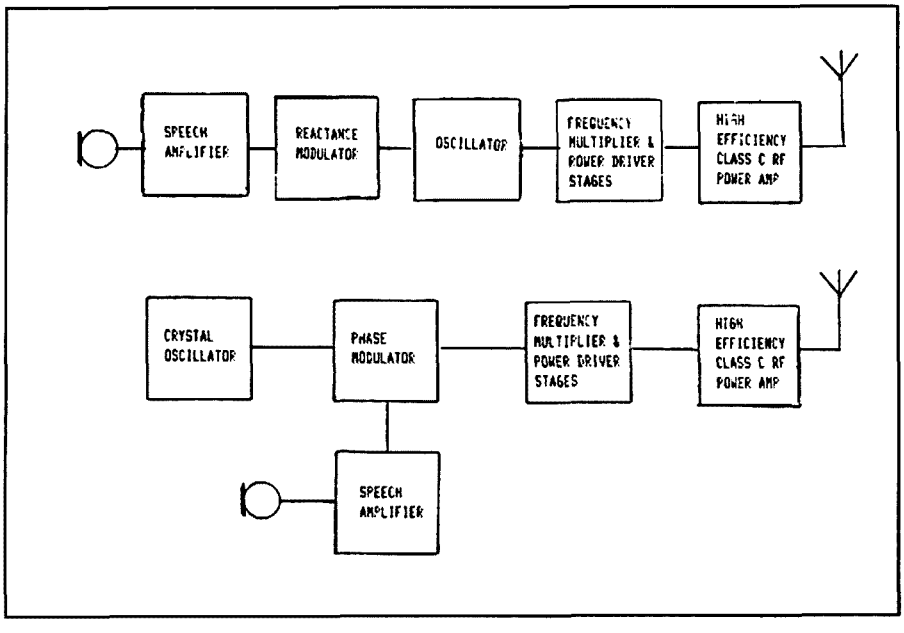

Fig 9 — Typical frequency modulation transmitters.

amateur radio generally runs at a baud rate of 45.45 (and sometimes 50) with a frequency shift of 170Hz. The fundamental modulating frequency is thus 45.45/2 = 22.73Hz and the frequency deviation is 170/2 = 85.5Hz. The modulation index at the fundamental frequency is therefore 85.5/22.73 = 3.76 which, from figure 6, gives a signal to noise ratio improvement of 16dB over AM or amplitude keying.

From references, the minimum bandwidth for the teletype is given as being equal to baud rate plus frequency shift multiplied by 1.2. Using this, minimum bandwidth = 45.45 + 170 x 1.2 = 249.45 (let's say 250).

In amateur radio teletype we use audio frequency shift keying (AFSK) and use standard frequencies of 2125Hz for mark and 2295 for space or 1275Hz for mark and 1445 for space. By feeding these tones into the audio input circuit of our SSB transmitter, the RF single sideband generated appears as if we were simply shifting a carrier at 170Hz of shift.

Using FM equipment at VHF, the tones are again fed to the audio input, but in this case we have a frequency modulated audio sub-carrier in turn frequency modulating the RF carrier. In this case, derivation of the significant bandwidth is a little more complicated. The audio bandwidth is calculated as before as equal to 250Hz. The highest frequency in the audio tones is then determined and, for the 2125/2295Hz tones, this is worked out by taking the average of these frequencies and adding it to half the audio bandwidth. The result is 2334.5Hz. The radiated FM bandwidth is now worked out by adding the highest audio frequency result to the frequency deviation used and multiplying by 2. For 5kHz deviation, the significant bandwidth works out to 14.669kHz.

Using frequency shift of the carrier, as is achieved by feeding the audio tones into the SSB transmitter, the RTTY transmission is a narrow-band mode similar in bandwidth to Morse with CW transmission. Feeding the tones into an FM transmitter (or, for that matter, a double sideband with carrier AM transmitter), the RTTY is a wide-band mode similar to speech.

Packet radio systems operate at much higher baud rates than RTTY, and baud rates vary from 300 — often used on the HF bands — to 9600 for meteor-scatter and satellite communications where access time is limited. A 300-baud system using an RF carrier shift of 200Hz has a modulation index of 0.67 and requires a bandwidth of 540Hz. Higher baud rates

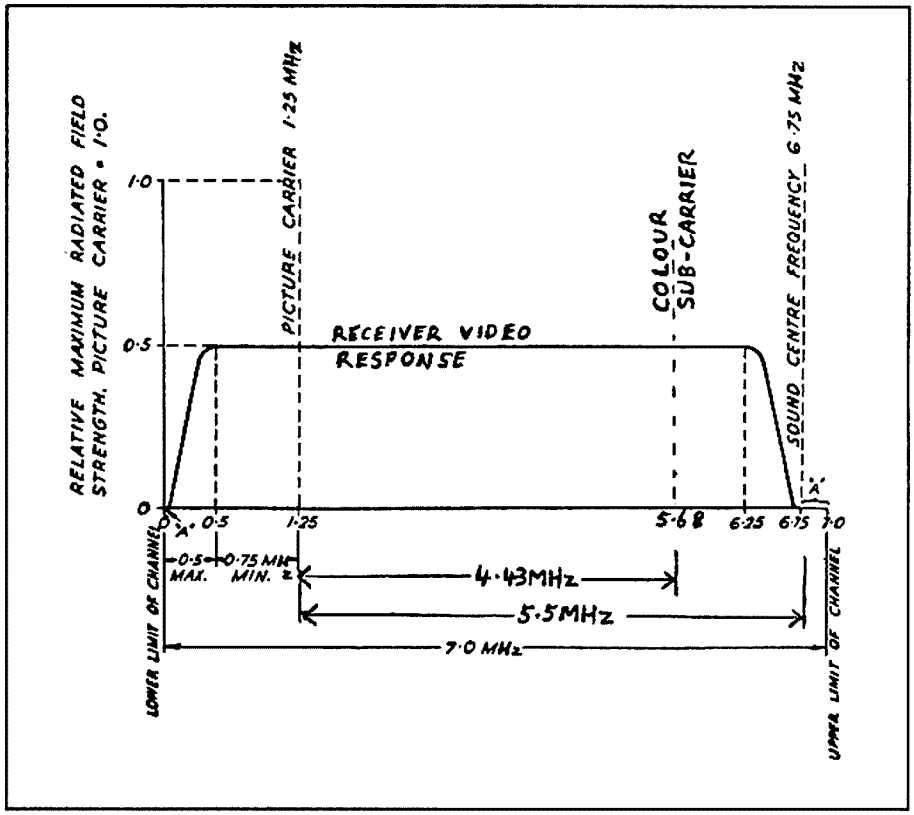

Fig 10 — PAL television signal format.

(typically 1200 on the VHF band) call for bandwidths comparable with speech or greater.

Television

To reproduce, with high definition, the picture elements in a PAL system TV picture, video components approaching 5MHz must modulate an RF carrier. Together with the sound, which also modulates a carrier, a total bandwidth of around 7MHz is needed. In a standard PAL system, the video signal amplitude modulates the vision carrier, and one complete sideband is fully transmitted. For the other sideband, bandspace is reduced by transmitting the low frequency modulation components of the sideband up to around 1.25MHz. The system is called vestigial sideband transmission. Whilst only one complete sideband is needed to convey the signal information, there is a problem in making a sideband filter without phase shift around its cut-off frequency. Reproduction of the TV picture is seriously affected by phase shift in the low frequency components and, hence, the sideband cut-off is shifted up to well above the frequencies which are most affected.

To take advantage of the improved signal to noise ratio of FM and the high quality sound reproduction which can be achieved, frequency modulation is used in the TV broadcasting system. The system also minimises interference from the amplitude modulated video signals. The sound carrier is spaced exactly 5.5MHz from the vision carrier and, in the TV receiver, the two carriers beat together to form the 5.5MHz sound IF channel.

The standard PAL signal format is shown in figure 10. This shows the vestigial sideband arrangement and the difference frequency of 5.5MHz between the vision and sound carriers. For colour TV, an additional 4.43MHz colour sub-carrier is superimposed on the video signal and this appears as a single sideband component 4.43MHz above the vision carrier. As seen by the diagram, the system takes up a bandwidth of 7MHz, some hundreds of times the bandwidth used by even our widest speech modes. Hence, amateur TV is confined to the UHF bands where more bandspace is available. Amateur TV may also operate as a double sideband system and, as seen in figure 11, it takes up a bandspace of over 11MHz. Fast-scan TV (as we call the system described) is clearly not suitable for the lower frequency bands. However, there is a group of enthusiasts who transmit slow-scan TV which requires a more modest bandspace.

In the PAL TV system, the complete picture or frame is scanned 25 times per

second, and each frame is made up of 625 lines (including those which are not seen during the scan retrace). In slow-scan TV, the scanning rate is slowed down to one frame in a number of seconds, and the number of lines in a frame is reduced. Images appear as a series of still pictures which change with the movement of the televised object rather than as a continuous moving picture. Bandwidth is reduced both by the reduction in scanning speed and by transmitting picture elements of lower definition. Using slow-scan TV, signal bandwidths comparable with speech can be achieved, and hence it is feasible to transmit on the HF bands.

Summary

Various forms of modulation and how they are applied to the modes of transmission have been discussed. In amplitude modulation, there is much to be gained in suppressing one of the sidebands and the carrier signal. Hence single sideband transmission has been phased in over the years in preference to the basic AM system. Advantages are a reduction in bandspace, elimination of heterodyne whistles heard on the band and more effective use of RF power generated in the transmitter. For a given effective signal, a lower power rating in the RF amplifier and a smaller power supply are achieved.

Frequency modulation has a signal to noise ratio advantage over amplitude modulation, but to gain the advantage, the modulation index must be greater than 0.6 with a resultant bandwidth on speech considerably greater than that required for amplitude modulation. Because of this, FM is essentially used on the VHF/UHF bands where the wider bandwidth can be better accommodated.

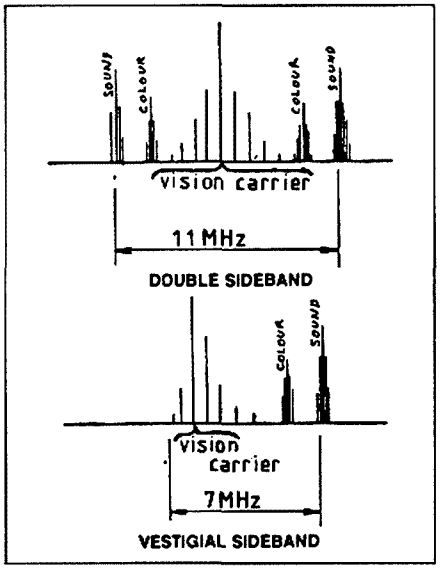

Fig 11 — Comparison of double sideband and vestigial sideband TV signal formats

CW transmission, as we know it, is a form of amplitude modulation, and bandwidth must be allowed for the sidebands generated from the keying characters. At hand-keying speeds, quite low fundamental frequency components are generated. Hence CW signals occupy a narrow bandspace provided the keying signal is adequately filtered to remove higher order harmonics.

Frequency shift keying, as used in RTTY and digital data systems such as packet radio, is a form of frequency modulation in which significant FM sidebands are generated. The bandwidth of these sidebands is determined by the baud rate (or modulating frequency component) and the amount of frequency shift (or frequency deviation).

Fast-scan television has such a wide bandwidth that amateur experimentation is restricted to the UHF bands. Slow-scan television, as used in amateur radio, has a bandwidth comparable with speech and can be used on the HF bands.

For further reading, some excellent material on modulation and data transmission systems can be found in the latest issues of the *ARRL Handbook*. References to this and other sources of information are included following.

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Propagation of Long Radio Waves

JOHN ADCOCK VK3ACA
12 ALBERT STREET, OAK PARK 3046

(CONTINUED FROM JUNE ISSUE)

PART 2. HIGH FREQUENCY PROPAGATION IN BRIEF...

IN THIS SECTION IT IS PROPOSED to point out some main, and some possibly less known, features of high-frequency propagation, and then show how this differs from low-frequency propagation. Many characteristics of high frequency propagation are well known, and will be only referred to here.

Surface Wave Propagation

At high frequencies, the processes resulting in surface wave propagation are usually of little importance. Quite often sky wave signals and general band noise are sufficient to drown out surface waves beyond a few kilometres. Also, antennas on HF are not usually designed to optimise surface wave conditions.

Ionospheric Reflection at HF

Propagation of high-frequency waves much beyond the horizon and to great distances, depends upon reflection between the earth and the ionosphere. The process of reflection is caused by a decreasing "effective" refractive index of the ionised media with height. Reflection takes place when the wave reaches a point where the refractive index is sufficient to cause total internal reflection. In other words, the wave is refracted to a point where it is turned and returned to earth, see figure 3. (Note that in all propagation diagrams for clarity the height scale is four times that of the distance).

The ionosphere starts at roughly 70km above the earth's surface in the day an 90km at night, and increases in intensity and height to about 300 and 400km. Above this, ionisation decreases with height and is, therefore, of no consequence. The ionosphere is layered. The existence of the D, E and F layers is well known. The layers are diffuse with ionisation in between. In fact, it is probably rare to have a decrease in ionisation between the layers.

As far as high frequencies are concerned, most significant reflection takes place in the F layer, with some reflection taking place in the E layer during the day. On HF, and particularly for DX, E layer reflection is more of a nuisance than an advantage. For more information the reader is referred to the many articles on the subject of HF ionospheric propagation, some of which have been published quite recently. A very useful article, "Why is there a Maximum MUF" (Ref 1) appeared several years ago, and presents a very good basic view of HF ionospheric propagation.

Air has a refractive index slightly higher than 1, the refractive index of a vacuum equals 1. If normal physical variations were to take place in air, only very small differences in refractive index can exist and, therefore, reflection can take place only at a low angle to any layer of discontinuity in refractive index. The ionosphere can reflect at a high angle to the plane of reflection and even at right angles to the plane. Since a medium cannot normally have a refractive index less than 1, it is, therefore, obvious that the behaviour of the ionosphere is quite different from that of a normal medium.

From formula 2, if $n_1=1$ (approx for air) and i is a small angle, then total internal reflection can take place only if n_2 is less than 1. See formula 3:

$$\sin r = \frac{\sin i}{n_2} \qquad (3)$$

also, if i approaches 0^0, that is, reflection at right angles to the plane, then n_2 must approach 0^0.

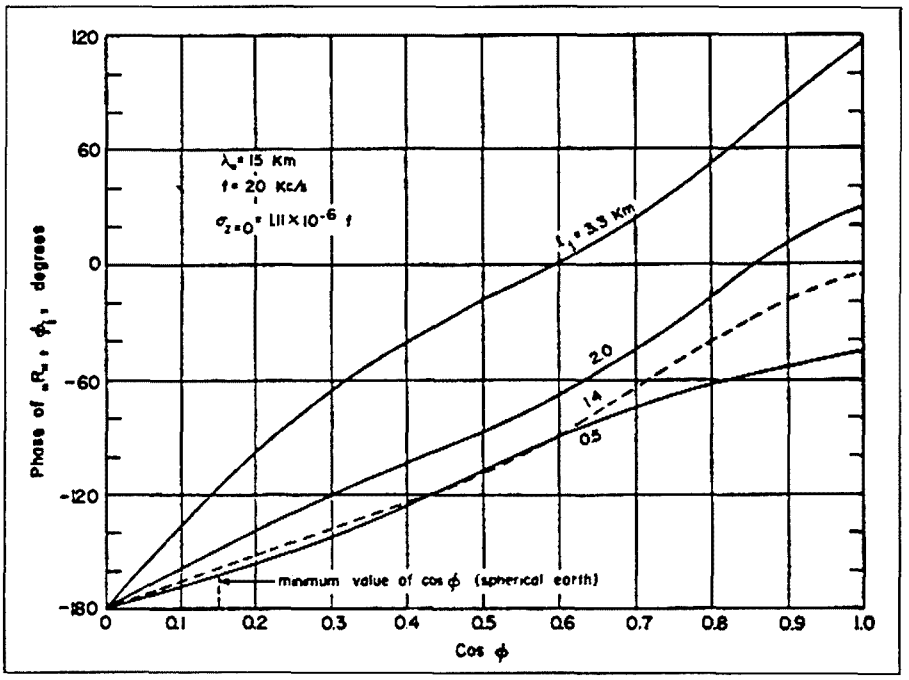
The effective refractive index 'n of an ionised medium is given by:

$$n = \sqrt{1\text{-}81N/f^2} \qquad (4)$$

where N is in electrons per cubic metre and f is in Hertz, N is usually in the order of $1x10^{11}$ to $7x10^{12}$. It is obvious from this formula that *n* can have a value less than 1 or less than 0 (unreal). If a wave is projected vertically into the ionosphere and is turned around by the process of refraction, then not only must the refractive index be less than 1, it must equal 0. Substituting $n=0$ into the above formula we come up with the often quoted formula:

$$Nmax=fc^2/81 \qquad (5)$$

where fc is critical frequency and the formula tells us the ionisation density necessary to return a vertically projected signal to earth. Thus a vertical signal of a given frequency will pass into the ionosphere to a point where the electron density equals Nmax from where it will be returned to the earth's surface. If the



Phase of the ionosphere reflection coefficient as a function of the angle of incidence for various conductivity gradients.

angle of incidence is greater than 0° or the take-off angle is less than 90° to the ground, less ionisation is required to return the signal (see ref 1 and 2). For an angle of incidence greater than 0:

$$N=(f \cos i)^2/81 \qquad (6)$$

As referred to above, we know that refractive indices cannot normally be less than 1 or the wave propagation would be faster than light (or even faster than infinity)! When a radio signal passes through the ionosphere the electrons are caused to oscillate and, since they have mass, some energy is used in overcoming inertia. If there are no collisions between electrons and atoms there is no energy lost, and the energy in the oscillating electrons is returned to the system in the form of radiation in a different phase from the original. The process of taking energy and returning it to the system is known as *reactive* and is directly analogous to a capacitor or inductor in an electric circuit in which lossless current is drawn by the component. As referred to above, refractive index is directly related to permittivity. The ionosphere with its low refractive index also has a permittivity less than 1, and can be looked upon as analogous to capacitors in the sky! Energy being absorbed and re-radiated in this reactive medium is the effect that results in the wave being reflected or refracted.

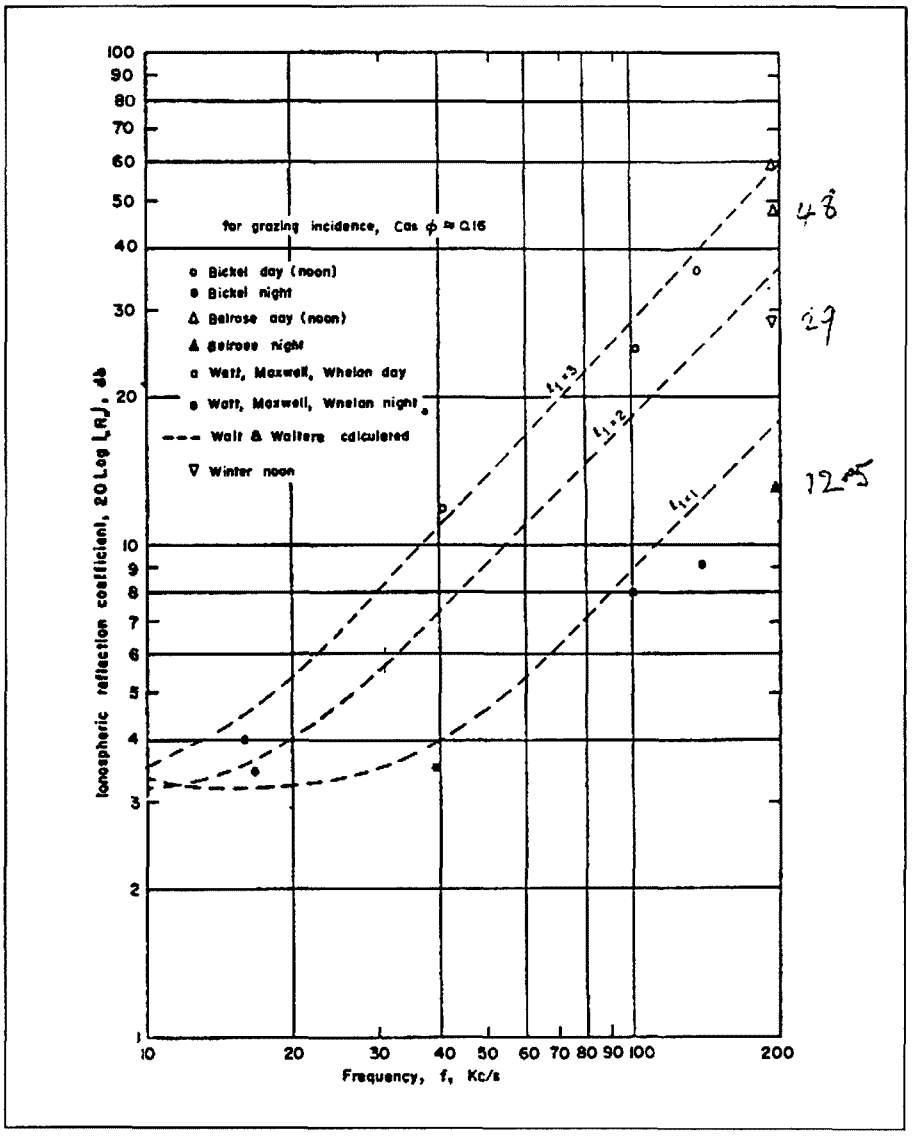
So this behaviour of electrons in the ionosphere causes it to behave like a medium with a refractive index less than 1. What about waves travelling faster than light? We all know this is impossible. What actually happens is that the wave has two velocity components, phase velocity vp and group velocity vg (ref 2). This is a characteristic of propagation in a medium where the velocity is a function of frequency. With the phase velocity, the carrier waveform appears to move forward in time. At the same time, because of the reduced group velocity, the modulation on the wave appears to slow down. We, therefore, have a rather negative kind of refraction and reflection of HF radio waves in the ionosphere. While the wave appears to speed up as it is bent round and returned to earth, it actually slows down. The interested reader is referred to the many texts on this subject, including the reference above.

Ionospheric Absorption at HF

At the lower edge of the ionosphere there is a rather mysterious region we call the D region. The D region lies between 70 and 90km above the earth; it has no critical or maximum usable frequency but causes loss to signals passing through it at HF. Loss in the layer is large in daylight and practically negligible at night. Its loss increases with decreasing frequency and is high enough to form an almost complete blanket to sky-wave propagation below 2MHz in the daytime. This layer prevents long-distance communications over daylight paths on 7MHz and, to some extent, on 14MHz.

The D region is of great importance in LF propagation and will therefore be dealt with in more detail in the next section.

(to be continued)



A comparison of observed and calculated ionospheric reflection coefficients vs frequency for near grazing angles

References

1. "Why is There a Maximum MUF. Amateur Radio Action, Vol 6, No 6, 11 Oct '83
2. Transmission and Propagation Services Text Book, Vol 5, 1958, H M Stationery Office, 1958Appendix 14.3 and Chapter 14. Also many other similar texts. ar

Errata

Sweep Generator Circuit, Page 9 *AR* April 1991

Some anomalies have been brought to my attention in the connections to N3, the MC1496 balanced mixer. The output pins omitted should be 6 and 9. Also, resistor R18 should connect to pin 5, not pin 6. The pin connections shown are for the TO5 metal package and will be different for the plastic DIL package. The other packages, N1 and N2, are both DIL.

Lloyd Butler VK5BR ar

Feedline Losses and VSWR

GRAEME MCDIARMID VK3NE
10 WOODSTOCK DRIVE, TULLAMARINE 3043

FOR THOSE INTERESTED IN THE effect of feeder losses on VSWR measurement at VHF, here is some food for thought.

To achieve the SWR readings shown below I have used the following figures:

1. Frequency 146MHz
2. Feeder length 30 metres

a) RG8 has a loss of around 3dB at 146MHz

b) RG58 has a loss of around 6dB at 146MHz

SWR Reading at Transmitter	Coax	SWR at Antenna
1.1:1	RG8	1.21:1
1.2:1	RG8	1.44:1
1.5:1	RG8	2.33:1
1.6:1	RG8	2.71:1
1.7:1	RG8	3.14:1
1.8:1	RG8	3.65:1
1.9:1	RG8	4.25:1
2.0:1	RG8	4.67:1
1.1:1	RG58	1.47:1
1.2:1	RG58	2.13:1
1.5:1	RG58	8.81:1
1.6:1	RG58	23.6:1

The results for RG58 show that a large increase in SWR at the antenna will only give a very small increase at the transmitter.

A Practical Example

Using a typical twin-needle SWR meter you obtain the following readings:

Forward power = 16 Watts, reflected power = 1 Watt

VSWR (where the needles cross) = 1.7:1

While 1.7:1 is not a particularly good reading, it is quite acceptable, and most VHF transmitters would produce close to full output (16 watts or more from a 20-watt TX).

What do these readings mean?

1. If you used RG8, you probably have a VSWR of 3.14:1 at the antenna. This is a fairly high figure and it should be possible to improve it by making various antenna adjustments.
2. You used RG58. This situation is very different than the previous one. It indicates that your antenna may not be connected, or there is a short/open circuit at or near the feed point.

How did I arrive at the answer for RG58?

The two power figures shown above give the reason. If you feed 16 watts into a cable that has 6dB loss, only four watts will arrive at the other end (6dB is a power ratio of 4:1). A cable that is not terminated or has a short circuit will reflect all of the power that arrives there. This means that four watts will be fed back down the cable. Again a 6dB loss will occur, and only one watt will arrive at the SWR meter. The ratio of 16 watts forward to one watt reflected is a VSWR of 1.67:1.

Summary

This has been a brief look at VSWR from a practical angle. You may think I haven't been very practical in looking at an antenna feedline using 30 metres of RG58.

How often have you heard of someone using a long length of thin cable of dubious origin?

A shorter length of poor quality cable, or a length of good quality cable that has been damaged could have losses exceeding 6dB.

Don't think you are safe because you have used the best quality cable you could afford.

(a) What happens if water gets into the cable?

(b) What happens after a few years of flexing and UV exposure?

(c) Some cables suffer from contamination due to the plasticiser used in the outer jacket.

(d) The figures provided are for VHF; by how much does the loss increase if you decide to move up to 430-440MHz or higher?

It makes common sense to use the materials you have at hand or can afford. High feeder loss may not be a problem where there is sufficient power output, or signal strength is very high.

At times I have deliberately introduced additional feeder loss so that the transmitter will see a reasonable VSWR when using an antenna not designed for that frequency.

Try using an external, elevated 70cm antenna instead of the rubber ducky on your handheld. If the existing feeder has 2dB loss at 2m, and the VSWR is approximately 3:1 (at the bottom of the co-ax, 9:1 at the antenna), a 20m length of RG58 will bring the VSWR down to 1.5:1).

I have provided this information to help you make more sense out of the readings you obtain when measuring VSWR at the shack end of your co-ax. Just be aware of what effects feeder loss may have on the readings you take.

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Getting started with amateur radio satellites

PART 6

BILL MAGNUSSON VK3JT,
359 WILLIAMSTOWN RD,
YARRAVILLE 3013

I HOPE YOU'VE HAD SOME success with Oscar-10 or Oscar-13 over the past month. If you've kept your station up with the series you should now be able to cope reasonably well with many of the current batch of amateur radio satellites. Next month I'm going to discuss digital communication satellites and look at their store and forward, BBS and digipeating capabilities.

Flavour of the month is AO-13. If we look at setting up an optimum station to work through this bird and add a good, multi-mode modem, it will cope with just about anything the future will hold.

Let's look at AO-13 in a bit more detail than the brief coverage last month. You'll remember I mentioned it had a mode B transponder. It also carries mode J; that's the reverse of mode B. So, if you've got a transceiver for 2m and one for 70cm, or one of the multi-band, multi-mode jobs, you're set up for both these modes of operation. AO-13 also carries a mode L transponder. This is a UHF to microwave device. It listens on 435MHz and has a downlink on 1269MHz (23cm). This one is not much good to us here in Australia at the moment. The orbit of Oscar-13 is drifting further into the northern hemisphere and, as it does, the apogees will occur below our horizon most of the time. This is unfortunate, as mode J and mode L are only turned on near apogee to take advantage of the best squint angles. Our operating through AO-13 will be restricted to mode B for the next two or three years, when once again AO-13 will drift towards the southern hemisphere. The drift is affected by the inclination. AO-13 has an inclination of nearly 57 degrees. It was designed to have an inclination of 63 degrees. If the orbit insertion had gone according to plan and the inclination had turned out to be exactly 63 degrees, the satellite would not have drifted. It would have stayed orbiting with the apogee a little north of the equator. At that inclination all the gravitational forces acting on the satellite are in balance. Such an orbit is called a Molniya orbit after the Russian satellite which first used it. Molniya is the Russian word for lightning. Many commercial satellites are launched into this type of elliptical orbit.

AO-13, ie Amsat Oscar-13, has another transponder on mode S. This is also a UHF to microwave device. It has an uplink on 435MHz and a downlink on 2400MHz. It is also scheduled on for short periods around apogee. You need very good squints to successfully work modes L and S.

If we wanted to work all these modes we'd need antennas and SSB rigs on 145, 435, 1269 and 2400MHz. This is quite a tall order, but many operators do it. The higher frequencies can be transverted up from 145 and 435MHz. The antennas don't present so much of a problem as they get smaller and easier to handle. An entire array for all these can be mounted on the one AZ/EL rotator system. At the higher frequencies, of course, feedlines, pre-amps and plumbing become a problem. If you're already a microwave operator you have a head start here. If not, it may well be wise to concentrate on modes B and J and fully investigate them before moving on to something quite a bit more demanding like modes L and S.

Our optimum station would require a reasonable amount of power, say 50 watts, to cover all conditions. You would need this on 145, 435 and 1269MHz. Fortunately no transponders uplink on 2400MHz ... yet. The receive systems would need to go for the best part if 18dBi in the antennas. And that's not easy. You would need a pre-amp, definitely a GaAsFET on the higher frequencies. It MUST be mounted at the feed point.

If you are thinking of working any of the digital modes, you will need to put together a computer controlled antenna pointing system. Probably the best one is the Kansas City Tracker. This can work in conjunction with several modern tracking programs, and has the added feature of the Kansas City Tuner which takes care of Doppler shift automatically on your downlink. This is a real boon for digital operation.

Last month I mentioned circular polarisation. The majority of antennas carried on amateur radio satellites are circularly polarised. DX operators are familiar with the way signals received by ionospheric refraction are knocked about quite badly by fading due to random polarisation changes. All satellites operate outside the ionosphere. I'm sure you've realised that already. They wouldn't last long in amongst it. This means that all satellite signals must pass through the ionosphere to get to your station. As well as this, most satellites either spin or tumble in orbit, causing the polarisation of their signals to change or even reverse. The best way of handling these problems is to employ circular polarisation at both ends, and your end needs to be switchable from right to left hand. There are many ways of generating a circularly polarised signal. Let's look at a few. The crossed dipole or turnstile is the best known. This is useful for receiving and transmitting to low-earth orbiters like DOVE, UoSat and RS-10/11. It consists of two dipoles, usually horizontal and mounted at right angles to each other. One is fed directly by the co-ax feeder, and the other is fed via a $^1/_4$ wave feeder from the feed point of the first. The hand of polarisation can be changed by changing the feeder to one end or other of this $^1/_4$ wave "phasing" section. You can mount the turnstile $^5/_8$ wave above a ground plane to give it a kidney shaped vertical radiation pattern which is useful for satellite operation. You can be really clever and use a relay at the feed point to change from right to left hand if you like.

It's well to remember that all circularly polarised antennas only exhibit true circular polarisation directly along their axis. As you move away from the axis, the polarisation becomes elliptical, ie it has more of one linear polarisation than the other. This is not a bad problem, as with tracking antennas you will be trying to point as closely as possible at the satellite. With the turnstile you just have to put up with it. I guess you could track the turnstile, but if you're going to do that you may as well go for a better antenna.

You can make your turnstile into a crossed yagi. This is essentially two yagis mounted on the same boom, but at 90 degrees to each other. They are fed in the same way as the turnstile. With a $^1/_4$ wave

phasing harness that can be switched to give right or left-hand polarisation. This arrangement is very popular. You would find this type of antenna at nearly every satellite operator's QTH. You can make the boom as long as you feel you can cope with. Boom lengths of three to four wavelengths are not uncommon. Combined with a good pre-amp up at the feed point, this setup is hard to beat. The pre-amp will overcome feeder losses on receive but remember that your transmit signal will benefit greatly if you use only the best co-ax for all satellite work.

The helix is an excellent antenna and well worth a try. But if you're going to build one, make sure it's a good long one and don't take ANY short cuts along the way. A helix is a bit cumbersome at 2m, but some operators use them. On 70cm a boom length of only three metres will give a gain of 19dBi(c) if you take care with the construction. That term dBi(c) needs a bit or explanation. It means decibels over an isotropic source and truly circular. This represents an advantage over our crossed yagis of some 3dB for the same boom length. The reason being that the feed is split to feed both yagis so each one gets only half the power. You get that back at the other end, of course, if the other antenna is also circularly polarised and the signal arrives intact (which it may not). With the helix you also overcome losses incurred in the phasing harness.

The only disadvantage of the helix is that it cannot be switched from right to left-hand polarisation. This probably accounts for its unpopularity. They certainly work well. If you want to try one, make it right hand, as this is the most widely used system on the satellites.

If you've followed this series right through you'll have realised by now that this satellite business is rather wide and rather complex. It's the sort of thing you can devote a lot of time to if you get the bug. As I said in the very first opening paragraph, you must hasten slowly. Your enjoyment will depend a great deal on up-to-date information. There's a lot of information available, but much of it gets out of date rather quickly. My advice is to get hold of a good basic text, read it thoroughly and keep referring. *The Satellite Experimenter's Handbook* from ARRL is good value. It contains lots of practical projects and good basic, easy-to-understand operating hints. The RSGB's VHF-UHF manual is great for general information on equipment for use in this part of the spectrum.

I'd also strongly advise that anyone with an interest in amateur radio satellite operation should join a special interest group, in our case, Amsat Australia. You can get details from Graham VK5AGR at GPO Box 2141, Adelaide 5001. He distributes an excellent up-to-date newsletter full of useful information. You can also keep an eye on your local packet BBS. These are also a good source of information. Lastly, of course, the satellites themselves have bulletins coming down with the telemetry stream. A serious operator would do well to exploit all these means to keep well informed.

Next month, digital communications by satellite and a complete list of presently operating satellites.

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Don't buy stolen equipment - check the serial number against the WIA stolen equipment register first

Further Experiments with Horizontal Loops

BY JOE ELLIS VK4AGL
BURNSIDE RD NAMBOUR 4560

SINCE WRITING THE FIRST PART of this article I have had an opportunity to erect an 80m horizontal loop at my own property and, although it takes many months of observations to come to proper conclusions on any antenna, here are some comments for what they are worth.

It has become clear to me that any antenna is conditioned by its own environment. By this I mean that adjacent buildings, towers, guy wires and trees modify results obtained at other locations. For instance, the identical antenna erected east of Gympie performs well on 10m; here it does not perform all that well, and does not auto-tune with the TS440S transceiver.

I have had communication on most amateur frequencies, with the best results on 20m against the reference antenna which is a TH6DXX. On 40m it outperforms the reference antenna , which is a dipole. While in contact with 9X5NH in Central Africa, on 17m, I noted that the report given me was about the same as those given to other stations in Australia. The loop seems to transmit better than it receives; this may be because the TS440S auto-tunes the transmitter, but not the receiver, without modification.

The Horizontal Loop concept continues to excite attention overseas, and much experimental work has been done. Paul Carr N4PC has done some computer modelling which has now been published in *CQ* magazine. He has also tried the loop with the corner opposite the feedpoint opened. This virtually turns the loop into a rhombic. One bonus from this move was that it became a fairly efficient radiator on 160m. It is, after all, just a dipole now folded back on itself. There can be no argument with the criticism that the loop is just a cloud-warmer on the fundamental frequency of 80m. For this reason, Paul N4PC has come up with further experiments using a $^3/_4$ wave loop. This works out at 51 feet per side, and the immediate result is that the vertical pattern is split into two lobes with maximum radiation at 40^0.

The horizontal pattern is essentially omni-directional. It should be noted that Paul uses 450 ohm balanced feedline, whereas here we have tried both RG58 and RG59 coaxial cable.

Paul claims no expertise in antenna theory. He says that in Alabama there is a saying: "If you place a blind hog under an oak tree, it will eventually find an acorn." He thinks he has found his acorn. I will reserve my own decision until many more observations are made here at this QTH. ar

Cover Story

Darcy Hancock VK5RJ, who is featured on the cover of this issue, has been a licensed amateur since 1927, and a WIA member continuously since the 1930s. For most of this time (until about 1960) he was handicapped by the fact that the power supply in his home town of Kadina was 200 volts DC. It was changed to AC not long before he retired from his electrical contracting business and moved to Adelaide in 1965.

Darcy operated mostly CW in the early days, but was also active on phone (AM was then the only mode). He is still active on most bands using a commercial SSB transceiver.

Nevertheless, he still does some home-brewing of small items like test equipment.

Comparing past years with the present, Darcy remembers that noise levels were very low in the 1930s. It was not at all unusual to be able to listen to American stations on the AM broadcast band, but, as Darcy says, "Now, with all the noise-making appliances connected to the power mains, it is a very different situation."

When he began operation in 1927, Darcy's callsign was A5RJ and, later, OA5RJ. The prefix VK for Australia dates only from 1929. May we continue to hear and work VK5RJ for many more years to come! ar

Support the WIA in order to protect amateur radio frequencies at WARC 92

Random Radiators

RON COOK VK3AFW &
RON FISHER VK3OM

AS USUAL, WE HAVE FOUND some interesting antenna stories for you this month. However, a few observations on some of our past articles. As mentioned in our last episode, we expected to have some feedback on the Quad vs Yagi story, but so far not a word from anyone. Where are all the Quad enthusiasts out there? I guess it must be a fact that Yagis do outperform Quads. I must admit that I have never used a Quad, but I am open to suggestion. In fact, if there is a Quad owner who thinks he has a world-beating antenna out there and would like to put it to a side-by-side test with a Yagi, one of the two Rons has two towers where such a test could be carried out. Any takers?

Our first story this month is from Rod Torrington VK3TJ. Rod says that over the years he has not had complete success with antenna coupling units; however, an ATU described in the 1965 ARRL handbook has proved to be 100 per cent successful on all bands, including 10, 18 and 24MHz. Rod says that it's an ARRL idea and not his, which might be true, but thanks for bringing the idea to us. Over to you, Rod.

Antenna Coupling Units

Experience has shown that some antenna coupling units may be quite satisfactory on some bands with some aerials, but will not load up on all amateur high frequencies.

The circuit shown here has proved to be very versatile, and it was possible, due the various circuit configurations (see A through E) to load a co-axially fed 20m/40m trap double as a random wire (ie with the inner and outer of the co-ax tied together) on all bands from 160m to 10m with a VSWR at the transmitter (a TS530s) no worse than 1.2:1.

The *ARRL Handbook* 42nd edition 1965 supplied the circuit. The switching to any one of the five L and C combinations can be performed by a three-pole five-position switch (not readily available these days) - see figure 2 or, quite conveniently, with six banana sockets and three jumper leads terminated in banana plugs - see figure 1.

Normal two-gang broadcast receiver (the old valve type) capacitors (approx 20 to 400pF) were used; only one gang on each connected. The capacitors need to be at least 150pF. No arc-over has been experienced on any band wish the TS530s.

A multi-position switch can be used for coil tapping, or an arrangement for connecting a wandering lead clip to the coil tap points can be made.

More on indoor and minimal space antennas.

Some months ago we discussed a few antennas that could be set up either inside a room or, perhaps, in the roof space of a home unit. We got very little feedback on this from readers, but I know there are many amateurs out there who feel that they cannot get on the HF bands because of antenna restrictions.

First, a story that might encourage some of the reluctant to give it a try, and then a description of an interesting indoor loop transmitting antenna.

A few months ago, I worked a station in Milwaukee USA on 20m. Not unusual, I hear you say. True, but he was mobile. (Still not too unusual). But he was mobile riding a bicycle. (Ah!) The station was WB9GIE, and the operator (rider?) Elroy Shelley. Elroy was using the following equipment: A Ten-Tec Argonaut 509 QRP transceiver running all of three watts output, powered by a set of alkaline "D" cell batteries. His antenna, a Hustler mobile whip mounted on the rear parcel carrier of his three-speed Raleigh bicycle. At the time of our contact, Elroy was pedalling his way to work on the north-west side of Milwaukee along the shore of Lake Michigan. Elroy says that so far I am his best DX, but I gather that he works around the US on a regular basis. He also works 2m with an ICOM IC-2AT. The photo tells the whole story. While it is obviously not the usual thing for Elroy to work into Australia, it does go to show that an amateur in a home unit or a small flat using, say, an indoor dipole and 100 watts output, should be able to produce many satisfactory contacts, at least around Australia. But, read on; we might have something even better than an indoor dipole.

The Magnetic Loop Antenna

The transmitting loop antenna is creating a lot of interest amongst indoor antenna users. It is relatively easy to construct and doesn't take up a lot of space. This one was described in the April 1988 issue of the English magazine, *Ham Radio Today,* by Tom Hall GM3HBT. I have actually worked at least six "G" stations which were using anten-

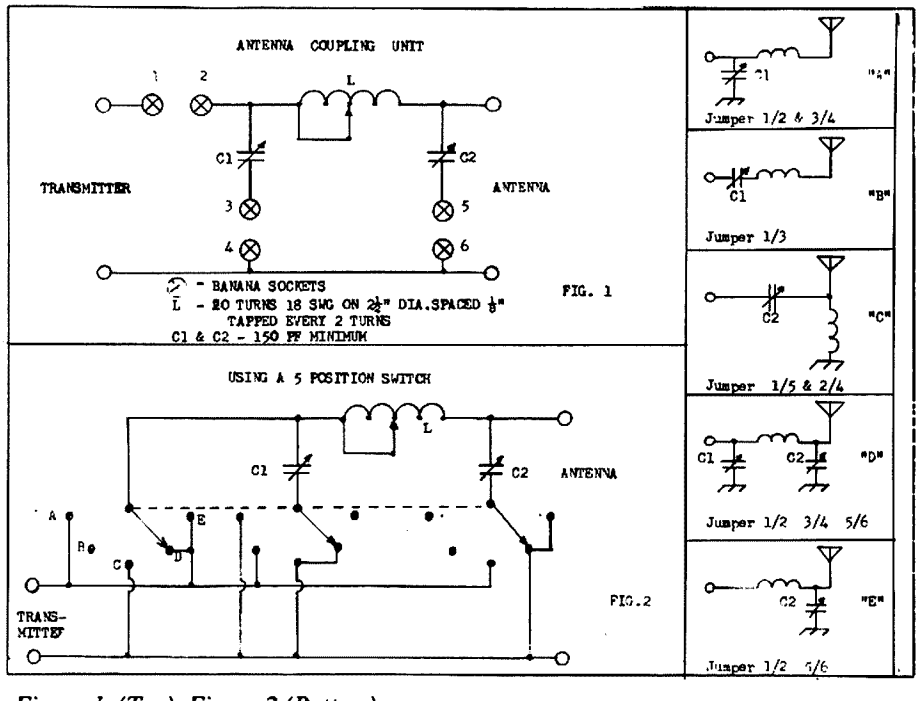


Figure 1. (Top). Figure 2 (Bottom)

nas similar to this. Transmitting loops antennas are available commercially in the UK, but are actually quite expensive, due to their construction. They feature full remote control for both tuning and rotation. However, for indoor use, a home-built one might cost only a few dollars. The construction is simple and is shown in detail in the drawing. The loop is made from 3m of 12-15mm diam soft copper tubing. The tuning capacitor needs to be wide spaced with a maximum capacitance of 100 to 200pF. The lower capacitance will tune from 10 to 18MHz, while the higher capacitance will tune down to 7MHz. Unless your capacitor has a very low minimum capacitance, it is unlikely the loop will tune up to 28MHz. In most cases, a slightly smaller loop will be needed. The capacitor also needs to be of very solid construction, as resistance losses in the rotor bearings can make a significant difference in overall performance. Some loop users suggest that a split-stator capacitor is actually superior, because it eliminates most of these losses. Because the tuning of the capacitor is very sharp, a 6:1 reduction drive is desirable.

The Matching Stub

Some loop antenna designs show a separate small coupling loop at the base of the main loop, but this design uses a much simpler and much less critical gamma match system. The flange of a standard SO-239 co-ax socket is soldered to the base of the loop and its centre pin connected to a piece of stiff co-ax braid about 20cm long. This is bent over in a semi-circle to a point on the loop about 15-18cm out from the connector. The best actual spot for a compromise match on the bands covered by the loop must be found by experiment. Now all you need to do is connect the loop antenna to the rig via a length of 50-ohm coax cable.

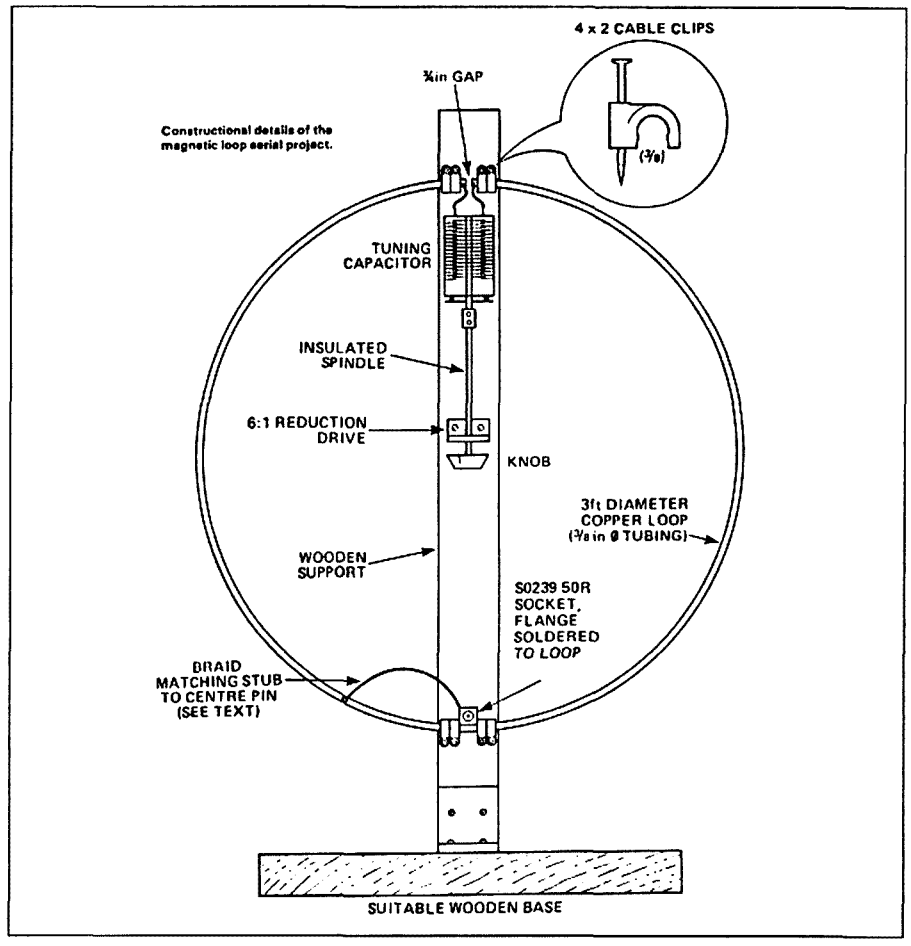
To tune the loop for normal operation, peak the tuning capacitor when receiving on the frequency required. There should be a sharp increase in band noise at resonance. Now transmit a low power carrier and tune again for minimum SWR. If this is not near unity, adjust the position of the stub until a low SWR is reached. With careful adjustment, the SWR should be below 1.5:1 on all bands.

I have actually got one of these loops going at the moment, and find that it tunes exactly as above. However, results achieved have not been as good as expected. I am working on this, and will report back in the near future. Also, Lloyd Butler VK5BR has been working on a similar loop and his article will appear in *AR* very soon.

Again, thanks to *Ham Radio Today* for permission to reproduce its drawing and to quote from its article. *HRT* is a magazine I can recommend. It is available through many of the larger Australian bookshops or can be obtained direct from HRT Subscriptions Dept, Select Subscriptions Ltd, 5 Riverbank Park Estate, Berkamsted, Herts HP4 1HL UK. Price 27 pounds, 50 pence.

And that's all for this month, so its good bye from him and good bye from me. *The Two Rons.* **ar**

WB9GIE Bicycle Mobile. The antenna shown is for 2 metres. The 20M Hustler is normally mounted on a bracket on the end of the parcel carrier.



Magnetic Loop Antenna

TECHNICALITIES

COMPILED AND CONDUCTED BY ROGER HARRISON, VK2ZTB

THIS COLUMN IS DEDICATED to disseminating practical, do-it-yourself hints, tips and techniques for the amateur interested in experimenting, tinkering and homebrewing — the "Saturday arvo solderer rules, OK!"

Variable Ceramic Resonator Ceramics

I've always found the long-running "Technical Topics" column conducted by Pat Hawker G3VA in the RSGB's *Radio Communication*, an absolute gold-mine of material over the years. I guess many other amateurs have, too. So you can expect me to extract items from it on a fairly regular basis; he extracts plenty of items from our own *AR* anyway!

An item that caught my attention in the February '91 issue of *RadCom (p 30)* was on variable ceramic-resonator oscillators. Ceramic resonators are low-cost piezoelectric devices having characteristics between an LC circuit and a quartz crystal. They look not unlike a ceramic capacitor and are widely used in TV colour burst oscillator applications (3.58 MHz and 4.43 MHz), video games and computers. Their Q and stability is better than an LC circuit, but somewhat less than a crystal. They are considerably cheaper than quartz crystals. Many electronics retailers in Australia carry them.

As with crystals, you can "pull" a ceramic resonator's frequency using a variable capacitance in an oscillator circuit. As it turns out, you can pull the frequency much more than with a quartz crystal of a similar frequency. Obviously, a ceramic resonator could be used in VFO applications.

Hawker reports on the work of John Townend G3BBD with a variable ceramic-resonator oscillator. The general idea is shown in Figure 1. He used a 3.58 MHz ceramic resonator, gaining a variable frequency range of some 70 kHz, stretching from 3.522 to 3.590 MHz, which readers will note neatly covers the Australian Novice segment on the 80 metre band.

The circuit uses one inverter stage from a 4069 CMOS hex inverter IC, in a Pierce oscillator arrangement. A 375 pF variable capacitor (e.g: a broadcast tuning gang) provides the frequency shift. Townend reports that the arrangement gives good frequency stability provided that the temperature remains reasonably constant.

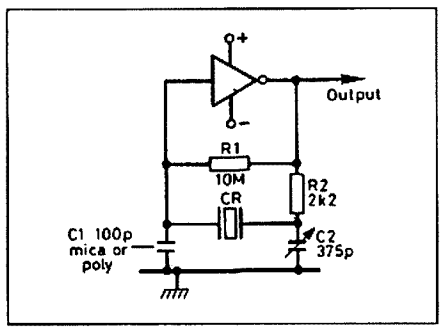


Figure 1. You can make a tolerably good variable frequency oscillator for the 80 metre Australian Novice band by "pulling" the frequency of a 3.58 MHz ceramic resonator oscillator, as reported by G3BBD. The active device is one inverter from a 4069. CR is the ceramic resonator. About 70 kHz shift is obtained, much greater than can be achieved with a comparatively expensive quartz crystal. Good frequency stability is obtained without special efforts, provided the temperature remains reasonably constant.

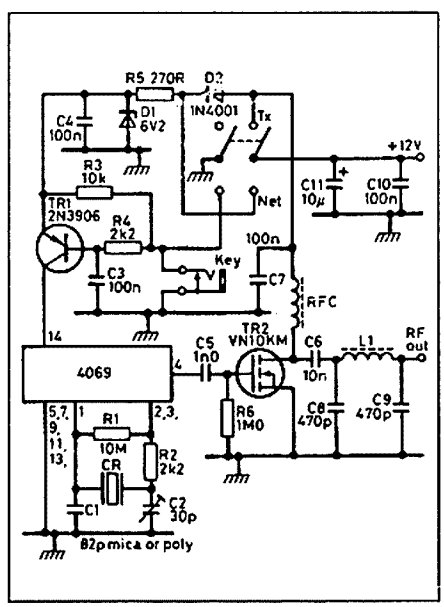


Figure 2. Example of an 80 metre QRP transmitter, built by G3BBD, using the ceramic resonator variable oscillator of Figure 1. It covers about 3520 to 3590 kHz.

Townend's circuit of a QRP 80 metre transmitter is given in Figure 2. The 4069's power supply pin is keyed to provide full break-in operation. Another inverter in the 4069 (pins 3-4) is used to buffer the oscillator stage (pins 1-2). TR1 could be a BC557. I think C2 is incorrectly labelled "30p", it should be a 375p variable capacitor.

The VN10KM provides an output of a little over one watt, Townend claims. "Construction is extremely simple and, provided care is taken to ensure a reasonably constant temperature around the oscillator, temperature drift is minimal. In practice it was found to be less than 200 Hz during the course of a 30-minute QSO," he reported.

I might add that the idea could certainly be used in a receiver, too.

General-purpose RF preamp

For any RF enthusiast, a "general purpose" wideband RF amp with 50 Ohm inputs and outputs is a most useful device. I noticed a neat and simple circuit in an article by the indefatigable Doug DeMaw W1FB in the January '91 issue of *QST*. The article's entitled "A Diode-Switched Band-Pass Filter". Filters are naturally lossy and hence his project includes an RF amp to compensate.

While the project shows a bipolar transistor RF amp stage, Doug says the bipolar transistor is a little noisy for use in receiver front end applications and suggests the use of a common-gate JFET stage, as reproduced here in Figure 3.

Input and output are matched using broadband RF transformers wound on Amidon toroids (available from RJ & US Imports, who advertise in Hamads each month, and also from Stewart Electronics). T1 is 4:1, T2 is 10:1 (contrary to what it says on the circuit). Winding details are given in the caption. All capacitors are disc ceramic types and the resistors are 1/4-watt carbon film or carbon composition types. Stage gain is around 10-11 dB and the circuit configuration results in a stable amplifier.

Having 50 Ohm input and output impedance allows you to "insert" the amp in front of a receiver or frequency counter, for example, to boost sensitivity, or at the output of an oscillator to provide buffering and boost the output level.

This circuit should work over the range from the lower HF region (1.8 MHz) through to the lower VHF region (60-80 MHz).

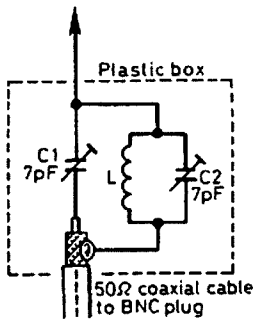


Figure 4. End-fed 2m antenna and matching section, by HJ Brandt DJ1ZB. The 7pF trimmers should be high quality VHF/UHF types; Brandt used air-spaced trimmers from Tronser. Try Stewart Electronic Components for something suitable. The coil is 5 turns of tinned copper wire (gauge not specified, but 18g would do), wound on a 5 mm former and slipped off then pulled or squeezed to a length of 8 mm. If C2 has to be set at either end of its range, vary the coil by squeezing (C2 at min.) or opening (C2 at max.) the coil.

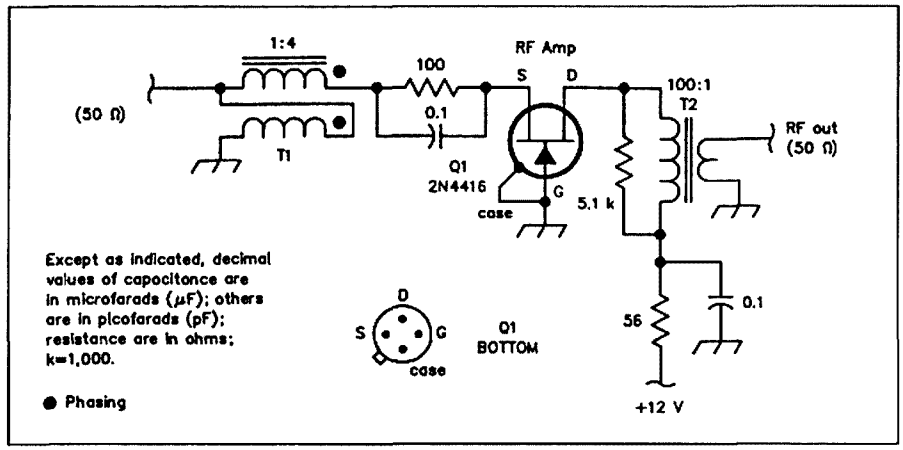


Figure 3. General purpose, wideband RF amplifier, from a project by Doug DeMaw W1FB. T1: wind 15 turns, bifilar, of no.28 enamelled copper wire on an Amidon FT37-42 ferrite toroid The spots indicate the start (or finish) of each winding. In other words, you connect them "in series". T2: primary is 30 turns of no.28 enamelled copper wire wound on an Amidon FT50-43 ferrite toroid; secondary is three turns of the same wire.

Construction should be fairly non-critical, but keep all component and connecting leads as short as practicable; use good RF construction practices.

End-fed antenna for 2m handhelds

The ubiquitous "rubber ducky" flexible whip for two-metre handhelds are anything but efficient. Convenient in a physical sense, yes; efficient, no. In Technical Topics in the January '91 issue of RadCom, Pat Hawker published a letter from HJ Brandt DJ1ZB, who sent in a 1985 article of his from the German *Funk* magazine on an end-fed 2m antenna.

Brandt showed that his antenna design gave an improvement of at least 9 dB over a rubber duck antenna, enabling him to access repeaters with his handheld switched to 300 milliwatts where he had to use the rig's full 2.5 watts with the rubber duck antenna. Not bad!

His end-fed antenna employs a telescopic whip or rod of 80 to 133 cm, with a matching network enclosed in a small plastic box at the base. (He used a 57 x 28 x 28 mm box).

The arrangement is shown in Figure 4. A flange or bulkhead type BNC plug mounted on the box allows the antenna to be mounted directly on the rig. Or, it can be mounted separately and connected to the transceiver by a length of low loss 50 ohm coax.

The matching section capacitors are adjusted for peak field strength at minimum SWR. The longer the whip, the more "gain" you get, compared to a rubber duck. Brandt reports a whip length of 90 cm gave 7-11 dB improvement, while 116 cm gave an improvement of 11-15 dB.

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Anniversary Contest

An expedition devoted to the 500th anniversary of Zaporozhye Cossacks is planned for 21 to 28 July 1991. Expected callsigns:

RY1QH	-	isl. Khortisa, Zaporozhye Sech
RY2QT	-	Tomakovka Sech
RY3QB	-	Bazaluk Sech
RY4QM	-	Mikytin Sech
RY5QC	-	Chortomlyk Sech
RY6QO	-	Oleshkov Sech
RY7QK	-	Kamenska Sech
RY8QN	-	Now Sech
RY0QQ	-	base station, Tokmak

Operation will be on all HF and VHF bands, SSB and CW; RTTY in some instances.

To receive the Award, five QSOs for Europe, three QSOs for DX are required. The cost is five IRCs.

QSL via UB0QZ, Valentin Dolinny, PO Box 4900, Zaporozhye, 330076, USSR.

Technical Correspondence

Programs Vs Know-how

TECHNICAL WRITINGS ABOUT aerial wires and rods for the reception and transmission of radio waves are referring more frequently to computer programs which calculate aerial characteristics. The name of the program is "dropped" authoritatively and with awe to impress the reader that the results are the last word and brook no argument.

That philosophy discourages self-training and technical investigation by giving the impression that the knowledge is locked away in an exclusive possession of the author. As Lady Lovelace said about the Babbage "engine" - "It has no pretensions whatever to originate anything. It can do whatever we know-how to order it to perform."

The "know-how" comes only with understanding and, to paraphrase Lord Rutherford - "If you can't understand the theory maths you can't understand." A computer program is not a substitute for understanding.

My first experience of a program for calculating aerial characteristics dates to the mid '70s. A writer quoted computer calculated characteristics of Quad aerials. The results could not be supported by applied array theory; the programmer's know-how was incomplete.

On the subject of that often repeated "soapie" quads versus Yagi - will someone prove, with documented array theory, the truth or otherwise of the following:

(i) the gain of an isolated element of a square loop Quad is the same as the gain of an isolated half-wave dipole; both referred to the field from an isotropic source;

(ii) the addition of parasitic elements to a Quad produces the same gain improvement as the addition of similarly spaced and tuned parasitics to a half-wave dipole;

(iii) the presence of ground has the same effect on both arrays.

The proof can be arrived at almost intuitively, but added mathematical analysis makes it more convincing. Quoting "Annie" or "Minimec3" calculations as proof demands too much credulity.

LINDSAY LAWLESS VK3ANJ
BOX 112, LAKES ENTRANCE 3909

The direction of amateur techniques

The current province for the amateur is in single-channel specialities, whether it be Rx, Tx, antenna or mode. The versatility of modern multi-band equipment guarantees that compromises - many of them - have been made. Likewise, multi-band antennas can seldom, if ever, combine optimum bandwidth, gain, vertical angle and front-to-back ratio. Single-frequency antennas can be optimised or have one facet emphasised, with a reasonable chance of success.

Over the past decade the development of VHF and UHF equipment was assisted by their being single-band units. Only recently has two-band equipment of comparable ability appeared in the marketplace. The message is clear - if you want to be a front runner, pick a band and have a go.

Long distance high speed commercial links use diverse reception, where multiple antennas each feed a separate receiver and the outputs are combined or selected for the best signal result. An amateur, struggling to get some sky-wire up, can reasonable ignore this, or can he? Loops, ferrite rods and active antennas do not take up much room, even in a unit! Solid-state mono-band receivers now fit into a small die-cast box, and switching circuits can operate so that high-speed sampling for the best signal is possible.

There are convenient packages to count 16 cycles and then sample the next source. On 1.6MHz this is a 10 micro-second sample, fast enough to select the best components of the signals and combine them for the enhanced performance of ALL pulse systems. This is an avenue for all operators to explore for that QSA5 signal.

ROBERT R MCGREGOR VK3XZ
2 WILTSHIRE DRIVE, SOMERVILLE 3912

ar

TRY THIS

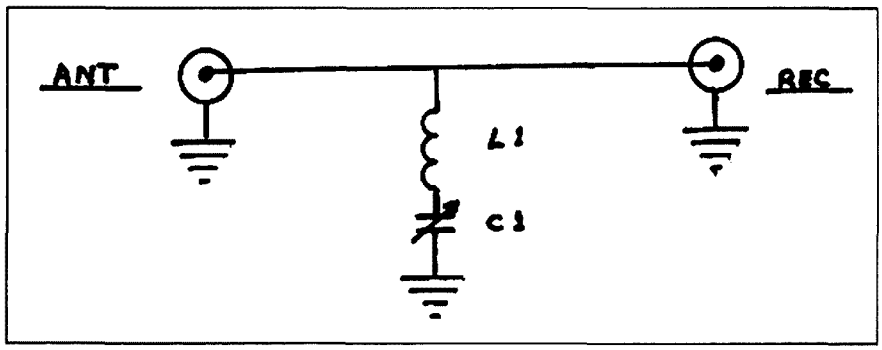
Image Tester

Have you ever wondered if you are actually listening to intruders in our bands or are you listening to an image. There is a useful low-cost gadget to determine if you are listening to an image or not.

The idea is to insert a calibrated series tuned trap into the antenna line to the receiver and to tune the trap across the band, if the image is reduced or disappears when tuned to other than the frequency of the receiver, the signal is an image.

C1 100 or 150PF variable
L1 8 turns 22SWG 1¼ diam
and 5 turns 22SWG 1¼ diam
plus in coils

Range 5MHz-15MHz approx
and 13MHz-23MHz



To Calibrate:

Connect as shown in diagram 1. Couple GDO to L1, tune C1 for null and mark dial. Note: varying coupling may change calibration point slightly; couple loosely if possible.

This idea was suggested by Dan W8ZCO way back in 1967.

Thought you may like to try this simple circuit one rainy weekend.

Bob Tait VK3ERG ar

The Balloon Goes Up!

GEOFF ATKINSON VK3YFA
35 BERRINGA RD, NORTH RINGWOOD 3134

FROM AN IDEA BROUGHT TO the committee of the Eastern & Mountain District Radio Club Inc by a member, Joe Magee VK3BKI, who was then to become the Project Co-ordinator, a very successful day was held on 11 May 1991. The club launched a meteorological balloon carrying a modified Philips radiosonde to record and transmit temperature data via a homebrew 2m transmitter on the "foxhunters" frequency of 144.250MHz.

The balloon was launched from the club's new premises at the Knox Boat Fishing Club rooms at the Schultz Reserve in Wantirna (Melway 63K6) at 1114 hours EST after a minor delay caused by insufficient lift being available from one balloon. A second balloon was quickly inflated and attached to the original and liftoff was achieved without further incident. The balloons are inflated to approximately 1.2m in diameter for the launch, but expand during ascent to reach approximately 8m before exploding and sending the payload back to earth in the care of the parachute (not packed like a skydiver's chute!!).

The weather was overcast and drizzling, but this did not stop a large group of club members, other amateurs and approximately 160 interested members of the public from attending this unique event in the suburbs. KZ-FM included news of the launch in its 10am news broadcast, and this along with news promulgated on numerous bulletin boards and by the amateur "grapevine" alerted a very large number of people to the event and resulted in its ultimate success. The balloon was visible for about 1000 feet after liftoff and then was lost in the clouds and we relied entirely on signal reports and beam headings being reported on the four net frequencies manned by enthusiasts. Along with the reports from base and mobile stations, we were fortunate to also receive information from Melbourne Radar at Tullamarine Airport as to the direction of travel and range of the balloon. It was carrying a radar reflector which provided adequate capture area for the radar.

Needless to say, this is not the sort of project that can be conceived and put into effect immediately. Great encouragement was received from the Bureau of Meteorology, which also donated the two balloons, and Joe was able to obtain much valuable technical data from them to assist the project. Liaison also had to be effected with the Department of Aviation to ensure the balloon did not lift off in the path of a Jumbo, or be responsible for a nasty incident. Clearance was obtained via a car phone (wonder device) and so we proceeded with the launch.

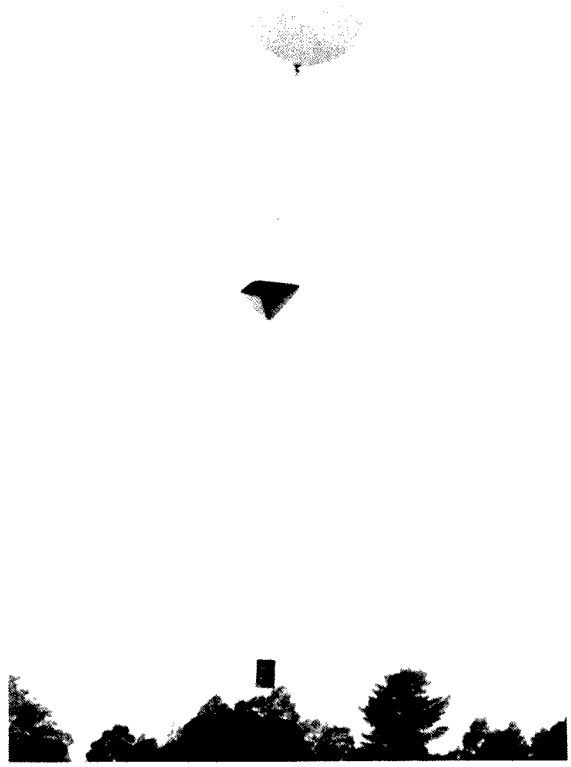


Photo showing balloon, parachute, radar reflector and transmitter/sensor. Photo by David Nisbet VK3XDA.

Reports from the Met Bureau's two earlier launches on Saturday indicated that the wind was from the south-west and therefore the balloon would head off in a north-easterly direction towards Yarra Glen or maybe further.

The project was of great interest to a special group of amateurs commonly known as "foxhunters", as normally their "fox" is limited in how far he can go or get off the ground, so a new challenge became available and it was taken up with great enthusiasm by many teams.

Signal reports were many and varied, and a total of some 760 reports was logged, with calls coming from VK1, 2, 3, 4 port 5, 5 and 7, which was a most pleasing result.

The balloon rose to approximately 16,000m (16km) (50,000 feet) before it began its descent phase, and the foxhunters were doing well in their pursuit of the payload.

As part of the preparation, two computer programs were written to provide information on the balloon heading and also to decode the transmitted signal for analysis of the temperature data. A final assessment has yet to be carried out. The payload eventually returned to earth (almost; it got stuck in a tree) and was located by Ian VK3YQN from the Healesville Amateur Radio Club, who will be rewarded for the successful return of the payload to the club. VK3BMV Ewen actually climbed the tree to retrieve the load. It is interesting to note that three foxhunting teams arrived within about 10 minutes of each other. The balloon payload came down at Snobs Creek, near Lake Eildon, a distance of 54 miles, or 87 kilometres from Wantirna, and total elapsed time from liftoff to recovery was four hours and one minute.

The project was photographically recorded as well as videoed to ensure a record of the event is maintained.

A special certificate is being presented to stations which respond with signal reports and $5 to Box 87, Mitcham 3132, as well as a QSL card to acknowledge participation in the event.

As a club we could not have achieved the great results we did without support of a large number of people, as well as some commercial sponsors, namely Philips Communications Systems, Bright Star Crystals, Monash University for the loan of the balloon launcher, Powerhouse Electronics for the special battery pack used to power the transmitter, and Baker Radio for technical assistance.

Needless to say, plans are being formulated for another balloon launch, but this time with a different payload. ar

Youyi Wansui — Long Live Friendship

友谊万岁！

WALLY WATKINS VK4DO
PO BOX 262
AIRLIE BEACH 4802

IT WAS A GREAT HONOUR FOR the Wireless Institute of Australia and myself to be invited to China by the Chinese Radio Sports Association to give a series of lectures to amateur radio clubs in Beijing and Nanjing. As we understand, this is the first tour of its kind by a Western amateur to new China.

Preliminary discussions were held during the 1985 IARU region III conference with Deputy Secretary General Wang Xun. Further talks were held during my later visits to Beijing in 1987 and 1988.

The main thrust of the lectures was the explanation of the relationship between the Department of Communications and the Wireless Institute of Australia, the syllabus and conduct of examinations, together with the development of amateur radio clubs in Australia. Some of the lectures were for non-amateurs, so time was spent explaining "what is amateur radio" and the benefits to the individual and international understanding. An explanation of IARU and the orderly development of amateur radio throughout the world was also covered.

Time was taken to visit BY1BH, BY1SK, BY1QH and BY1BJ where old friends greeted me and general discussions took place.

At BY1BH, part of a special school, the Dean extended a warm welcome and told that they supported 34 activities amongst 300 students. There are 10 departments, including technology, art and sport as well as a library. The school has government finance and is open six days per week (not Monday) particularly during afternoons and early evenings.

Sections visited were computing, technology, choral and Beijing opera. Students at the technology section were making printed circuit boards with a sharp knife instead of etchant. They would welcome old PC boards for parts, as their supply is not great.

The students for these special schools are selected by primary and middle school teachers because they show a budding expertise in a particular field. This is developed and usually leads to majoring in that field at university.

Director Huang at BY1SK explained that his station is part of the science and technology club and promotes the construction of equipment. The students are involved in community work in their spare time, serving the people and making no charge for repairs to electrical and electronic appliances. The 400 students' ages range from 12-17 years and they are supervised by 40 teachers. Huang is a ham and hopes to have a 2m repeater operating soon.

The Qinghua University station, BY1QH, has 10 students and is experiment oriented. Only a general discussion took place as there was no power that day for their area.

At BY1BH, manager Wang was interested in getting details of simple 2m equipment, and a fine discussion took place with students about the Australian way of life.

Two days of lectures took place at BY1PK for officials of the Chinese Radio Sports Association and station managers from Beijing stations. This was followed by two very busy days operating in the CQ WPX contest. (See *AR* July 90, p24. Ed).

Travel to Nanjing was in a no-frills, one-class 727 of CAAC. Refreshments for the 1.5-hour flight were a can of beer and a packet of nuts.

A particularly warm welcome awaited us in Nanjing, led by Chen BZ4RC, the secretary of Jiangsu branch of CRSA and several others from the Jiangsu sports commission and the South-east University of Nanjing. The following evening a special banquet was given in my honour where gifts were exchanged and then it was back to business. Accommodation was at the guest house at the South-east University.

A visit to a special school for fox-hunting was next on the agenda. A briefing by director Zhu was followed by an inspection of the facilities. As well as radio direction finding they teach small-bore rifle/pistol, skeet, air-rifle/pistol as well as flying model aircraft, both radio and wire line controlled.

About 30 pupils are at the school at one time for a particular activity. They spend 6-12 months there doing normal studies in the morning and training in the afternoon, plus school studies in the evening. Students are selected from 11 cities in the Jiangsu Province. Radio direction finding on 80 and two metres is a middle school activity, while 160 metres is a hobby activity for primary schools.

RDF adheres strictly to international rules. Although commercial equipment is available, homebrew RDF gear is encouraged.

Group at fox hunting school Nanjing

RDF is a time trial with contestants leaving at five-minute intervals. Adult courses are over seven kilometres with transmitter powers between 0.5 and 5.0 watts. Five transmitters are on the same frequency with differing CW idents, with the home station on a different frequency. As proof of finding the transmitter each contestant marks his card with a stamp tied to each transmitter.

An open invitation was given to me to attend the school for RDF training along with other VK amateurs who may be interested in taking part in international competition which will be held in China in 1992. After watching a demonstration by the students over rather rough terrain in a forest park on the outskirts of Nanjing, I think that if I ever partake of international RDF then it will definitely be in the OM section.

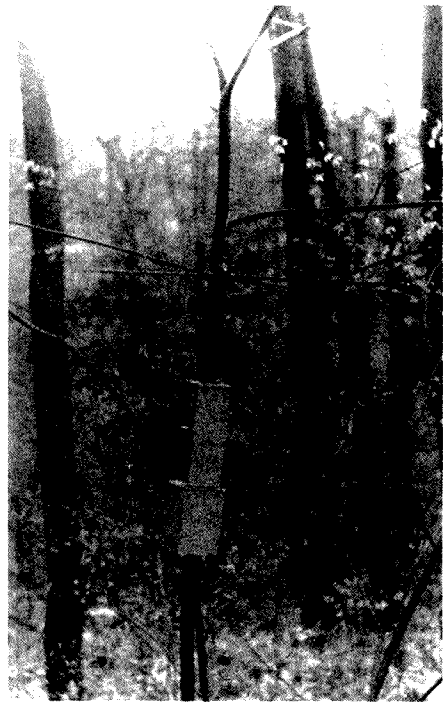
While at the South-east University, time was spent in "free talks" with various students including Xu whom I had previously contacted on 15 metres from Australia.

The visit to No 51 Middle School was arranged to promote a greater interest in amateur radio, as most of the students were active in RDF. The school has done very well by taking out championships in 1981, 83, '86 and '89. Principal Wu stated that the after-school activity, including construction, has greatly improved the students' understanding of physics. Many students have graduated into military radar units with distinction. RDF is an ongoing activity supported by the Physical Culture and Sports Commission of Jiangsu Province. The school then gave a display of RDF on 160 metres and showed a video of its activities at a national test. These activities are strongly supported by the Education Board. As well, the students learn Morse. The RDF test on 160 metres in 1988 was over four days and there was fierce competition from 200 athletes.

Another lecture was attended by 16 coaches from stations around Jiangsu Province and included Jiang from Suzhou who was very proud to have worked VK3OT on 50MHz CW. A good question time followed this session.

The biggest audience was at the South-east University. Prior notice was given through wall hangings at the main entrance for several days. Over 120 people turned up and listened with great attention.

In my spare time of a morning, one of the members of BY4WNG, Ni, arranged for a loan of a bicycle for me and we spent some time exploring various spots of interest around Nanjing. Bicycle riding in China is quite an experience. One does not see too much while riding as there are



2m fox hanging in a tree

so many other vehicles around that one must concentrate on not having an accident.

Once again at No 33 Middle School enthusiasm was shown by 100 students and teachers with good questions after the lecture.

At this school there are 850 students, 20 classes—14 being junior and six senior — with 110 teachers. Spare-time study by 80 per cent of the students in 27 groups is undertaken in such fields as physics, culture and chemistry to name but a few. Fox hunting is enjoyed by the students who have also done well in provincial and national competitions.

The final lecture was at BY4RSA, the official station of the Jiangsu branch of CRSA, before 60 members. Question time was a lively affair as half the members spoke a little English, and at times subjects ranged well away from amateur radio. After the discussion I made a mistake by giving one young girl my autograph in both Chinese and English, together with my address. What I did not realise was that another 25 wanted the same! After discussion with manager Chen Fan, an agreement was reached for BY4RSA to become a sister club of VK4WIT, the Townsville Amateur Radio Club.

On the last Sunday it had been arranged for me to visit the Nanjing radio factory in the morning. Wang arrived at 0830 and told me that the visit was off as a top-level delegation from Beijing had arrived unexpectedly and our visit would be inconvenient for the factory management, so off we went in the car with some talk of visiting a monastery. Ten minutes later we drove through some gates and, lo and behold, it was the Nanjing radio factory! Wang smiled and said in a quiet voice, "April Fool, Wally." Yes, it was 1 April!

The next day I was to leave Nanjing in order to go to the city of Changsha in Hunan Province, where I was to visit with some old friends. Chen and Wang left me at the airport at 1500 in time to catch a flight at 1530. As it was necessary to proceed through security, Chen and Wang left. However, departure was rescheduled for 1700. Right on the dot the flight crew went out to the Antonov 24, then at 1730, after an announcement over the loudspeaker, everybody went away, including the flight crew. So, putting on my best Beijing accent, I approached the front counter and found out that I should come back tomorrow at 0830!

So, without luggage, I went out to the front of the air terminal and was lucky enough to find a taxi from the Jingling Hotel, where I stayed overnight, and completed my journey to Changsha the next day, but that is another story.

The co-operation and support given to me by the Chinese Radio Sports Association in Beijing, the Jiangsu Province Sports Commission, and individual clubs in Beijing and Nanjing, were most appreciated. Special thanks go to my old friend Wang Xun, and Liu Deputy Secretaries-General of CRSA, Tong, Station Manager of BY1PK, Chen, Station Manager of BY4RSA.

Without my other two good friends Meng Chao BZ1FB and Wang, my lectures would have been impossible. The patience and understanding of technical terms showed their excellence as interpreters. In fact, after only four lectures, Wang did not really need me!

So, to all my old and new friends in China — Zaijian. ar

Have you advised the WIA Executive Office of your new callsign? Use the form on the reverse of the *Amateur Radio* address flysheet

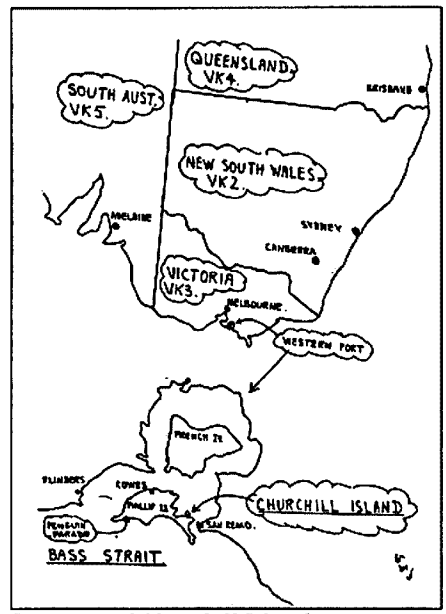
Churchill Island and Amateur Radio

DES GREENHAM VK3CO
16 CLYDESDALE COURT, MOOROOPNA 3629

AFTER VISITING CHURCHILL Island recently, we were most impressed with the restoration and careful management of the island and homestead. Many will no doubt be saying "Where is Churchill Island and what is its association with amateur radio?" Churchill Island is in Victoria and is just inside Western Port Bay, adjacent to Phillip Island, now internationally famous for the "Penguin Parade" each evening (see attached map).

The island was originally discovered by George Bass in 1798 during one of his many voyages around the south coast of Australia. As a result of Bass' venture, Governor Hunter despatched Flinders with the sloop "Norfolk" to prove once and for all the existence of the stretch of water we now know as Bass Strait. Having proven the existence of Bass Strait, further exploration was planned and Lt Grant, in a 60-ton sloop named "Lady Nelson", was sent to further explore "Western Port" in 1801. He came into the port and made several landings one of which was on a small island which he subsequently named after Mr Churchill, a farmer in Devon who had given him some seeds and vegetables to plant somewhere in the "new land". Grant chose Churchill Island to plant the seeds etc. He felled numerous trees and formed a garden. With easy soil to dig, he planted wheat, corn, peas, rice, coffee, berries and potatoes. He also planted stones and kernels of several fruits he had on board, not forgetting apples. Grant then returned to England and may never have learned the success or otherwise of his planting. A year or so later, Lt Murray returned to Bass Strait and called into Churchill Island to find wheat and corn growing two metres tall! He also found onions and other produce growing.

This is the earliest history of Churchill Island. In 1857, an English migrant landed there and set up his home. He and several other farmers successively cultivated and developed the island until more recent times. In 1936, Dr Harry Jenkins, a Melbourne dentist, bought the island primarily for his son, Edward, who held an amateur licence and the callsign VK3QK. Ted, as he was more commonly known, had, as a result of a diving accident, become a paraplegic. Ted operated his station from his wheelchair, and was a well-known operator on the air waves. He operated from Elwood, a Melbourne suburb, and from Churchill Island, where he had an extensive antenna farm. To care for Ted, his father engaged Sister Campbell, who was with him continually, including his frequent visits to the island.



Location of Churchill Island

During the years I knew Ted personally, he frequently told me about the island. He also related the story of an old cannon set up in the garden on the island. This cannon, dated 1863, was originally installed on an American Confederate vessel, the "Sea King" which visited Melbourne in 1865 seeking provisions. The ship's commander, Lt Waddell, presented the cannon and a stock of cannon balls to Melbourne councillor, Mr Samual Amess who was, at that time, the owner of Churchill Island. The cannon was set up on the island and remains there to this day. In the early post-war years, Ted and his family made a ritual firing of the cannon on every New Year's Eve to celebrate the forthcoming year. At that time, Ted told me he had enough stock of cannon balls for the next century! Sadly, Ted died in 1960, and his father died later in 1963. Dr Jenkins bequeathed the estate to Sister Campbell who had been a companion and help to Ted during his short unfortunate life. Sister Campbell continued the farming activities on the island until 1973 when, due to ill-health, she made the decision to sell the island. It was purchased by Mr Classou and, more recently in 1976, the island was purchased by the Victorian Conservation Trust at a price of $400,000.

The original homestead has been restored for tourists, and more restoration is current. The garden still retains its original beauty, and the old cannon is firmly in place although it is a long time since it was last fired, the New Year's Eve ritual being dropped after Ted's death.

Today, there is nothing left of Ted's radio activities on the island; his antennas have all disappeared, and there is no evidence of his "shack". Ted was a well-known amateur in the post-war era and was an inspiration to many other people to "go for a licence". Some of Ted's influence spread to nearby San Remo, where a young man interested in radio subsequently became VK3BWD and is now our VK3 Federal Councillor.

The island is now an increasingly popular tourist attraction with a vehicular access bridge. Tourists from all parts of the world now see how life was on Churchill Island but, sadly, there is no reference at all to the part played by the late Ted Jenkins VK3QK.

ar

Prevent pirates. Make sure you sell your transmitter to a licensed amateur

VNG News

MARION LEIBA VK1VNG, VK1BNG

ON 1 MAY 1991, AUSTRALIA'S standard frequency and time signal service, VNG, was issued a licence on 12.984MHz. This frequency is on loan from the Royal Australian Navy and we are most grateful to them.

The transmission on 12.984MHz will be double sideband at 10kW power, but with the bandwidth restricted to 3kHz at the Navy's request. Also, VNG is not permitted to transmit voice on this frequency, but the letters "VNG" will be in Morse.

The frequency synthesiser for the 12.984MHz broadcast is being built in the Geology Department of the University of Tasmania in Hobart by Vagn Jensen VK7VJ.

The 12.984MHz transmission is expected to commence around the end of June. Until then, the five and 10MHz transmissions will continue as before, and 16MHz will be broadcast from 2200-1100 UTC each day.

VNG Facts

Location: International Transmitting Station, Civil Aviation Authority, Llandilo, New South Wales, Australia, 33°41'52"S, 150°47'33"E

Transmitters: STC HF broadcast transmitters, 10kW carrier power

Emission: Double-sideband full-carrier amplitude modulated telephony

Aerials: Wells quadrants

Temporary Transmission Schedule:

5MHz: continuous

10MHz: 2200-0700 UTC — No time pips during 9th, 10th and 11th minutes, and from 46th to 52nd minute inclusive on 10MHz only. Carrier continues uninterrupted.

16MHz: 2200-1100 UTC

Voice Station Identification Announcement:

Given during the 15th, 30th, 45th and 60th minutes without interruption to the time signals. The speech is "notched" to allow seconds markers to continue and has special components around 1000Hz removed to avoid erroneous operation of tuned relay time circuits. The text of the normal announcement is:

"This is VNG, Llandilo, New South Wales, Australia, on 5, 10 or 16 Megahertz. VNG is an Australian standard frequency and time signal service. Enquiries may be directed to:

VNG Users Consortium, GPO Box 1090 Canberra, ACT, Australia 2601

Time Code: The time code format was published in *AR* in December 1990 (p26).

ar

Book Review

QTC (I HAVE A MESSAGE FOR YOU)

IAN CROMPTON VK5KIC,
9 CRAIG ST, RICHMOND 5053

A BOOK ABOUT HISTORY OF radio and the place and function of CW in that history? Well, be fair, reviewer, the place and function of CW in one phase of that history.

Interesting history, including references to matters hidden under the Official Secrets Act of one country or another until this sort of historical material, 30 years and more out of date, became archival, and therefore publicly available.

A book by a ship's radio officer (retired) Looking at SOS or XXX calling procedures and at several SOS situations. Looking at considerable length at some of the theories proposed in court, and in one book or TV spectacular or another, about the sinking of the "Titanic". Expressing a viewpoint on practicality born of experience at sea in a position where a rescue, achieved or not, could at ANY time start only hours away.

And expressing the thought that massive disaster becomes probable as soon as there ceases to be an emergency calling procedure independent of power from the ship's engines. As soon as obligatory watch procedures on the single worldwide frequency of 500kHz ceases in 1999.

This silence and listening on 500kHz is on three minutes twice each hour, and by alarms triggered by an obligatory procedure before putting out an XXX or SOS call. Alarms are switched on whenever the operator leaves the shack. This will cease when UHF, VHF on several frequencies, and satellite operations, all basically voice, with the intelligibility problems related, replace this procedure on one frequency.

Well written, I feel, well enough for me to have read it in one session of four hours.

Title: *QTC (I have a message for you)*, by "Sparks", whose name appears only in one page in the book. Wonder whether you will find it?

Publisher: Sequoia Press TX, 2502 Cockburn Drive, Austin, Texas 78745, United States of America. ar

WIA News: From page 6

transmission lines and a single wire quadrant aerial. The present 16 MHz (formerly 15 MHz) transmitter will be used for 12.984 MHz and the current 16 MHz quadrant will be modified for this purpose. The present 10 MHz transmitter will be used for 8.638 MHz with a spare single wire quadrant which will be remade. The 5 MHz transmitter and Wells quadrant aerial will remain as is.

If there are no problems with completing the line work, we hope to start transmitting on 8.638 and 12.984 MHz at 0000 UTC on 3 July 1991.

Please note that transmission on 10 MHZ is expected to cease at 0700 UTC on 2 July 1991.

From 3 July 1991, all going well, VNG's new transmission schedule will be :-

5.000 MHz, 8.638 MHz, 12.984 MHz : continuous 16.000 MHz: from 2200 - 0500 UTC.

Thanks to Ron Henderson VK1RH, David Wardlaw VK3ADW and Brenda Edmonds VK3KT for their invaluable assistance with this month's news.

Bill Roper VK3ARZ

DON'T BELIEVE US?

"The Best of the Best!"... That's what Yaesu and Dick Smith Electronics think of the FT-1000 deluxe HF all-mode transceiver. But don't believe us- read what the experts have to say...

On documentation

"clearly written and complete, and includes a complete set of schematics and many high quality photos" — QST "The quality of printing and presentation of this book is the best I have seen..." — AR

On operation

"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the icom IC-781 or the Kenwood TS-950S." — ARA "...I found the FT-1000 easier to learn and use than any other radio in its class." — QST

On the receiver

"On receive, the performance was often beyond the limit of the latest professional measuring equipment, with no measurable trace whatsoever of synthesizer phase noise." — PW "...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." — QST* "The direct digital synthesizer works very well and produces receiver performance that sets new standards." — AR "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter — SSB

"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST "Reports were all very favourable, especially when using the speech processor." — AR "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

Transmitter — CW

"CW keying was a delight...power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." — AR "On CW the FT-1000 was absolutely faultless." — ARA "CW operation with the internal keyer is a breeze... in QSK CW operation, the rig has well shaped and weighted keying." — QST

Transmitter — RTTY/Packet

"Using the set on HF packet was an absolute pleasure..." — PW "RTTY and packet radio operation with the '1000 are straight forward..." — QST "Packet and RTTY modes were tried and proved just superb." — ARA

Conclusion

"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW "...the FT-1000 represents unbeatable value..." — AR "It is an excellent set worthy of accolades and rave." — ARA "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST*

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver, and easy to use controls put it far ahead of the competition. Wouldn't you rather be using the "Best of the Best"?

Cat D-3200

2 YEAR WARRANTY

$4995

including MD-1 desk mic

Magazines

ARA — Amateur Radio Action Vol. 13, No. 2
AR — Amateur Radio August 1990
PW — Practical Wireless January 1990
QST — ARRL QST March 1991 *(review with optional filters fitted)
Copies of these and other reviews plus our 12 page colour brochure are available upon request. Phone (008) 226610 or (02) 8882105.

DICK SMITH ELECTRONICS

B1158

Serious Amateurs Deal With The Professionals

VHF/UHF BASE STATION ANTENNAS

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Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x $^{5}/_{8}\lambda$ co-linear
Cat D-4850

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2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x $^{5}/_{8}\lambda$(2m), 4 x $^{5}/_{8}\lambda$(70cm)
Cat D-4860

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23cm ANTENNA F-1230A

Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
Length: 3.06m
Type: 25 x $^{1}/_{2}\lambda$ co-linear
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Cat D-2920

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See A.R.A review Vol 12. Issue 5, or A.R. review Aug '89 issue.

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CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CONTEST MANAGERS)

Contest Calendar

July
13-14 IARU HF World Championship Contest
20 Sunshine State Jack File Memorial Contest
20 Colombian Independence Day Contest

August
10-11 European DX Contest - CW
17-18 RD Contest
17-18 Keymen's Club of Japan CW Contest

September
7-8 32nd All Asian DX Phone
14-15 33 Scandinavian CW Contest
14-15 European DX Contest - SSB
21-22 33 Scandinavian Phone Contest

October
5-6 VK-ZL Oceania DX-SSB
13-13 VK-ZL Oceania DX-CW
26-27 CQ WW DX Phone Contest

November
8-10 Japan International DX Contest
9-10 European DX Contest RTTY
23-24 CQ WW DX CW Contest

December
7-8 ARRL 160m CW Contest
14-15 ARRL 10m CW and Phone Contest

The 15th West Australian Annual 3.5MHz CW & SSB Contests

Transmitting & Receiving Rules

1 **Duration**
CW Sunday 3 August
SSB Sunday 7 September between the hours of 1030 and 1330 UTC time ie three operating hours for each contest

2 **Frequencies**
All contacts to be made in the 3.5/3.7MHz band using frequency allocation applicable to your licence conditions

3 **Calling**
Stations will call CQ WAA using the three-times-three technique. Infringement of this rule by the use of long CQ calls may entail disqualification, as will prearranging of a QSO.

4 **Scoring**
Points for contacts are as follows:
Within Western Australia 5 points per contact
WA to all mainland eastern states 2 points per contact
WA to VK7 4 points per contact
WA to VK0 and overseas 8 points per contact
3 points per contact with WA stations only

5 **Multipliers**
A multiplier of two per WA shire worked will apply to the final score
WA stations north of the 26th parallel only: an additional multiplier of 1.3 will apply per confirmed contact with stations south of the 26th parallel

6 **Contacts**
Stations may be worked twice on each night, ie once between 1030 to 1300 UTC, and again between 1300 to 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 RST/RS 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 RST/RS plus a running number starting at 001.

7 **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	Call	RST	RST	Shire	Shire	Points
Z	Wkd	Out	In	Letters	Multiplier	Claimed

Column 7 to be totalled at the foot of each page and the running totals brought forward. The last page to contain the following summary: Total number points scored; input power, equipment and antennas used, along with comments on the contest in general. SWL participants score as above using the outgoing TX score.

All logs should be addressed to the WAS Contest Committee, 42 Kennedy Street, Melville WA 6156, and posted so as to reach us not later than 4 October for both contests. The results for all contests will be published in the December issue of *AR*.

Shire Identification Letters

1	Albany Town	AT
2	Albany	AL
3	Armadale	AK
4	Augusta/Margaret River	AM
5	Bassendean	BA
6	Bayswater	BW
7	Beverley	BV
8	Boddington	BO
9	Boulder	BD
10	Boyup Brook	BB
11	Bridgetown/Greenbushes	BG
12	Brookton	BK
13	Broome	BE
14	Broomehill	BH
15	Belmont	BL
16	Bruce Rock	BR
17	Bunbury	BY
18	Busselton	BN
19	Canning	CA
20	Capel	CL
21	Carnamah	CH
22	Carnarvon	CN
23	Chapman Valley	CV
24	Chittering	CI
25	Claremont	CT
26	Cockburn	CR
27	Collie	CE
28	Coolgardie	CG
29	Coorow	CW
30	Corrigin	CS
31	Cottesloe	CO
32	Cranbrook	CK
33	Cuballing	CB
34	Cue	CU
35	Cunderdin	CD
36	Dalwallinu	DU
37	Dandaragan	DN
38	Dardanup	DP
39	Denmark	DK
40	Donnybrook/Balingup	DB
41	Dowering	DR
42	Dumbleyung	DG
43	Dundas	DS
44	East Fremantle	EF
45	East Pilbara	EP
46	Esperance	ES
47	Exmouth	EH
48	Fremantle	FM
49	Gingin	GG
50	Gnowangerup	GP
51	Geraldton	GN
52	Goomalling	GM
53	Gosnells	GS
54	Greenough	GR
55	Halls Creek	HC
56	Harvey	HY
57	Irwin	IN
58	Kalamunda	KA
59	Kalgoorlie	KL
60	Katanning	KG
61	Kellerberrin	BN
62	Kent	KT
63	Kojonup	KP
64	Kondinin	KD
65	Koorda	KO
66	Kulin	KU
67	Kwinana	KW
68	Lake Grace	LG
69	Laverton	LV
70	Leonora	LA
71	Mandurah	MB
72	Manjimup	MP
73	Meekatharra	MK
74	Melville	MV
75	Menzies	MZ
76	Merredin	MD
77	Mingenew	MW
78	Moora	MA
79	Morowa	MR
80	Mosman	MS
81	Mukinbudin	MU
82	Mullewa	ME
83	Mundaring	MG
84	Murchison	MH
85	Murray	MY
86	Mt Magnet	MM
87	Mt Marshall	ML
88	Nannup	NP
89	Narembeen	NN
90	Narrogin	NG
91	Narrogin Town	NT
92	Nedlands	NL
93	Northam	NM
94	Northam Town	NO
95	Northampton	NH
96	Nungadin	NG
97	Peppermint Grove	PG
98	Perenjori	PJ
99	Perth	PH
100	Pingelly	PY
101	Plantagenet	PT
102	Port Hedland	PD
103	Quairading	QG
104	Ravensthorpe	RT
105	Rockingham	RM
106	RoebourneRB	
107	Sandstone	SS
108	Serpentine/Jarrahdale	SJ
109	Shark Bay	SB
110	South Perth	SP
111	Stirling	ST
112	Subiaco	SU
113	Swan	SW
114	Tambellup	TP
115	Tammin	TM
116	Three Springs	TS
117	Toodyay	TY
118	Trayning	TG
119	Upper Gascoyne	UG
120	Victoria Plains	VP

121	Wagin	WN
122	Wandering	WD
123	Wanneroo	WO
124	Waroona	WR
125	West Arthur	WA
126	Westonia	WS
127	West Pilbara	WP
128	Wickepin	WI
129	Wiluna	WU
130	Williams	WL
131	Wongan/Ballidu	WB
132	Woodanilling	WG
133	Wyalkatchem	WY
134	Wyndham East Kimberley	WE
135	West Kimberley	WE
136	Yalgoo	YO
137	Yilgarn	YN
138	York	YK

Rules for the 1991 VK-ZL-Oceania DX Contests

1. SSB; from 0100 UTC 5 October until 0100 UTC 6 October 1991

1a. CW; from 0100 UTC 12 October until 0100 UTC 13 October 1991

1b. **Receiving:** times as in 1, and 1a

2. Only one contact per mode per band is permitted. All bands EXCEPT WARC bands may be used

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. NB: Oceania stations are those which qualify as Oceania for WAC

4. **Final Score:**
Multiply the total QSO points by the sum of all VK/ZL/Oceania prefixes worked on ALL bands (the same VK/ZL/Oceania prefix worked on a different band counts as a different unit)

5. **Cyphers:**
Exchange a five or six number composed of RS(T) report plus a three-digit number beginning at 001 and increasing by one for each QSO on that band

6. **Logs**

(a) Separate logs for each band, please, and for SSB and CW sections

(b) Show date, time UTC, call of station contacted, cyphers sent and received

(c) Indicate clearly each NEW VK/ZL/O prefix worked. Underline, highlight or show in a separate column, as in WPX

(d) State QSO points claimed for each band

(e) State VK/ZL/O prefixes claimed for each band

(f) Summary sheet to show:
*Callsign
*Name and address of operator
*Total QSO points claimed on all bands
*Total VK/ZL/O prefixes contacted on all bands
*Total points claimed
*Signed declaration that the rules have been obeyed
*Post your entry to:
WIA VK/ZL/Oceania Contest Manager, Frank Beech VK7BC, 37 Nobelius Drive, Legana, Tasmania Australia 7727.
Entries to arrive before 25 January 1992

7. **SWL Section:**
A VK/ZL or Oceanian station must be heard in a contest QSO. Logs to be set out as in the Transmitting section

8. **Awards:**

(a) Special certificate to the top scorer in each Continental area

(b) Special certificate to the top scorer in each country when there are more than five entries from that country, or if less than five entries from that country, scores more than 500 points

(c) Participation certificates to all others on request (three IRCs for postage please). Copy of relevant results (one IRC & SAE please).

Information for VK and ZL Stations

Check with overseas rules

Rules 1, 2, 5 and 6 as for overseas stations (except in rule six deadline)

Rule 3: Scoring

Different points for contacts on different bands are as follows:

160m	20 points
80m	10 points
40m	5 points
20m	1 point
15m	2 points
10m	2 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 ocunt as W6, not W1.

VK and ZL stations are permitted to contact each other ONLY on 160 and 80m. VK/VK; ZL/ZL and ZL/VK contacts are permitted on 160 and 80m ONLY.

Rule 6: Logs

VK and ZL logs to arrive no later than 16 December 1991

SWL Section:

As for overseas stations, BUT;

*VK SWLs must hear and log ZL or other stations (no VKs)

*ZL SWLs must hear and log VK or other stations (no ZLs)

Rule 8: Awards

Separate awards for SSB and CW sections:

(a) Special certificate to top scorers in each call area

(b) Special certificate to top scorer in each band

Entries to: WIA VK/ZL Oceania DX Contest Manager, Frank Beech VK7BC, 37 Nobelius Drive, Legana, Tasmania 7277. ar

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169, MENINGIE 5264

(All times are UTC)

Australian Amateur Bands Beacons

Freq	Callsign	Location	Grid square
50.053	VK3SIX	Hamilton (1)	QF12
50.056	VK8VF	Darwin	PH57
50.066	VK6RPH	Perth	OF78
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.464	VK6RTW	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
144.400	VK4RTT	Mt Mowbullan	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK2RSY	Sydney	QF56
144.430	VK3RTG	Glen Waverley	QF22
144.445	VK4RIK	Cairns	QH23
144.445	VK4RTL	Townsville	QH30
144.460	VK6RPH	Perth	QF78
144.465	VK6RTW	Albany	OF84
144.470	VK7RMC	Launceston	QE38
144.480	VK8VF	Darwin	PH57
144.485	VK8RAS	Alice Springs	PG66
144.530	VK3RGG	Geelong (2)	QF22
144.550	VK5RSE	Mount Gambier	QF02
144.600	VK6RTT	Wickham	OG89
144.800	VK5VF	Mount Lofty	PF95
432.160	VK6RPH	Perth	OF78
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.445	VK4RIK	Cairns	QH23
432.445	VK4RTL	Townsville	QH30
432.450	VK3RAI	Macleod	QF22
432.535	VK3RMB	Mnt Buninyong	QF12
432.540	VK4RAR	Rockhampton	OG56
1296.410	VK1RBC	Canberra	QF44
1296.420	VK2RSY	Sydney	QF56
1296.440	VK4RSD	Brisbane	OG62
1296.445	VK4RIK	Cairns	QH23
1296.480	VK6RPH	Perth	OF78
2304.445	VK4RIK	Cairns	QH23
2306.440	VK4RSD	Brisbane	OG62
10445.000	VK4RIK	Cairns	QH23

(1) A new 6m beacon, VK3SIX, at Hamilton on 50.053 (zero beat) heads the list. Steve VK3OT says it is a supervised beacon at 100 watts erp with an antenna of stacked dipoles. It has been

installed with a view to filling the gap in regard to warnings of F2 propagation from south-eastern Australia. The present 50MHz beacons in Alice Springs and Perth cover a large portion of the western section of the continent, while Channel 0 at Toowoomba in Queensland provides some information to the north-east. The beacon is planned to run while there remains F2 propagation associated with Cycle 22. Reports are welcome.

(2) Charlie VK3BRZ advises there are problems with the Geelong beacon VK3RGG on 144.530. It was off air at the time of writing, but may be on again by the time these notes are read. Charlie also said a site in the Otway Ranges is being evaluated as a beacon site in lieu of Mount Anakie, which is close to their centre of 2m activity and can cause overload problems for operators.

Six Metres

Since the last report of the opening on W5 on 8/5 there have been few reports of long-distance DX except for almost daily openings to Japan (usually between 0200 and 0400) which continued until about mid-May, then became spasmodic.

David VK2BA has submitted very well presented confirmations of his Six Metre Standings List and included a few other comments as follows. He managed to extract five new countries this year - KG6UH/DU2, VK63AQ, 9Q5EE, FM5WD and AH6JJ/AHO, with the latter yet to be confirmed. In all, 22 countries were available to Sydney operators during March/April 1991 - KG6, DU1, JA, ZL, XE, W4, 5, 6, 7, V63, KH6, FO5, A35, YS1, V73, 9Q5, FK8, AH3, FM5, 3D2, V31, ZK1, P29, AH0 and VK. This compared with 24 in the same period in 1990, and 35 in 1989.

David said he was very impressed at the quality of some of the DX that has been worked by VK as a whole. It really has been a very good season, as some of the best DX so far this solar cycle was worked. He compliments VK7IK, who demonstrated that it was possible for VK7 to share in the DX, if one was prepared to really put in some effort.

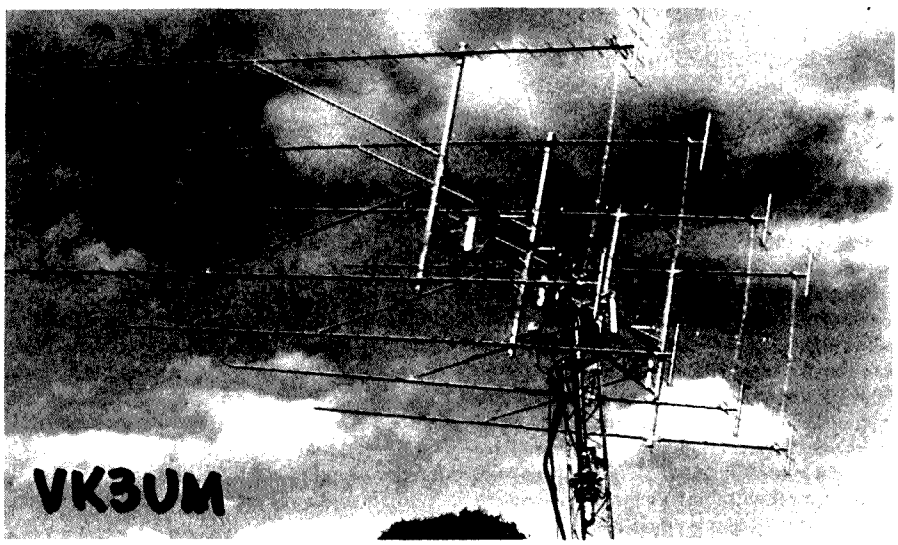
How Europe Sees It

Ken Ellis G5KW sends copies of his "VHF/UHF Message" in *Ham Radio Today* for April/May/June and refers to 6m between the UK and VK. He said that it all started on 26/11/80 when at 0955 Gordon G4BPY reported hearing the VK6RT beacon. On 27/11/80 G4BPY reported his first reception of VK6RTU in Perth from 1858 to 1909, peaking 549. At 1000 he had a crossband QSO with Andy VK6OX to make the first historic 6m UK WAC. The second QSO was with Brian G3COJ, and the third with Ken G5KW. These operators were the only three to make it, and no other two-way or crossband QSOs took place until 20/3/89, when the all-time first two-way 6m QSO took place between the UK and VK6WD.

WAC on Six Metres

The openings to VK during 11-12 October 1989 provided several UK stations with their first two-way QSOs with Australia to complete their 50MHz WAC. The VK opening began at 0920 on 11/10 with G4CCZ, G2ADR, G4FXW and G3ENZ working VK8GF, VK8ZLD and VK8KTM. G5KW worked VK3OT at 0932. During the opening on 12/10 between 0830 and 1000, many Gs had QSOs with VK2, 4 and 8, with at least eight G stations qualifying for WAC. Since then, of course, the legendary openings to Europe in 1990 and 1991 are history.

Continuing with the notes from G5KW, Ken advises that Geoff GJ4ICD worked all continents in three hours and six minutes on 3/3/91! Geoff said he switched on at 0920 and worked VK6PA; 0924 JA4MBM followed by over 70 other JAs worked. At 1028 he worked KG6DX, KE0SC/DU3, KG6UH/DU1, V73AT, KH4AF. Then from the south came TL8MB, TR8CA, G8MFE/5N2 and 9L1US. Europeans on backscatter from 180 degrees SV10E, PA, ON, F, I etc, 6W1QC, PZ1AP, VE1YX, KP2A. (Those highlighted represent the WAC contacts).



EME Antenna 8 x 7.7λ DJ9BV

Israel

Ralph 4X1IF received permission to operate on the 6m band early in February. Extra Class stations only will be permitted, using 25w output and operating from 50.100 to 50.150. Ralph has worked many stations crossband over the years and is considering running a beacon on 50.145MHz.

Other Snippets from G5KW

A station in the USSR with facilities for crossband working to 6m is UL7GCC in Alma Ata. He has a five-element beam and worked G4JCC for his first QSO on 22/1/91 at 1028.

CU1EZ in the Azores is to receive a 160w linear from JA stations; JAs are also planning a 100-200w amplifier for CN8ST in Morocco.

David ZD8DX will soon be active from Ascension Island; his QSL manager is WB2K.

Peter 9J2HN of Zambia (home callsign JK1UWY) hopes to be on 6m from May using an IC551 to a six-element Yagi.

Eric TL8MB will be operating from the Central African Republic until about September.

Cyprus 5B4 stations have been permitted on 6m since November 1990.

Martin VP8CEX is a new 6m station from the Falkland Islands. He has worked into LU and been heard in W4.

A beacon in Paraguay is ZP5AA running 5w CW on 50.0245MHz. ZP6XDW is active from that country.

From the USA

Bill Tynan WXXO/5 from QST and "World Above 50MHz" reports that on 23/2/91 N6OLD and KK6TG had an SSB contact on 24.192100GHz over a distance of 125 miles (200km). Equipment at KK6TG was about 5mW to a 16" dish and a 14dB noise figure receiver. At N6OLD, about 2mW was used into a 20" dish and a 12dB noise figure receiver. The signals were so strong that communications could be maintained with only an open waveguide at one of the stations. KK6TG runs a 300 microwatts beacon on the same band.

DXCC on Six Metres

After sitting on 99 countries for some time, on 1/2/91 GJ4ICD from Jersey heard the 9L1 beacon at 1030 at S9+ and at 1058 worked PT7NK for country 100. Later in the day Geoff worked KP2A, 9Y4VU, PZ1AP and PJ4E to finish an historic day! Congratulations! Who would have thought 100 countries would have been possible in the two and a half years that the UK has had 50MHz privileges.

Ken G5KW also reports that on 10/3/91 G4UPS ex ZD8TC worked ZP6XDW at 1341 to give

him his 100th country worked on 6m.

VHF Liaison Frequency

Charlie VK3BRZ raises again the issue of the need for one or more frequencies in the HF spectrum which can be used for VHF net purposes and for information regarding VHF openings - similar to 28.885MHz, which is used on a world-wide basis for the dissemination of news on 6m activity.

Recently a group of operators in Victoria commenced using 3695kHz on an informal basis some evenings, but need input from operators in other areas. The reason for the choice of frequency is that there is a fair chance it will be free most of the time. Charlie accepts that the chosen frequency is not available to combined novice/limited operators, but tests have indicated there is little free spectrum space in their segment. However, they would be able to listen. A daytime frequency on 20 or 40m would also be desirable. The idea has a lot to commend it, but its ultimate success will depend on the input from those who are hearing other operators, perhaps too weakly to make direct contact, or reporting on the reception of beacons. With a liaison frequency, the role of beacons will become very important, which means more attention will need to be paid to keeping the beacons active at all times.

If you are interested, you could come up on 3695kHz and indicate who or what you are hearing and/or make some skeds to test band conditions. Information could be shared relating to 144, 432 and 1296MHz. If you believe there is a more suitable frequency, then notice of such could be conveyed on 3695kHz.

From Mount Isa

Mike VK4BFO from Mount Isa reports that Steve VK4ZSH has been operating portable in the area and sharing contacts with him, also VK4AQZ and VK4KIT in Mount Isa.

From a point west of Urandangie in the Northern Territory, Steve worked all three stations on 25/4 with signals up to 5x8. He also worked VK4BFO on 26/4 and 27/4 from the same location, on 4/5 from Gregory River NT (west of the Three Ways intersection) and on 6/5 from Karumba in the Queensland gulf country. All contacts were on 144.100 SSB.

In addition to the contact with JI7DMB last month, for which he has claimed a VK two-metres record, Mike worked JI1WGM and JL1LMM on 5/5 with reports to 549, so the 2m activity in that region has its rewards!

Albany Reports

A somewhat dated, but still useful, report is to hand from Brian VK6YAU and Wally VK6WG of Albany, Western Australia, which once again confirms that there is something about that period around the end of January when consistent contacts can be made across the Great Australian Bight between Albany and stations in VK5 and VK3 on 144, 432 and 1296MHz over a path length of more than 2000km. As always, the relevant 2m beacons gave early warnings of the openings.

The first contact for the spring/summer period was on 23/10/90 at 1220 with up to 5x9 signals between VK6YAU and Phil VK5AKK on 432MHz. No QSO could be made on 144MHz. Both bands were open to VK5AKK again on 11/11/90 at 2200 and 29/11 at 0926.

Nothing further was available until 7/1/91, when Brian was alerted by the VK5 Adelaide beacon at 2145 and worked Phill VK5AKK, Mick VK5ZDR, Andrew VK5ZUC and Col VK5RO on 144 and 432MHz, and with VK5AKK on 1296 with signals 5x2.

Brian's main activity commenced on 28/1/91 at 0055 when on 432 he worked Steve VK5ZBK, then on 29/1 between 1019 and 1047 Mark VK5ZMK, Steve VK5AIM, VK5ZMK, Phil VK5AKK, Ern VK5EN and Keith VK5AKM on 144, signals between 5x1 and 5x5. 30/1 produced on 144 at 2148 VK5ZBK, 2238 David VK6UI (south of Perth), then on 432 between 1219 and 1305 VK5RO, VK5AKK, VK5EN, VK5ZGT and VK5AKK, signals from 5x3 to 5x9.

On 31/1 from 2146 to 2154 VK5AKK on 144, 432 and 1296; 2159 VK5ZDR 5x9 on 144, 2200 5x9 on 432 SSB and 5x9 on FM; from 2215 VK5BGY, VK5NX and VK5ZJA via Mount Lofty repeater; 2226 VK5RO 432 and 144, 2142 Bill VK6AS at Esperance on 144, then the following on 432 between 1038 and 1159 - VK5AKK, VK5ZUC, VK5WA, VK5ACE, VK5ACQ, VK5AIM, VK5RO, VK5ZMK, VK3AFW, VK3ZJC, VK3YTU plus VK5ZMK at 1128 on 1296 (Mark was running 800mW) 4x1. At 1200, he worked VK3JED via the Mount Macedon repeater.

The band was still open on 1/2 between 2130 and 2235 on 144 and 432 to VK5ZDR, VK5AKK, VK3AFW, VK3CY, VK5RO with signals between 5x4 and 5x9; at 2146 to VK5AKK on 1296 at 5x4. Brian reports that there were more contacts on 432 than 144MHz and five contacts on 1296MHz. Although the above contacts are from the log of VK6YAU, WALLY VK6WG was also involved.

EME News

After a very long drought, there is some EME news to report. Doug VK3UM has sent details of his monthly activity. This has been achieved using his new array of eight 7.7 wavelength DJ9BV antennas and his MGF1302 cavity preamp. Almost every contact was made as a result of random calling.

20/1/91: 0100 VE1BVL; 0950-1025 F1FHI, DL3YEE, F1ANH, F6CJG. 26/1: 1209-1350 OK1KIR, VK5MC, SM0PYP, LA8LF, PA3CSG, ZS6AXT. 27/1: 1346 RB5LGX. 1/2: 2055-2200 F1ANH, DJ9MB, YO2IS. 23/2: 1100-1250 DK3FB, DL3YEE, SM2CEW, F1ANH, G4RGK. 23/3: 0413-0530 K1FO, NU7Z. 1030-1218 RW3RW, SP5CJT, G3LQR, G4ALH. 24/3: 1248 HB9SV, DL9NDD, DL6WU.

20/4: 0255-0415 K2UYH, AA4TJ, N4GJV, W7GBI, VE1BVL, K9UIF, KD4LT, JA4BLC, WA4OFS. 0922-1107: OK1KIR, RB5LGX, LZ2AR, LA8LF, DF3RU, KG1YA, DL9KR, RA3YCR, PA3AEF, DL3YEE. 21/4: 0345-0536: VE1BVL, W7FN, K5JL, JA7BOH, VK1VP, K1FO, KB4WM. 1017-1158: VA6LGH, SM3AKW, LA8LF, SM0ERR, SM2CEW.

Most of the signal reports are 449 or 559, with a few weaker ones. Thanks for writing, Doug. By the way, Doug actually made 16 7.7 wavelength antennas, but could not bring himself to accept the possible consequences of gale force winds if he erected them all!

Closure

Due to space limitations, some information has been held over until next month.

Closing with two thoughts for the month: "Early to bed and early to rise make a man healthy, wealthy and apt to mention it", and "Bureaucracy is based on a willingness either to pass the buck or to spend it". 73 from "The voice by the lake". ar

HOW'S DX

Stephen Pall VK2PS
PO Box 93, Dural 2158

"Is this frequency in use?" Do you remember the "good old days" not so long ago, when people were polite to each other, not only in their everyday lives, but also on radio amateur frequencies? The real truth is that today, contrary to common sense and amateur radio regulations, (See DOC 71/1989, Part 2, paras 26 and 27) there is a lot of intentional interference on the bands, both local and international. If you tune across the 20m band, which is regarded generally as a frequency for distant communications, you hear comments like these: "I was here first", "This is my usual personal frequency", "I am bigger and more powerful than you" "I have to tune up somewhere" (that there is such a thing as a dummy load does not occur to the person saying that), "I do not like you and/or your net", "I do not care about the DX in the background; I want to chat to my friend" (who, incidentally is only 10km away at the other end of town).

The number of amateurs operating on the 20m band is increasing, but the band is not expanding. What happened to the WARC bands? If you want a chat with your friend, why don't you use the 24, 18 and 10MHz bands? It is quiet there; those bands are ideal

for ragchewing, and there is plenty of room for everyone. Please stop and think before you use the bands, and think about the purpose of your planned activity. And remember: being polite does not ruin your reputation!

Bhutan A51

What appeared to be a riddle last month became the plain truth this month: radio amateur jealousy!

Jim VK9NS and Kirsti VK9NL are back on Norfolk Island after an unsuccessful attempt to operate amateur radio from Bhutan. Jim's explanation of the failed mission was published in several DX publications. Here is a short resume of what happened.

Last year, after he spent a considerable time on delicate negotiations with the Bhutanese Ministry of Communications, Jim was granted permission and had a successful operation from that country with the callsign A51JS. One of course has to remember that this was a special permission granted to him, to operate amateur radio in a country where such activity is not allowed for the country's own citizens. Jim's basic desire was to advance the cause of amateur radio in general terms, and to that purpose he did a lot of voluntary work before and during his stay - behind the scenes - in assisting with preparations of the syllabus for future radio operators, with regulations for the future amateur service etc.

When he left Bhutan last year, he donated all the equipment used by him to a future amateur radio club station.

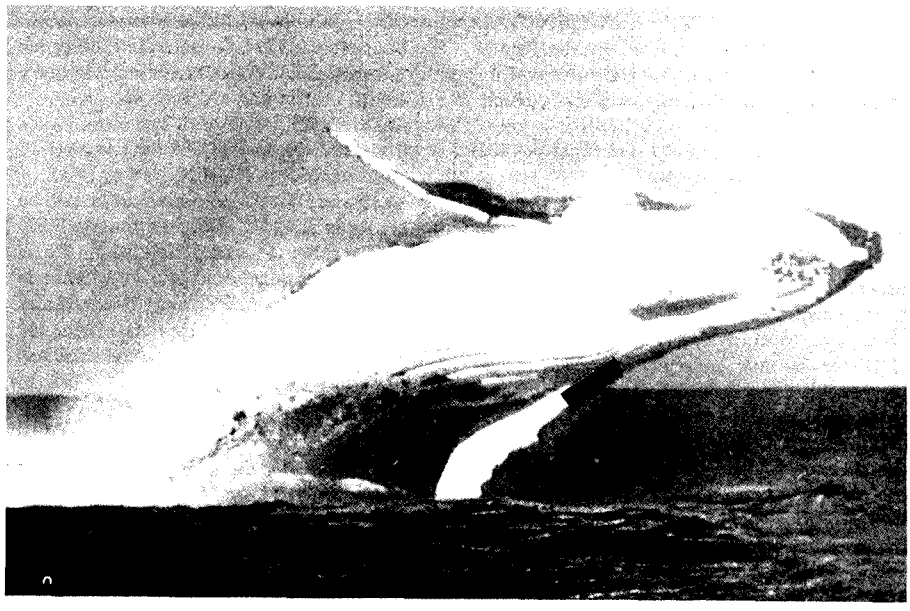
It is now known that, after Jim concluded his visit last year, the Bhutanese Ministry of Communications was bombarded by various foreign radio amateurs, who had no previous negotiations with that Ministry, to grant them permission to operate from Bhutan.

It appears that one particular group (which Jim did not name, for obvious reasons) was very vocal and demanding. The usual stereotype argument was used: "He was given permission; why can't I get one?"

The Bhutanese officials were worried that if they did grant a second permission to Jim and Kirsti to operate it could create such a precedent that they would have faced a more fierce battle second time around with the invading foreign amateurs. So they did what seemed to be the best solution for their country: politely but firmly refused Jim and Kirsti's application.

According to Jim, there is a genuine interest in amateur radio in Bhutan, and things are happening. But it seems to me that the speed of change is dictated by Bhutan's national interest, and not by uncalled and wanted outside pressure by foreign amateurs.

Before departing from Bhutan, Jim had donated all the amateur equipment which he carried to Bhutan, totalling some $4000 in value, in the name of his supporting organisation: HIDXA (Heard Island DX Association) to the Bhutan Amateur Radio Club Station.



A humpback whale in Hervey Bay

South Georgia - VP8SGB

South Georgia is an island group in the south Antarctic Ocean and politically is a dependency of the Falkland Islands. As a DXCC country, it is very much in demand. During the month of May, John became active from Bird Island, one of the islands in the group. The island group is situated at latitude 54°03' South and 36°08' West. John is an Australian and originates from Melbourne, with not much experience in DX QSOs. He is a marine biologist and is attached to the British Antarctic Survey Group and uses, for the time being, the South Georgia Base callsign, but has applied for his own call. John will stay on the island until April 1993. This will give the opportunity to many DXers to work this rare country for their DXCC. John appears on the "226" net (14226.5kHz) at around 9.00-9.30 UTC on Tuesdays. QSL manager is VK4MZ: K Viney, PO Box 381, Gympie, Qld 4570.

The Arctic Regions and EK0KBZ

Max VK2APD has sent me an interesting letter and a beautiful colour QSL card - only to look at - from Serge UA0KBZ, who operates at EK0KBZ attached to the US/USSR Dog Sled Expedition to Wrangel Island in the Arctic.

Serge waited one year for his QSL card to arrive from the printers in Finland. He asks everyone that if they wish to receive any QSL cards from EK0KBZ, 4K4/UA0KBZ or from UA0KBZ they should apply for them now. Send your cards with two IRCs or one "green stamp", no reply envelope, and no callsigns on the outer envelope, to: Serge Tsybizov, PO Box DX 485, Cape Schmidt, Magadan Oblast, 686830 USSR, to arrive before August 1991, as he is moving from the Arctic regions to central Russia, to Voronezh City (UZQ/UA0KBZ). Quote from Serge's letter: "I absolutely haven't possibility to use USSR QSL Bureau because QSL Bureau in practice absolutely not work from our region."

The expedition was sponsored by the Russian "Sputnik" illustrated monthly digest, and is part of the "Big Circle" dog-sled expeditions extending into 1995, to the northern regions of Asia, America and Europe.

Humpback Whales - VI4HBW

The Hervey Bay Amateur Radio Club (PO Box 829, Hervey Bay, Qld 4655) will be activating a special event station with the callsign VI4HBW from 1-31 August. This activity will coincide with the annual Festival of Whales, which celebrates the arrival of the whales into the sheltered waters of Hervey Bay. During the three months, starting from August, these gentle giants of nature rest and rear their young, using the bay's warm waters as their personal playground before they continue their migration south to the Arctic Ocean.

The special event station will be active on the usual DX frequencies on 80, 40, 20, 15 and 10m, and a 24-hour operation is contemplated in the first week of August. A special award and QSL card are planned to commemorate the event.

Ethiopia - ET2A

Jack W4IBB was back again in Ethiopia, on his own, as ET2A. This time he was quite active on both CW and SSB, and this provided a good opportunity to many VK/ZLs to work him. Whilst the political situation gave rise to some concern by others, he was still operating. However, on 28 May, one could feel that the situation became grave as far as Jack was concerned, because he said on the band that he wanted to pass messages to the US. Regula-

tions governing third party traffic prevented him saying what his true situation was. Hopefully he was able to survive the upheaval in Addis Ababa. QSL for the new operation, which started on 8 May, to a new QSL manager, F6HIZ Pierre Essinger, PO Box 67, F-06140, Vence, France.

Tromelin - FR5AI/T

Yoland was very active from Tromelin, generating huge pile-ups wherever he appeared on the various bands.

He started on 5 May and planned to be active for one month, depending on transportation schedules. From VK it was quite difficult to work him, because he was on a working assignment, so he could operate only in his spare time. Taking the time difference into account, the situation was not easy. However, he was quite a good copy in VK on 25 May, on the short path, on 21234kHz, and a number of VKs worked him. There is some confusion about his QSL address as given over the air, but this is how it appears in the International Callbook: Yoland Hoarau, 4eme Km St Francois, F-97400, Saint Dennis, Reunion Island via France. Please remember: no callsigns on envelopes, and use only IRCs as return postage.

Malyj Vysotskij Islands - 4J1FS

The islands, which create pronunciation problems for English speaking amateurs, came on the bands as per schedule. It was a short operation lasting only five days, including the WPX (World Prefix) CW contest. Activity was on all bands, including the WARC bands. They had a booming signal to VK on 24 May on 14MHz. QSL to: OH2BU Jari Jussila, Pilvijarvi, SF-02400, Kirkkonummi, Finland.

Angola - D2ACA

After many weeks of waiting, the Russian DXpedition comprising five Russian amateurs became active in Angola. This operation was also of short duration, lasting only two weeks. Activity was on both CW and SSB. QSL to LZ2DF.

Myanmar (Burma) - XZ

According to fax messages received by various DX outlets, Romeo has received his licence for XS, and he sent it to the DXCC for approval. The group intends to operate from one of the Myanmar islands. According to Romeo it will be a costly expedition, in the vicinity of $US45,000.

Future DX Activity

* PA0CRA is planning to visit Fiji, with possible trips to Rotuma, Wallis and Futuna, Naura and Tarawa in the first two weeks of July.
* SV8/DF3IS will be active from Corfu Island from 20 July to 1 August.
* EA3CUU will operate from Pagalu Island (formerly Annobon) from 4-14 August, and will use the call 3C0CW.
* Laurent FT4YD is quite active in French Antarctica and will be there until January 1992.
* Mike KN4UL expects to be on the bands from Malawi as 7Q7MM for the next 18 months. QSL to N4RFN.
* Wolfgang DK4UW told me that he will be active as HK0/DK4UW in January 1993.
* Yet another Pacific DXpedition. Carlo I4ALU leaves Italy on 14 July and intends to be active only in CW, from 3D2, A35 and ZK1 (South). He may visit other islands.
* Terje LA3EX hopes to be on the bands as JX3EX for about six months. QSL to LA5NM.
* John TR8JWH is in Gabon for a 12-month period.
* According to various DX sources, St Paul Island will be active from 1-7 August as CY9CWI.
* 4K1A is in Antarctica and expects to be there until 1992. The operator is Nick UZ1PWA.

Interesting QSOs and QSL Information

Note: Callsign, Name, Frequency, Mode, UTC, Month of QSO.

OY1CT-Carsten-14001-CW-0500-May-QSL to: Carsten Thomsen, FR-340, Kvivik, Farce Islands, North Atlantic.

CM2VS-Juan-21006-CW-0530-QSL to: I0WDX Cesare Casaroli, Piazza Conti 2 I-00010 Poli, Italy.

4K4/UA0KW-21018-CW-0600-QSL to: UA0KCL.

9X5HG-Hartmut-21034-0630-QSL to: Hartmut Gumpert, BP420 Kigali, Rwanda, Africa.

W5RRR-Karen-28MHz-0027-SSB-QTH: Lyndon B Johnson Space Centre, during shuttle flight STS-37. QSL to: NASA, Johnston Space Centre, Houston, Texas, USA 77058.

HP8ADU-Carlos-21MHz-SSB-0743-QSL to: Carlos Aguilar, Grobe Apt 13, Martin, TN-38237 USA.

XW8KPL-Phuthong-21MHz-SSB-1244-QSL to: Box 3770, Vientiane, Laos.

FT4WC-14027-CW-1340-May—QSL to: F6BVH Michel Godefert, BCAC, Courriers Exterieurs, 14 Rue Saint Dominique, F-75997 Paris, Armees, Franc.e

TL8MB-28474-SSB-0928-QSL to: F6FNU M Antoine Baldeck, Box 14, F-91291, Arpajon, Cedex, France.

5H5HH-Henry-14222-SSB-0623-May-QSL to: Henry Hourton, Box 1172, Nouakchott Mauritania, Africa.

J79MD-George-14165-SSB-1100-June-QSL to: N4CRU Frances T Sledge, 3004 Oakley Hall Road, Portsmouth, VA 23703 USA.

S79KMB-Keith-21205-SSB-0445-May-QSL to: KN2N Anita M Keighley, 4801 Warwick Way, Alexandria, LA 71303 USA.

OD5ET-Joe-21205-SSB-0449-May-QSL via Bureau or PO Box 55290, Beirut, Lebanon.YI1BGD-14243-SSB-0645-May-QSL to: Box 7361, Baghdad, Iraq.

C3URA-Fred-14151-SSB-0614-May-QSL to: URA, PO Box 150, Andorra, Europe.

Y88POL-Walter-14226-SSB-1120-May-QSL to: Y32WN Siegfried Gedel, Box 21, Mittweida, 9250 Germany.

4U6ITU-WOlfgang-1422-SSB-0745-17 May-QSL to: DF4UW Wolfgang Guenther, Maxmillian Str, 77, D-7570, Baden-Baden, Germany.

V31SW-Scotty-21295-SSB-0540-May-QSL to: Scott T Williams, PO Box 1522, Belize City, Belize, Central America.

CN8CH-Ismail-21205-SSB-0528-May-QSL to: Box 3055, Tanger, Morocco.

FT4YD-Laurent-14165-SSB-1148-May-QSL to: FD1NZO, Box 1, Vitry-Sur-Loire, France, F-71140.

* T95ITU-14072 at 0002Z, FEC, QSL to: FB5MUX.
* HP1DZO-21083 at 2108Z. QSL to: Box 842, APO, Miami, FLA 34004 USA.
* FM5DN-14092 at 0350Z. QSL to: N3ADL.
* XF3AFU-21089 at 1945Z. QSL to: Box 642, Cancun, CP 77500, Mexico.
* 6W6JX-14086-at 2010Z. QSL to: Box 200, Kaolack, Senegal, Africa.
* EM2C-14087 at 0100Z. QSL to: Box 80, Minsk 83, 220083 USSR.
* TA8C-21084 at 1815Z. QSL to: Box 13 Gaziantep, Turkey.
* YS70B-2084 at 2303Z. QSL to: Mario Batres, Calle Barios 14, Ahuchtan, El Salvador.
* A61AD-21092 at 2130Z. QSL to: WB2DND.
* SI4SM-14088 at 1118Z. QSL to: SK4BX.

From Here and There and Everywhere

* The net controller of the ANZA Net (21205kHz) Percy VK4CPA (see article in Sept 1990 issue of *AR*) had to spend some time in hospital to have a pacemaker fitted to regulate his own personal "oscillator": his heart. We wish Percy a speedy recovery and continued good health.
* Bing VK2BCH of Rotuma (3D2XV) fame, moved in June to Pt Vila, Vanuatu and commenced operations with the callsign YJ0AXV.
* Father Marshall Moran 9N1MM, the well-known amateur of Kathmandu, was 85 years old on 29 May. He is still active on the bands, and expects to visit the US in October this year.
* EG8CAC was a special event station for 48 hours duration, to celebrate Canary Island Day. QSL to EA8ZX.
* AX2ITU was operated by the VK2 Division of the WIA, celebrating the 126th anniversary of the International Telecommunication Union (ITU) a United Nations

affiliated organisation which, among other things, regulates the International Radio Frequency Program worldwide. ITU had its origins in the International Telegraph Convention held in Paris in 1865 which agreed on basic telegraph regulations.

* Joe OD5ET was booming in on the long path on 21MHz. Joe is on generator power supply, which limits his activities. He says that the Lebanon QSL Bureau is functioning again.
* C3URA was a special event station operated by the Andorrean Radio Amateur Society, celebrating the mini-olympics of the eight small European nations.
* The St Peter and Paul Rock DXpedition used two callsigns. PY0SK (QSL to PS7KM) (see June *AR* for QSL address) and PY0SR (QSL to Jaime Dorneles, Rua Alfonso Penna 554, Estreito, 88070, Florianopolas, SC Brazil).
  Please include two IRCs or two "green stamps" with your reply envelope. Brazil now charges the equivalent of US$1.46 for overseas airmail.
* If you hear George W2NHZ from NJ on the band, give him a call. George collects VK QSOs. When I spoke to him on 28 May, I was his 982nd VK QSO.
* If you contacted II0ONU, it was an UNICEF special event station, and QSL goes to I5KKW via the Bureau.
* WO0G and AG9A were active from Belau, Western Carolinas, as KC6XX and KC6KW. QSL to their home call.
* Amateurs on Cayman Islands - ZF - are now allowed to use the WARC bands.
* Rumour has it that Ron ZL1AMO might go to Kermadec ZL8. He is now trying to organise transport to the islands.
* Another rumour heard on the band is that there will be a Glorioso Island activity in June or September.
* The YA0RR QSL cards are back from the printers, and the lucky ones who worked them can expect their cards soon.
* Another rumour: Some well-placed DXers said that North Korea will soon become a new DX country and the first activity will be by P5YL. Well, let's wait ... and see.
* Expect more activity from FP - St Pierre and Miquelon Island group. According to various DX outlets, there are now six candidates studying to pass the French amateur examinations.
* Do you need a QSL card for the May 1990 Yemen 701AA operation? Please QSL direct with the usual SAE and return postage (two IRCs) to DL2BCH, Gabriele Graeter, Bachstr 8, D-2907 Grosenkneten, Germany.
* Jim VK9NS has obtained a USA permanent extra class licence, WR1Z.
* Beiaiti T30DP has a new postal address: Send your cards to Beiaiti Highland, PO Box 473, Betio, Tarawa, Republic of Kiribati.
* Antoine 3D2AG, who is a resident amateur of Fiji, will spend the first three weeks of July on Rotuma Island. As Rotuma is part of the Fiji Republic, he will use his own callsign, but will have a special QSL card printed for this occasion. He plans to be active mostly on CW, which will be much appreciated by those who need a CW contact with that DXCC country.

QSLs Received

Note: W=week, M=months, YRS=years, FM=from, MGR=manager and his call, OP=operator and/or callsign.

Direct cards:

XQ0X 912 W FM MGR CE3ESS), TJ1YL (6 W FM MGR FRENCH DX FOUNDATION) ET2A (7W FM MGR WA2NHA), KD7P/NH7 (3W FM OP KD7P/KH2), FP/KH21 (7W FM OP JK1KRS), ST0DX (7W FM MGR WA2NHA), 3DA0BX (7W FM OP).

Thank You

A big thank-you to all my supporters for their assistance, but especially many thanks to: VK2APD, VK2SG, VK3DD, VK3JI, VK4CPA, VK4DA, VK4JWW, VK4OH, VK4MZ, VK6PY, VK9NS, 3D2XV and the following publications, *QRZ DX, The DX Bulletin, DX News Sheet*

Good DX and 73 ar

POUNDING BRASS

Gilbert Griffith VK3CQ
7 Church St Bright 3741

More on Learning to Communicate

Most confirmed morsiacs will be aware of the many advantages of the CW mode. What are the advantages of Morse? As well as its effectiveness, the narrow bandwidth of Morse uses the radio spectrum most efficiently, allowing parallel contacts to take place within a small spectrum space. This is a great advantage in crowded band conditions. Morse is a truly international language which enables two-way communication between amateurs who would otherwise be unable to understand each other. Also, Morse needs only very simple transmitters and receivers, in contrast to the increasing complexity of equipment using other modes. So, through Morse, youngsters and others with limited resources can enjoy and learn about radio communication. Other advantages include the ability to transmit intelligence through bad conditions, using lower power, than typical voice modes. You can think of many other advantages yourself, and perhaps a survey of them could be conducted with the aim of deciding which are the most important.

To employ these advantages requires a certain amount of self-training and dedication in order to acquire unique skills. Those of you who have been following the guidelines set out in my May column will be aware of the work involved, and should have acquired many skills already. Regrettably, there are many people today who would rather spend their time and effort in trying to change the rules, not realising that the constructive effort of learning will reap more benefit than any they would get from a "cornflake packet" licence.

Well, just how are you going? With two months of operating, most beginners will have no trouble now with initiating a contact, and should be more than proficient at a simple "standard" contact. You should also be able to handle a longer conversation-style of QSO, making only occasional notes. You CAN'T? If not, I'm afraid you haven't been practising, which explains why I've heard so few on air in the evenings; or is everyone practising in the daytime?

Really, two months is only enough to scratch the surface; it takes me that long to read the rig manual. Or at least to understand it. But by now you should at least know how to run full break-in on your own rig, even if you haven't tried it as yet. It pays to experiment with different settings, and if you can stick with a regular friend who you can contact any time on air, the two of you can experiment together without the need to learn a new operator's habits each time. I had one particular friend on air, who I could call up every evening to have a chat, and then could try out antennas, keys, keyers and even rigs on him, knowing that he would understand what I was doing and respond appropriately.

Remember the most important three rules: 1. The right frequency. 2. Listen, and 3. Think before you send. Getting the frequency right will involve learning all you can about your equipment, and then practising enough so that you have confidence in your ability. Listening is the main point of the so-called "standard procedures" and "gentlemen's agreements", when you decide what power and speed to use with the conditions at the time. Even the more experienced operators could do with a little practice in this area, with special regard to the speed in use by those on the frequency.

There is little point in barging in on a station which is working a dogpile of DX, if you want to have a long chat. If you do, you will be disappointed. Conversely, breaking in on a two-way conversation is not polite, if you are chasing contacts in a contest. (Even if it is a good way to get two points!). Use common sense before you transmit. There are so many no-nos that it is impossible for me to list them all; but my pet peeve used to be a regular

occurrence while contesting. I would be contacted by a really slow operator who did not realise there was a contest on at the time, who did not know how to give "numbers", who wanted a chat, and who wouldn't leave the frequency! I would like to make a list of peeves, so feel free to write down yours and send them to me. I am sure everyone would like to compare notes and have a good laugh, and newcomers would see some of the pitfalls rather than experience them first-hand.

By following standard procedures well, you can take pride in the fact that the people listening will be learning from you. Other operators will enjoy talking to you, and you will make many more enjoyable contacts. Don't be shy in giving praise to others whose style you admire. They may be fast and accurate, or easy to copy; if you like their Morse, say so. Conversely, if someone is off in frequency, or too fast for you, they will appreciate it if you tell them. It is not much good pretending you can copy bad spacing; be polite, but tell them to slow down. That's QRS not QRN. There are Q codes for some, and old (but good) Z codes for others.

QRG Your exact frequency is . . . . kHz
QRH Your frequency varies
QRI Your note varies
QRK The intelligibility of your signals is (1 to 5)
QSW?Will you send on . . . kHz or MHz?
ZCK Check your keying
ZCL Transmit your call letters intelligibly
ZDM Your dots are missing
ZSU Your signals are unreadable

Here are a few quick guidelines; practise them as much as you can.

Don't send "R" if you didn't copy or read the whole over.

It is only required to identify every 10 minutes; merely send "de VK3CQ" as appropriate at the start or end of an over when you notice that 10 minutes has elapsed.

It is certainly not necessary to send BOTH callsigns at the start and finish of every over.

If you are rag-chewing and wish to over, merely send a full-stop and a "K".

If you are on a net, send the next station's callsign, followed by your own.

You should have a list of stations in their order in the net.

Experiment as much as you can; try lowering the power output as you send, and ask for a report of the results.

Make your goodbyes short and sweet.

Feedback Required

Send me a list of what you think are the advantages of Morse over other modes, in their order of importance.

Send me another list of the things that annoy you on air, arranging the list so that the most annoying is on top and the least annoying on the bottom.

It might help if you mark the level on your list where you swear, switch off, or smash your rig to bits.

You can send packet messages to me VK3CQ @ VK3EEE or by mail QTHR. ar

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. All of the items given below are available in the Executive Office Library. As a special service to **Members Only**, a photocopy of any complete article is available for $2.50 posted. To circumvent any copyright problems, please be sure to state - 'The information is required for the purpose of private study'. Address your request to 'The Librarian, Executive Office WIA, PO Box 300, Caulfield South Vic, 3162.'

Amplifiers

Microwave

A Simple and Inexpensive 23/24-Centimeter Signal Combiner. Chip Angle N6CA, QST vol LXXV No 4 April 1991 pp 28 - 30. il cct, diags and photos. A 1.5λ circumference ring acts as a hybrid splitter and combiner, enabling a single source to be split into two amplifiers and subsequently combined to give 3dB gain over a simple amplifier. Both sum and difference outputs are available to simplify adjustment. Six rings and four amplifiers can give a 6dB improvement over a single amplifier.

Small Signal

The basic Transistor Amplifier. Peter Phillips, EA vol 52 No 5 May 1991 pp 100 - 103. il ccts. An educational dissertation containing information necessary to design voltage amplifiers.

Antennas

Magnetic

A Magnetic Loop Antenna for the Low Bands. Roberto Craighero I1ARZ, RadCom vol 67 No 2 Feb 1991 pp 38 - 40. il cct and diags. A 2.5m square rotatable loop is described, constructed of copper tubing. A motor driven vacuum capacitor is used for loop tuning. Energy is inductively coupled into the loop via a coaxial cable bent into a circle. Adjustment procedure is described for obtaining a low SWR in the 50 ohm coaxial feeder. Good results are claimed for 40, 80 and 160m.

Advanced Electronic Applications IsoLoop 14 to 30 MHz Antenna. (Product Review) Doug DeMaw W1FB, QST vol LXXV No 4 April 1991 pp 45 - 46. il photo. An evaluation of this 32" square antenna, including measurements, is presented. It is tuned by a large capacitor located opposite to the coaxial feed point. A stepping motor rotates the capacitor shaft.

Miscellaneous

10 dB on 10 Metres - for Nothing (1). William Skidmore VE3AUI, QSTVE May 1991 pp 3 - 4. il diag. Introduction to a two part article, which deals with the technology of collinear arrays as a preliminary to discussion of Sterba arrays.

The TFH (Top Fed Helical) Antenna. Richard Q Marris G2BZQ, Radcom vol 64 No 4 April 1991 pp 46 - 47. il ccts and diag. A description of a multiband helical antenna 2m long, used vertically and fed at the top with a 10 foot single wire. The use of an ATU is mandatory, and a suitable design is presented. The antenna is usable over the whole of the 80, 40 and 20m bands. The author recommends that the power output should not exceed 25W.

Product Reviews

Butternut HF6V-X Multiband Vertical Antenna. Peter Hart G3SJX, RadCom vol 67 No 3 March 1991 pp 66 - 68. il cct and photos. A detailed description, including theory, of this antenna. A report is included on its performance from three different sites.

VHF/UHF

A Glass-Mounted 2-Meter Mobile Antenna. Bill English N6TIW, QST vol LXXV No 4 April 1991 pp 31 - 34. il cct, diags, graph and photo. The dielectric properties of the windscreen or rear window may be exploited to couple to a mobile antenna, without drilling holes. Brass plates, attached with adhesive, act as capacitor plates. The capacitance introduced, including any from a shortened antenna, may be compensated by lumped inductance. Alternatively, the antenna can be made slightly longer to compensate. In either event, trimming the antenna achieves a satisfactory SWR.

Yagi

Rutland Arrays FO-22 And FO-25 432 MHz Yagi Antennas. (Product Review) Mark Wilson AA2Z and Rus Healy NJ2L, QST vol LXXV No 4 April 1991. An evaluation, with measurements, of these two antennas.

Computers

Hardware

Upgraded RAM-DACs Give Enhanced VGA Graphics. Bill Schweber, EA vol 52 No 5 May 1991 pp 122 - 125. il diags and photos. An application note by Analog Devices describing the use of ADV7141, ADV7146 and ADV7148 RAM-DACs. These monolithic ICs are claimed to greatly enhance the resolution, colour rendition and line quality of industry standard VGA displays.

Logic Analysers

The Logic Analyser. J L Elkhorne, EA vol 52 No 5 May 1991 pp 126 - 128. il photos. A general discussion on the advantages of a logic analyser for troubleshooting microprocessor based equipment.

Software

'Serialtest' - analyse serial data on your PC. - Product Review - Rob Evans, EA vol 52 No 5 May 1991 pp 116 -119. il photos. An application review of a software package available from Advanced Computer Consulting Inc (ACCI). System converts an IBM compatible into a serial data anaylser. The package, including diskettes, manual and special RS-232 cabling is priced at Aust$475.

Filters

A Simple Audio Notch Filter. Dr Paul Stewart G3AEH, RadCom vol 67 No 1 Jan 1991 pp 38 - 39, 59. il ccts, cmp and graphs. A design for a notch/bandpass switched capacitor filter, using National Semiconductor LMF90 IC. Centre frequency is adjusted via VCO 74LS629N; bandwidth is switchable in three ranges. The use of switched capacitor technology ensures good frequency stability with temperature.

Packet

Getting Started in Packet Radio. Clive Smith G4FZH. RadCom vol 67 No 2 Feb 1991 pp 48 - 49. . A Simple introduction to the concepts of packet radio. A description os the equipment necessary is given.

Propagation

Predictions

Midrange Forecasts of Solar and Geomagnetic Activity. Emil Pocock W3EP, and Byron Blake N8LSQ, QST vol LXXV No 4 April 1991 pp 22 - 27, 30. il graphs. A general discussion which highlights the superiority of 30 day forecasts over those of longer prediction. Data analysis procedures are given; this technique is applied to actual test data, and shows the improved accuracy of short-term predictions.

Receivers

Accessories

Variable-tapped balun for HF receivers. Tom Moffat VK7TM, EA vol 52 No 5 May 1991 pp 82-85. il cct and photos. A design for a switched HF transformer to match a dipole with balanced line to a receiver with coaxial input.

Home Brew

The OZ1HWO 144-148 MHz Pocket FM Receiver. Morten Tolstrup OZ1HWO, QEX vol 110 April 1991 pp 7 - 12. il cct, cmps, diags, pcbs and photos. A double conversion superheterodyne based on Motorola MC3362 IC. Complete construction details are given. The receiver operates from 2 - 7V, and draws 4mA. The sensitivity for 20 dB SINAD is 0.7 µV.

Miscellaneous

Improving Direct Conversion Receiver Design. Nic Hamilton G4TXG, RadCom vol 67 No 4 April 1991 pp 39 - 44. il ccts and graph. A general discussion on the problems encountered with the practical realization of DC receivers, and the precautions necessary to achieve satisfactory results.

Satellites

Packet

Automated SAREX Communication. Eric L Smitt K9ES, QEX vol 110 April 1991 pp 3 - 6. A description of the application of InstantTrack and Kansas City Tracker/Tuner to the prediction and automatic tracking of SAREX, or any other orbiting body. The application of ProCOMM for control of packet communication is also described. It is claimed that slight modification of TNC parameters increases the chances of a connect under busy conditions.

Technology

An Introduction to Meteor Scatter Operation. Nigel Wilson G4VVZ, RadCom vol 67 No 1 1991 pp 46 - 47. il diags and graphs. The concluding section of a two part article. A general discussion about the techniques necessary for this mode.

Connectors for (Almost) All Occasions - Part 1. David Newkirk WJ1Z, QST vol LXXV No 4 April 1991 pp 35 - 38. il diags and photos. Techniques are given to produce successful results when wiring phone and phono connectors. A simple wiring jig made from clothes pins (pegs) is described.

ESD - Electrostatic Discharge - Part 1. Bryan P Bergeron NU1N, QST Vol LXXV No 4 April 1991 pp 19 - 21. il photos. A general discussion on the mechanism and prevention of ESD damage to semi-conductors. Humidifiers, grounded wrist straps and work mats are recommended as possible solutions, together with anti-static containers and the use of grounded soldering irons. An air ionizer is also suggested to remove static charges from tools and insulators.

How to Lay Out RF Circuits (1). Ian White G3SEK, RadCom vol 67 No 2 Feb 1991 pp 36 - 37. il cct and cmp. An elementary treatment (first of two parts) on how to plan the layout of RF circuits so that the prospect of working first time is enhanced.

How to Lay Out RF Circuits (2). Ian White G3SEK, RadCom vol 67 No 3 March 1991 pp 60 - 61. il diags. Concluding part of article which describes the practicalities of constructing RF circuits. Both 'wired tracks' and 'pin-and-wire' techniques are discussed. Consideration is also given to surface mounting.

Test Equipment

Miscellaneous

A Buzzer Noise Source...and How to Use it. David Sumner G3PVH, RadCom vol 67 No 1 Jan 1991 p 37. il ct and diags. A relay, energized by one of its normally closed contacts, acts as a buzzer producing wide spectrum noise. A coupled tuned circuit may be used to enhance a specific frequency.

Simple CRO Adapter tests solid state devices. Ben Takach, EA vol 52 No 5 May 1991 pp 68 - 71. il cct, diags and photos. Lissajous figures are generated by a device which produces two 50 Hz AC signals differing in phase by 90°. The two quadrature voltages are applied simultaneously to the vertical and horizontal deflection amplifiers of a CRO, and to the anodes/cathodes, drains/sources or collectors/emitters of the active devices under test. The gates or bases are connected to earth. Modified Lissajous figures, uniquely characteristic for the particular devices, are obtained.

Charts for correct patterns are given, together for those for particular fault conditions. It is possible to use the device to determine the pin connections for any two, three or four terminal semiconductor device.

Probes

Low cost dual mode Logic Pulser probe. Rex Callaghan and Jim Rowe, EA vol 52 No 5 May 1991 pp 62 - 66. il cct, cmp and photos. A logic probe which forces a TTL or CMOS gate into the opposite state temporarily so that the transition may be observed by a normal logic probe. Developed by Dick Smith Electronics, a complete kit is available for $24.95.

Product Reviews

H-P's New 54601A 100 MHz Digital Scope. Jim Rowe, EA Vol 52 No 5 May 1991 pp 88 - 92, 107. il graphs and photos. A detailed review of this new product.

Glossary of abbreviations

il	The article contains illustrations, a list of which follows.
cct	A circuit diagram
cmp	A component layout drawing
EA	*Electronics Australia*
diag	A mechanical drawing
pcb	A master drawing from which printed circuits may be produced
QSTVE	*QST Canada*
RadCom	*Radio Communication*
73	*73 Amateur Radio Today*

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ar

AMSAT

Maurie Hooper VK5EA
11 Richland Road Newton 5074
Packet: VK5EA@VK5WI

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information Nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC

Sunday Bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz
(7.064MHz is the frequency presently in use)
AMSAT SW PACIFIC 2200 UTC Saturday, 14.282MHz
Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 320 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia, addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a Software Service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services, send a SASE to Graham.

2-Line Orbital Elements 145.AMSAT May 25, 1991

```
DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00   0   0 BBBBB.BBBBBBBB  .CCCCCCCC  00000-0  00000-0 0  DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83 58   B 91138.10904151 -.00000109  00000-0  99998-4 0  6743
2 14129  25.8164 145.1928 6022329 242.7457  44.6724  2.05885438 31622
UO-11
1 14781U 84 21   B 91141.07798147  .00002281  00000-0  41590-3 0   171
2 14781  97.9002 186.9070 0011077 254.4127 105.5848 14.66921087385474
RS-10/11
1 18129U 87 54   A 91141.88184788  .00000090  00000-0  92593-4 0  6531
2 18129  82.9262  78.2958 0010259 259.4239 100.5736 13.72187225195984
AO-13
1 19216U 88 51   B 91121.30113593  .00000118  00000-0  99999-4 0  2712
2 19216  56.8390  97.0967 7167973 253.2812  22.8340  2.09698033 22040
FO-20
1 20480U 90 13   C 91129.94007955  .00000032  00000-0  12036-3 0  2216
2 20480  99.0269 119.3631 0541409  28.2030 334.7299 12.83179903 58657
AO-21
1 21087U          91141.31033519  .00000153  00000-0  14952-3 0   814
2 21087  82.9401 253.6036 0035336 336.3950  23.5581 13.74382818 15339
RS-12/13
1 21089U 91   7   A 91137.90824027  .00000163  00000-0  16217-3 0   812
2 21089  82.9228 126.5540 0030267   6.7432 353.4126 13.73897721 13989
UO-14
1 20437U 90   5   B 91139.72759653  .00000705  00000-0  29353-3 0  3864
2 20437  98.6663 219.3509 0010544 251.9463 108.0536 14.29118862 68929
AO-16
1 20439U 90   5   D 91140.74452842  .00000605  00000-0  25387-3 0  2850
2 20439  98.6717 220.6798 0010316 251.7012 108.3047 14.29205434 69070
DO-17
1 20440U 90   5   E 91137.15617569  .00000715  00000-0  29680-3 0  2832
2 20440  98.6732 217.1507 0010401 262.7018  97.2990 14.29285003 68567
WO-18
1 20441U 90   5   F 91135.23712563  .00000616  00000-0  25769-3 0  2812
2 20441  98.6714 215.2902 0011051 266.9323  93.0595 14.29328365 68297
LO-19
1 20442U 90   5   G 91135.98331718  .00000625  00000-0  26126-3 0  2823
2 20442  98.6713 216.0881 0011268 263.3478  96.6432 14.29405884 68408
NOAA-9
1 15427U 84123   A 91141.30073129  .00000518  00000-0  29856-3 0  7825
2 15427  99.1698 154.1723 0015804 137.3265 222.9137 14.13005072331726
NOAA-10
1 16969U 86 73   A 91136.08819367  .00000740  00000-0  33786-3 0  6300
2 16969  98.5676 161.1067 0014103  25.5480 334.6393 14.24123638241988
MET-2/17
1 18820U 88   5   A 91137.89759054  .00000206  00000-0  17520-3 0  5307
2 18820  82.5401  84.3716 0017994 101.0913 259.2270 13.84482110166490
MET-3/2
1 19336U 88 64   A 91137.78672765  .00000030  00000-0  65848-4 0  7825
2 19336  82.5442  40.7028 0016359 193.9909 166.0762 13.16923284134997
NOAA-11
1 19531U 88 89   A 91137.10306663  .00000644  00000-0  37179-3 0  5336
2 19531  99.0283  91.6596 0013144  65.6984 294.5549 14.12141722136080
MET-2/18
1 19851U 89 18   A 91137.88451758  .00000177  00000-0  14939-3 0  4828
2 19851  82.5219 321.7745 0014644 140.8984 219.3237 13.84133340111869
MET-3/3
1 20305U 89 86   A 91141.03605711  .00000043  00000-0  99999-4 0  3811
2 20305  82.5583 339.7140 0015536 204.0883 155.9519 13.15954785 75381
MET-2/19
1 20670U 90 57   A 91137.68861796  .00000328  00000-0  28517-3 0  2327
2 20670  82.5488  23.1340 0017592  68.9603 291.3435 13.83971347 44787
FY-1/2
1 20788U 90 81   A 91140.58514668  .00000324  00000-0  23866-3 0  1934
2 20788  98.9463 174.6896 0014442 255.3653 104.5910 14.01153837 36340
MET-2/20
1 20826U 90 86   A 91137.91033408  .00000163  00000-0  13949-3 0  1834
2 20826  82.5278 321.9797 0012985 331.3946  28.6495 13.83344374 32025
MET-3/4
1 21232U 91 30   A 91137.77428073  .00000005  00000-0  00000 0 0   223
2 21232  82.5456 245.9829 0017183 126.9351 233.3350 13.15983814  3126
NOAA-12
1 21263U 91 32   A 91140.76038009 -.00000029  00000-0 -48199-5 0   155
2 21263  98.7352 170.3864 0012304 244.5373 115.4525 14.21383733   869
MIR
1 16609U 86 17   A 91141.80322258  .00025579  00000-0  24597-3 0  4825
2 16609  51.6044  61.0485 0005220 198.7546 161.3179 15.66382168301038
HUBBLE
1 20580U          91141.46086867  .00005280  00000-0  55111-3 0  4734
2 20580  28.4714 253.2025 0005565  43.1901 316.9107 14.87708646 58338
```

UOSAT-F Launch Delay

(From AMSAT News Service Bulletin 145.03 from AMSAT HQ, 25 May 1991)

UOSAT has received word that the Ariane V44 launch with UoSAT-F and ORBCOM-X will be delayed for at least several weeks. The following is excerpted from the notification.

"After analysis of recent third stage motor test and flight data Airanespace, along with CNES and SEP, has concluded that a modification should be implemented in order to improve the operating margins of the motor by suppressing an undesirable transient in the H2 feed line during the start-up phase. This transient has been aggravated due to some dispersion in the manufacturing process and has been consequently noted on several past flights.

"The modification involves the introduction of an LH2 pump discharge system downstream of the main H2 feed valve. For this modification, a qualification test program is required and has, in fact, already been initiated; the first results are positive. The test schedule and schedule for hardware modifications to the V44 third stage on the pad would allow a launch of flight V44 in July 1991.

"The V44 payload composite with the ERS-1 and the four microsatellites will be taken off the launch vehicle and transported to S3B. The fairing will be de-mated and ERS-1 reconditioned to be ready for an early July launch."

Mir News

This is the latest news (19 April '91) from Musa U2MIR and Victor U9MIR on Soviet Space Station Mir:

The closer our landing, the more work there is. We are now changing blocks of apparatus

and are installing new ones in my "radio shack", so now the room is a shocking mess. I have almost stopped working ham radio. My ham radio gear is installed in the 'Kvant' module - the astrophysical one. Here is a sketch of our space station: (See next page)

This month we have to go out twice on space walks (EVA).

Our task is to transfer two drives for the solar batteries from module E to module C. The last time we went out we installed special bearings (supports) on module C. The work is rather difficult. For transferring the drives we use a special cargo (load) Shaft G. It is telescopic like some antennas.

Now, about a few rumours:

- We always have a stock of food to last several months, so hunger never threatened us. (And I have remained stout and handsome).
- If the Progress cargo ship had not arrived, there would not be new equipment for subsequent experiments. However, there is still enough food, water, O2, forks and knives.
- About a possible collision: Progress lost radio contact with the station and missed the docking unit. But, for these events, we have some automatic control in the Progress on-board computer to put the cargo ship right back. In addition, at the moment of docking, the crew must be inside the space ship with the hatch closed.

You see, it was not so dangerous.

We succeeded only in exchanging callsigns with STS-37. They had a damaged antenna.

73 ... Musa U2MIR

U2MIR DE-ORBITS

(From AMSAT News Service Bulletin 145.02 from AMSAT HQ, 25 May 1991)

Musa, U2MIR, Bids Earthbound Amateurs Farewell

On USA passes during the afternoon and evening of Friday 24 May 1991, the following came down from the amateur radio packet station on MIR:

U5MIR>CQ:FROM 24.05.91 YOU CAN CONNECT WITH U5MIR, PMS: U5MIR-1. U2MIR SENDS HIS BEST 73s TO ALL!!!

U5MIR is the callsign of one of the cosmonauts on the new crew which just arrived last week.

In a packet QSO with students in Australia, Musa indicated that he is not sure whether he wants to go up to MIR again. He has personally logged a year and six months in space (a record) and has been on seven space walks, one for six hours. He is in his early 40s, and with a wife and two children who would probably not mind him being earthbound now! Perhaps he will be heard on the ham bands from a terrestrial QTH in the not-too-distant future.

Change to AMSAT Keplerian Sets

(From AMSAT News Service Bulletin 145.06 from AMSAT HQ, 25 May 1991)

Checksum Feature Added to AMSAT Keplerian Element Sets

As a way of improving distribution of orbital elements, and enhancing the service to AMSAT members, a new feature has been implemented, effective 25 May 1991.

After months of discussion and review with tracking software authors and users, Dick Campbell N3FKV, the AMSAT Orbital Data Manager has published the AMSAT Keplerian Element Set Standard. This document is the explicit definition for the creation of AMSAT format element sets, and should therefore be

New AO-16 Telemetry Equations

HR AMSAT News Service Bulletin 145.07 from AMSAT HQ
Silver Spring, MD 25 May 1991
To All Radio Amateurs BT

The AO-16 command team has revised the telemetry coefficients for Pacsat. Users of TLMDC and TLMDC-II will want to update their PACSAT data files accordingly. The equations which have been updated are for channels Ox1F, Ox20, Ox21, Ox2D and Ox2E.

New AO-16 Telemetry Equations:

NEW AO-16 TELEMETRY EQUATIONS

HR AMSAT NEWS SERVICE BULLETIN 145.07 FROM AMSAT HQ
SILVER SPRING, MD MAY 25, 1991
TO ALL RADIO AMATEURS BT

The AO-16 command team has revised the telemetry coefficients for Pacsat. Users of TLMDC and TLMDC-II will want to update their PACSAT data files accordingly. The equations which have been updated are for channels Ox1F, Ox20, Ox21, Ox20, and Ox2E.

New AO-16 Telemetry Equations:

0	Rx D DISC:	+9.202	-0.08990	0.000	kHz	
1	Rx D S meter:	+0.000	+1.000	0.000	Counts	
2	Rx C DISC:	+9.179	-0.09277	0.000	kHz	
3	Rx C S meter:	+0.000	+1.000	0.000	Counts	
4	Rx B DISC:	+9.837	-0.08838	0.000	kHz	
5	Rx B S meter:	+0.000	+1.000	0.000	Counts	
6	Rx A DISC:	+9.779	-0.09144	0.000	kHz	
7	Rx A S meter:	+0.000	+1.000	0.000	Counts	
8	Rx E/F DISC:	+10.817	-0.09911	0.000	kHz	
9	Rx E/F S meter:	+0.000	+1.000	0.000	Counts	
A	+5 Volt Bus:	+0.000	+0.0305	0.000	Volts	
B	+5V Rx Current:	+0.000	+0.000250	0.000	Amps	
C	+2.5V VREF:	+0.000	+0.0108	0.000	Volts	
D	+8.5V Bus:	+0.000	+0.0391	0.000	Volts	
E	IR Detector:	+0.000	+1.000	0.000	Counts	
F	LO Monitor I:	+0.000	+0.000037	0.000	Amps	
10	+10V Bus:	+0.000	+0.0500	0.000	Volts	
11	GASFET Bias I:	+0.000	+0.000026	0.000	Amps	
12	Ground REF:	+0.000	+0.0100	0.000	Volts	
13	+Z Array V:	+0.000	+0.1023	0.000	Volts	
14	Rx Temp:	+101.05	-0.6051	0.000	Deg. C	
15	+X (RX) temp:	+101.05	-0.6051	0.000	Deg. C	
16	Bat 1 V:	+1.8225	-0.0038046	0.000	Volts	
17	Bat 2 V:	+1.9418	-0.0046890	0.000	Volts	
18	Bat 3 V:	+1.8699	-0.0041641	0.000	Volts	
19	Bat 4 V:	+1.7403	-0.0032880	0.000	Volts	
1A	Bat 5 V:	+1.8792	-0.0042492	0.000	Volts	
1B	Bat 6 V:	+2.0499	-0.0054532	0.000	Volts	
1C	Bat 7 V:	+1.9062	-0.0045331	0.000	Volts	
1D	Bat 8 V:	+1.7536	-0.0033192	0.000	Volts	
1E	Array V:	+8.055	+0.06790	0.000	Volts	
1F	+5V Bus:	+2.864583	4.090715E-2	-1.930042E-4	Volts	<< Rev
20	+8.5V Bus:	+7.720951	+8.25979E-3	-1.76254E-5	Volts	<< Rev
21	+10V Bus:	+8.882535	+1.39771E-2	0.000	Volts	<< Rev
22	BCR Set Point:	-6.1130	+1.1270	0.000	Counts	
23	BCR Load Cur:	-0.0477	+0.00767	0.000	Amps	
24	+8.5V Bus Cur:	-0.00179	+0.000894	0.000	Amps	
25	+5V Bus Cur:	-0.00104	+0.00406	0.000	Amps	
26	-X Array Cur:	-0.00995	+0.00243	0.000	Amps	
27	+X Array Cur:	-0.02370	+0.00254	0.000	Amps	
28	-Y Array Cur:	-0.02220	+0.00273	0.000	Amps	
29	+Y Array Cur:	-0.01810	+0.00259	0.000	Amps	
2A	-Z Array Cur:	-0.02230	+0.00221	0.000	Amps	
2B	+Z Array Cur:	-0.02000	+0.00232	0.000	Amps	
2C	Ext Power Cur:	-0.02000	+0.00250	0.000	Amps	
2D	BCR Input Cur:	-2.103334E-2	+3.382738E-3	0.000	Amps	<< Rev
2E	BCR Output Cur:	-7.146611E-3	-5.247935E-5	4.878499E-5	Amps	<< Rev
2F	Bat 1 Temp:	+101.05	-0.6051	0.000	Deg. C	
30	Bat 2 Temp:	+101.05	-0.6051	0.000	Deg. C	
31	Baseplt Temp:	+101.05	-0.6051	0.000	Deg. C	
32	PSK TX RF Out:	-0.0291	+0.00361	+0.0000869	Watts	
33	RC PSK TX Out:	+0.0055	+0.00172	+0.0001180	Watts	
34	PSK TX HPA Temp:	+101.05	-0.6051	0.000	Deg. C	
35	+Y Array Temp:	+101.05	-0.6051	0.000	Deg. C	
36	RC PSK HPA Temp:	+101.05	-0.6051	0.000	Deg. C	
37	RC PSK BP Temp:	+101.05	-0.6051	0.000	Deg. C	
38	+Z Array Temp:	+101.05	-0.6051	0.000	Deg. C	
39	S band HPA Temp:	0.00	1.0000	0.000	Counts	
3A	S band TX Out:	-0.0088	+0.00435	0.000	Watts	

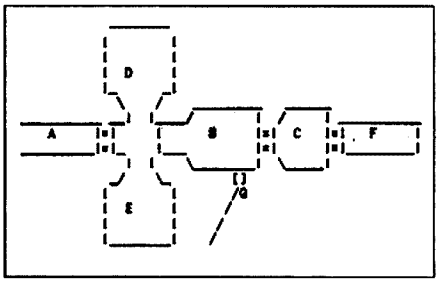
```
10 ' Procedure AMSATCS v1.0
20 ' Orbital Element Checksum Verification
30 '
40 '       by Dick Campbell, N3FKV
50 '       AMSAT Orbital Data Manager
60 '       Copyright 1991
70 '
80 ' Free and unlimited distribution for amateur radio
90 ' and amateur satellite purposes is granted. There
100 'are no warranties, express or implied.  AMSAT-NA
110 'may charge a handling fee for diskette copies.
120 '
130 'This program performs checksum verification of an AMSAT format
140 'orbital element set created in compliance with the "AMSAT
150 'Keplerian Element Set Standard" dated May, 1991.  See
160 'paragraph 4.3 for checksum definition.
170 '
180 'The AMSAT format element set(s) must be contained in a
190 'standard ASCII text file for proper processing.
200 '
210 PRINT" This verifies the checksum of an"
220 PRINT"AMSAT Orbital Element Bulletin File."
230 INPUT"ENTER FILENAME TO BE CHECKED: ",F$
240 '
260 OPEN F$ FOR INPUT AS #1
260 '
270 INPUT #1,L$
280 IF LEFT$(L$,10)="Satellite:"OR LEFT$(L$,10)="SATELLITE:" THEN 290 ELSE 460
290 CS = 0
300 N$ = RIGHT$(L$,LEN(L$)-INSTR(L$,":"))
310 IF LEFT$(L$,9)="Checksum:" OR LEFT$(L$,9)="CHECKSUM:" THEN 400
320 FOR J = 1 TO LEN(L$)
330 P$ = HID$(L$,J,1)
340 IF P$ = "-" THEN CS=CS+1
350 IF P$ = "+" THEN CS=CS+2
360 CS = CS + VAL(P$)
370 NEXT J
380 INPUT#1,L$
390 GOTO 310
400 CH = VAL(RIGHT$(L$,LEN(L$)-INSTR(L$,":")))
410 PRINT
420 PRINT"The Element Set for";N$;" checks ";
430 IF CS=CH THEN PRINT"GOOD." ELSE PRINT "* BAD *."
440 PRINT "Computed = ";CS;"      Checksum = ";CH
450 PRINT
460 IF NOT(EOF(1)) THEN 270
470 CLOSE#1
480 END
```

of benefit to future software authors, element set distributors and end users to ensure consistency and accuracy.

To enhance transmission accuracy, a checksum feature has been added as the last line of each set. This checksum will allow the user to verify that data have been received as created by the AMSAT distributor. Initial tests show that the addition of this line will NOT interfere with current tracking software conversion routines, and it is expected that later releases (of tracking software) would incorporate this verification feature. In brief, the checksum is merely the decimal sum of all numerical characters (and +/-) between "Satellite:" and the beginning of the "Checksum:" line.

A short BASIC listing to check a file of AMSAT orbital elements is included below. Complete details may be found in the AMSAT **Standard**. A hard-copy listing of this program is available from AMSAT HQ for an SASE, as are copies of the **Standard** for interested users. The program has also been posted to the DRIG BBS as AMSATCS.BAS (ASCII file).

Questions or comments about this new feature may be addressed to Dick Campbell, N3FKV via AMSAT HQ, by packet: N3KV@WD5KAL.NTX or INTERNET: n3fkv@tomcat.gsfc.nasa.gov.



Our Space Station

A Cargo ship
B Main module (main controls, main life space-cooking, exercises, Victor's sleeping place)
C Module "Kvant" (my rig is here)
D Module "Kvant-2" (life systems, exit for EVA)
E Module "Kristall" (ovens for technology-semiconductors, etc; my sleeping place)
F Our space ship (very good indeed) ar

For satellite Activity March/April see P51

Remember to leave a three-second break between overs when using a repeater

SPOTLIGHT ON SWLING

BY ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

As I was compiling this month's column, I received a rare QSL card from North Korea. I have heard it over a period of time, and decided to forward a report of its English Language broadcast. It is easily heard on 9977kHz between 1100 and 1150 UTC. Its signal level is usually good, but can fluctuate from day to day. Besides the QSL, I also received a mini-guidebook, a bright banner, a book on the Korean Art Gallery, plus a booklet on political life in this small nation wedged between Japan and China.

I was surprised to get this QSL, as Radio Pyongyang has been very hard to verify, particularly by North American DXers. This nation has adopted a strong anti-American posture since its formation, and this is reflected in its output. So I was glad to get another country confirmed on shortwave, and have resolved to get back into DXing again.

Another major international broadcaster is instituting programming cutbacks in its English language output. Kol Israel in Jerusalem has announced that it is cutting back its English programming to solely North American audiences as from 1 July. This will mean that the 0400 UTC English news from Jerusalem, which is easily heard in Australia, will be axed. It seems a pity, as Kol Israel does give the best coverage of Mid-East news, in my opinion.

The Voice of America has announced that it is moving its HF transmitters from Liberia to Botswana. You may know that Liberia has been plunged into a bitter internecine civil war for the past nine months, without any sign of peace. It was reported that the VOA site at Careysburg was severely damaged in the fighting, and has not been heard of since, sustaining severe damage. The move to Botswana, which is just above South Africa, has also been made, because it is more politically stable than the West African country. The VOA already has a powerful MW sender there, which extensively serves southern Africa.

Also, the BBC External Services has confirmed that it is going to close the Hong Kong Relay site in 1997, because the Chinese would not guarantee it would be free of censorship. Hong Kong reverts to Chinese sovereignty on 30 June 1997. It is rumoured that London is now looking seriously at proposals to co-operate with other international broadcasters in a joint venture to build a facility in south-eastern Asia. Several broadcasters have been thinking of such a site for many years.

One international broadcaster, the Deutsche Welle site in Cologne, has a relay site in Trincomalee, Sri Lanka. Although it is still on, the region is in the thick of the civil war between the Tamil minority and the Sinhalese dominated government. Several times the site has come under attack and was off-air for a time. DW management has been reviewing the viability of the station and the security of the technical personnel.

From 1 July, there will be minor alterations to the HF maritime allocations. In most cases, it will mean only the shifting of channels by a few kilohertz. Yet the Telex and Radphone channel allocations will also increase slightly to cover increased traffic. The Radphone Service of OTC will now be extended to cover the Landmobile Service, as well as ships at sea. Some HF coastal radio stations will eventually close, such as VIH - Hobart Radio, VIR - Rockhampton, which are slated to close on 1 February 1992. VIA in Adelaide will close 12 months later. The eventual plan is to centralise all HF traffic via VIS and VIP, in Sydney and Perth respectively.

Well, that is all the news for this month. Until next time, the very best of listening and 73.

ar

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

I have just returned from a visit to the Annual Conference of the NZART, the New Zealand equivalent of our WIA. The arrangement between the two societies is that each attends the other's Annual Convention or Conference in alternate years.

Last year the WIA was host to two New Zealanders, one of whom was Cathy Purdie, the Education Officer. She and I spent considerable time discussing examination devolvement which was just then beginning in New Zealand, so when I was offered the opportunity to follow up on their examination system a year later, I could not decline. I found the trip well worthwhile.

The New Zealand Radio Frequency Service (equivalent to DoTC) has had an entirely different approach to the devolvement. The authority has been given to NZART, and to NZART only, to produce examination sessions, mark papers and submit results to the candidates and the RFS. The appointed Examinations Officer has had to produce the question bank (which was done mostly from questions previously used on official papers which were not kept secret) and the production system. At the moment, examinations are run only twice a year, although there are plans to increase the frequency. Each paper is checked by an assistant, then submitted to the RFS for approval before being used.

The examination sessions are organised by the branches (NZART has over 80 branches) and run simultaneously. Papers are then returned to the Examination Officer for marking and result recording. Only one Theory paper is used, with the candidate receiving a Novice qualification for a lower mark than that required for the equivalent to AOCP. At present the RFS is still examining the Morse code, but it is expected that this will also be devolved very soon.

So far the system seems to be working reasonably well. There are problems similar to ours in that the question bank is too small, and they do not have a formula for the question distribution.

New Zealand has a big advantage over Australia in the large number of Branches so that the whole country can be covered by the Branches for examination purposes. In reality, the Branches function as local clubs, ranging in membership from 5-10 to over 200. Some special interest groups such as VHF groups form separate branches. Each branch has voting rights at the AGM in proportion to its membership.

Two points I found surprising - the small number of Novice licensees (less than 30 total in the Callbook) and the lower average age of members. Cathy Purdie and her group are working vigorously to make amateur radio available and popular in the schools by preparing both educational and promotional materials, and a number of schools have classes and operating stations.

It was also very interesting to note the similarities in the approaches of NZART and WIA. The Morse code debate ranges as extensively there as here, and the discussions on finance, recruiting and preparation of publicity materials had a very familiar ring.

I will be presenting a full report on the trip to Executive, and will be using the information gained in future discussions with both DoTC and Councillors. I hope that the two bodies can continue to increase the co-operation and sharing of both ideas and materials that have been started. 73 ar

FTAC NOTES

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

New VHF Records

On 15 April, Mike Hastings VK4BFO worked J17DMB, creating a new national 2 metre record of 6763.6. km. The NSW 6 metre record has also been broken again, with a contact between VK2JSR and FC1VYM, a distance of 16,690 km. Congratulations to these new record holders.

New Call Book

It is time again to update the beacon and repeater data base for the next Call Book. Repeater, beacon and packet radio groups - please send any additions or corrections as soon as possible!

50MHz Beacons

Comments would be much appreciated on ways of overcoming the present difficulties in setting up 50MHz beacons in the eastern states. Only two frequencies (50.056 and 50.066) are available at present within the DX window, and both of these are in use outside the eastern states. There are strong objections to using time-sharing for new beacons on these frequencies.

Federal Council have agreed that the 50MHz beacon policy should be reviewed. Likely changes are the dropping of the time-sharing policy and the allocation of extra frequencies - or both.

One alternative is to move eastern state beacons to 50.056 or 50.066MHz without time sharing. This would mean that overseas stations could possibly hear more than one Australian beacon on the one frequency, and eastern state amateurs could have problems in hearing the existing Perth and Darwin beacons.

Another option would be to allot extra frequencies, say 1 or 2kHz away from the existing 50.056 and 50.066 channels, for use by eastern state beacons. This would overcome the problem for overseas stations but would still cause some QRM for those who live near a beacon. However there is no way around this - if there are 50MHz beacons it is inevitable that someone will live near them.

So the question is, how can we establish 50MHz beacons in the eastern states with a minimum of interference? I would like to resolve the situation as soon as possible and would therefore appreciate any advice from 6m operators. ar

REPEATER LINK

WILL MCGHIE VK6UU @ VK6BBS
21 WATERLOO CR LESMURDIE 6076

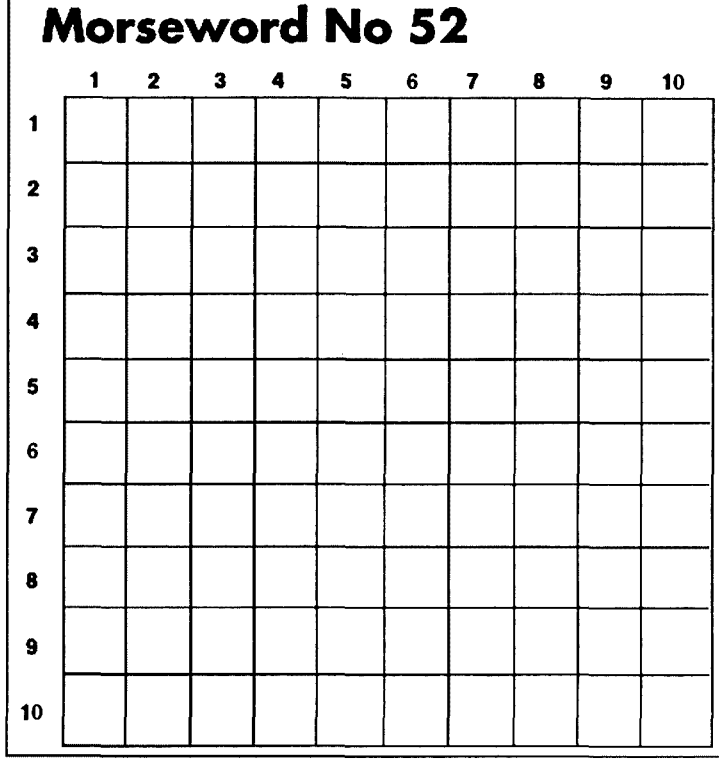
Busselton, a seaside town 200km south of Perth, is the latest site for a 2m pager. I say 2m, because it might as well be in the 2m band. All of 30kHz above 148MHz.

The local repeater users with an input on 147.950MHz wondered what was wrong. Even strong local amateur signals were being desensed, just simply going noisy for about three seconds several times every minute. What was wrong with the repeater?

This type of desensing has no modulation on it. The amateur signal would simply become noisy. A couple of weeks down the log book, all was revealed, Busselton was the proud site of a new Telecom pager. As you can see, the pager is only 80kHz above the amateur repeater's input frequency. Even though the repeater is 15km from the pager, the potential to cause a problem to the repeater is considerable. The problem that the pager is causing to the amateur repeater is, at the time of writing, still under investigation. Pager interference to amateur repeaters can be difficult to solve. Is it intermod or is it RF noise out of the pager? A visit to the site by amateurs from Perth will have to take place. The best attitude is to treat the whole situation as a technical challenge. Previous pager problems in and around Perth have been solved, and so will this one. One such previous pager problem was with a repeater that is co-sited at an amateur's QTH, namely mine. Suddenly, one day our 6750 repeater burst into life with wall to wall pager intermod. The problem was big. Whenever the repeater was in use, it would be punctuated with loud pager intermod. Several days later, the source of the problem was found, another 2m receiver I had returned to service a few days earlier, by connecting an aerial. That's right, the intermod was in this receiver, and was re-radiated via the aerial into the repeater's receiver. Now you would think that the penny would have dropped a lot sooner, but I had eliminated this receiver earlier, because the intermod was still there whether the receiver was turned off. Wrong! It did not matter if the receiver was on or off. As soon as the aerial was removed, so was the intermod. This however was not the end of the story. This repeater has since been changed to a superior design, and guess what? No intermod when the problem receiver was re-connected to its aerial. The obvious lesson: use only the best performance receivers in repeaters. This cannot be stressed enough, in today's high power pager intermod environment. What is the pager problem like in the rest of the country? Perhaps you could let me know about solutions and problems.

A final point on the pager issue, does any one know the situation outside Australia? Are we the only country to have high power transmissions butted right up against a prime amateur band, without any guard band? Learning to live with, and hopefully solve this pager problem, is the only choice, but it would be interesting to know, are we unique? ar

Morseword No 52



Across
1 Neat
2 Stitches
3 Container
4 Tilt
5 Auction
6 Substance
7 Swift
8 Reclines
9 Leases
10 Indian dress

Down
1 Spinnakers
2 Warble
3 Untruth
4 Taxes
5 Perspiration
6 Strokes
7 Became bigger
8 Flag flower?
9 Bottom
10 Pieces

Audrey Ryan © 1991

Solution P 56

DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

New Council

Some 50 members attended the AGM on 1 June at Amateur Radio House. Nine members had stood for Council. A ballot was not required, and the following major positions were filled at a brief council meeting after the AGM. President: Roger Henley VK2ZIG; Vice Presidents: Terry Ryeland VK2UX and John Martin VK2EJM; Secretary: Bob Lloyd-Jones VK2YEL; Treasurer: Bob Taylor VK2AOE. Other members of Council are Reg Brook VK2AI; Roger Harrison VK2ZTB; Julie Kentwell VK2XBR and Tim Mills VK2ZTM. A future issue of these notes will detail other office bearers and positions. The only agenda item for the AGM was accepted with a slight amendment.

Several hundred QSL notification cards had been returned for inclusion in the handheld draw. The winner was David Parry VK2CDP. The Bureau also benefited by the cross-check the details provided.

Ballot for Two-Metre Handhelds

The NSW Division has a few Alinco 2m handhelds remaining from a membership service offer of a while ago. These are being offered to NSW Division members at $199 each (limit one). Apply in writing (no money at this stage) to Alinco, PO Box 1066, Parramatta NSW 2124. Closing date is Monday 15 July 1991. As demand is expected to exceed supply, a ballot will be conducted. Include a self-addressed stamped envelope with your application. The handhelds are new, in boxes, model number DJ-100T.

HF Relay for VK2WI

The Division until recently had used frequencies which limited coverage mainly to VK2. The success of the 30m transmission and the odd reports on the 10m coverage prompted a move to add further HF coverage. It is planned to use all practical HF bands, and these will be assessed by the use of relay stations on behalf of VK2WI. The first is on 15m on 21.170MHz, morning and evening. Our thanks to Peter VK2NPW. When these notes were compiled, we were still seeking a relay onto 20 metres. Any offers?

Membership Cards

The membership card for this year was included on the inside back cover of the annual report along with the QSL registration card. Several of the membership cards were returned with the QSL card. If yours was one, make arrangements to collect same from the Parramatta office. VK1s perhaps enjoyed reading the VK2 annual report; it was included in VK1 postcodes in the mail-out of May *Amateur Radio*.

WICEN (NSW) Inc

To take advantage of the benefits of incorporation, WICEN in VK2 made the move a couple of years ago in this direction under the charter from the Division to provide WICEN on behalf of the Division. WICEN in VK2 has continued to grow with many active country groups. To allow all groups more active involvement in administration a special general meeting at Wyong in May made the required changes to the 'rules'.

Major exercises over the next few months include: 21 July, Amaroo Car Rally and Sutherland to Surf footrace, both in Sydney; 11 August, City to Surf in Sydney; 24 August, AGM at Parramatta; 7 September, Batemans Bay Car Rally; and 19-20 October, Outward Bound Hawkesbury Canoe Classic.

Gladesville/AUSSAT Test

The next in the series is being planned for late July, with the major theme on material from NASA. Further tests are planned for late September and November. Listen to your local Divisional broadcast for further details.

New Members

Recent new members who joined the VK2 Division included:

K R Attfield	Assoc	Roseville
D A Creelman	Assoc	Epping
B J McMaster	VK2KQH	Sydney
B A O'Neill	VK2MQ	Tumut
A Pace	VK2PTA	Wentworthville
S R Subramani	VK2GDR	Caringbah

A warm welcome is extended to these new members.

ar

5/8 WAVE

JENNIFER WARRINGTON VK5ANW

They Got It Wrong (and it wasn't me!)

Apparently someone gave out the wrong dates for the Hobby Fair; it is to be held on 27 and 28 July, so if you were really disappointed, thinking that you had missed out - take heart - you can still volunteer! We have a marvellous spot centre stage in Centennial Hall, Wayville Showgrounds, thanks to Trevor Colwell of ACBRO (Assoc of Citizens Band Radio Operators). So, if you can help, a member of Council would love to hear from you.

New Council Line-Up

Speaking of council members, here are the 1991/2 members and their positions:

Rowland Bruce	VK5OU	President
Bob Allan	VK5BJA	V Pres, DoTC Liaison & SATAC Co-ord
John McKellar	VK5BJM	Secretary & Education Officer
Rob Gunnourie	VK5FI	Membership Secretary
Don McDonald	VK5ADD	Minute Sec, Examinations Officer & Immediate Past President
Bill Wardrop	VK5AWM	Treasurer & Federal Councillor
Ian Watson	VK5KIA	WICEN, Country Clubs' Rep & Alt FC
Peter Maddern	VK5PRM	Building Supervisor & Program Director
Mark Spooner	VK5AVQ	Assist DoTC Liaison & Assist SATAC* Co-ordinator

Clubs' Reps

Barossa ARC	Ian VK5KIA
Lower Eyre Peninsular/ARC	Bill VK5AWM
Darwin ARC	Harry VK5AHH

*SATAC = South Aust Technical Advisory Committee

New QSL Bureau Manager

Alan Roocroft VK5ZN volunteered his services, and has been co-opted onto Council as the new QSL Bureau Manager. Like Rowland before him, he will be excellent in the job, being an avid DXer himself. Thanks, Alan, the world needs more like you.

If you would like to contact Alan you can write to him c/- The QSL Bureau, PO Box 10092, Gouger St, Adelaide 5001.

If you haven't been to a monthly meeting lately, you might notice a few changes. The clock has been repaired and now keeps good time thanks to John Butler VK5NX. Attendees now wear smart new name tags, so that you can match the face to the callsign! (It is even rumoured that there might be a door prize or name-tag draw).

Whether you are a very new member, or just one who hasn't been to a meeting in a while, do come along. You can pick up your QSL cards, buy components from our well-stocked equipment supplies, or buy publications from our Publications Officer, Ian Watson VK5KIA.

Meetings are held on the fourth Tuesday of each month (except Dec) at 7.45pm in the Burley Griffin Building, 34 West Thebarton Rd, Thebarton. And, where there is a fifth Tuesday in the month, we hold a Buy and Sell meeting where members can sell their "pre-loved" gear (and buy someone else's).

Diary Dates

Tues 23 July

Ian Hunt VK5QX will give his talk and video on the USA, Alaska, and through the Pacific, which was postponed from June.

Tues 30 July

Buy and Sell night. **ar**

QSLs FROM THE WIA COLLECTION

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139. PHONE: (059) 64 3721

The International Red Cross

In this series of articles on various themes depicted on QSL cards, the writer has given an account of the Olympic Games created by one man, Baron de Coubertin (see "QSLs of the WIA Collection *AR* June and July 1990) and that great institution, The Boy Scout Movement founded by Baden-Powell (See "QSLs of the WIA Collection" in *AR* Jan and Feb 1991). To complete the trilogy is Henri Dunant, who was instrumental in establishing the International Red Cross. Born in 1828 at Geneva, the young Swiss had witnessed the horrific suffering of soldiers at the Battle of Solferino in 1859 between French and Austrian forces. The casualties of the battle between cannon and horsemen are said to have reached 40,000. For a young banker who came from a society that was protected from such events, the terrible experience had a marked and lasting effect upon his life. He wasted no time in establishing a temporary hospital in a nearby church to give care to the wounded and dying. Returning to Geneva, and determined to do something about the situation, he wrote of his experiences in a book entitled *Un Souvenir de Solferino*, published in 1862. It had far-reaching effects.

The next year, together with four prominent Geneva citizens, Dunant decided to create the "International Committee for the Relief of the Wounded" (later to become the "International Committee of the Red Cross"). In 1864, the first Geneva Convention was held whose aim was to ameliorate the conditions of wounded in the field of battle. The first national associations were also founded in the same year. The symbol of the Red Cross Movement was a red cross on a white background, the reverse of his beloved Switzerland. In Muslim countries, the chosen symbol of the Movement is a Red Crescent. Red Crescent Societies work together with those of the Red Cross throughout the world, the two symbols standing side by side in international publications. The Franco-Prussian War (1870-71), the Boer War (1899) and the First World War were to test the efficacy of the new Movement. Nearly a half-million prisoners were repatriated through the ICRC, and a similar number were treated for wounds during World War 1. The Movement's activities were even greater during World War 2. Relief food, clothing and shelter programs, the establishment of tracing agencies and repatriation assumed gigantic proportions. The Australian Red Cross celebrated its 75th anniversary in 1989, since it was in August 1914 that the Movement in this country arose out of a public meeting at Government House, Melbourne, called by the wife of the then Governor General, Lady Helen Munro Ferguson.

Originally the Australian Red Cross Society (ARCS) was a branch of the British Red Cross Society, but in 1927 received recognition by the ICRC, being incorporated by Royal Charter in 1941. The National Headquarters of the ARCS is located in Melbourne and, through a series of committees in peace time, is concerned mainly with the Blood Transfusion Service, Health and Safety Education, Youth, International Humanitarian Law, Fund Raising and Finance. One important aspect of the Red Cross in Australia is the work of its Youth Department in each State and Territory. Junior members, especially in schools conduct both camps and fund-raising schemes.

HL0FRC

This QSL is the especially assigned call of the Republic of Korea National Red Cross (Special City of Seoul Charter). It shows the founder of the Red Cross Movement. The WIA Collection also contains the QSLs of some other chapters and branches of the Movement (eg HL0IRC, HL0NRC). Readers will realise that the HL0 prefix is restricted to institutions such as schools, universities, Scouts and clubs.

DL0RZ

This QSL, dated July 1972, was sent to well-known Old Timer "Snow" VK3MR from the German Red Cross. It bears the especially assigned suffix, RZ (Rotes Kreuz=Red Cross). Beside the red cross is the symbol of the City of Berlin. Several Red Cross QSLs with the special DL0 and DK0 prefixes have been issued. The WIA Collection also contains the QSLs DK0DD (Dusseldorf), DL0IX (Neukirchen) and DL0RK (Bonn). Germany is one of the 126 countries in the world having affiliation with the International Red Cross.

ST2FF/ST0

During the past few years, the people of Sudan and the recently formed "Autonomous Southern Region of the Sudan" have been suffering great hardship through both drought and refugee problems. Refugee camps hold hundreds of thousands of people. One of the aims of the two Finnish operators of this DXpedition was to appeal for funds so that the International Red Cross would be able to help these unfortunate people. The QSL shown and dated June 1980 was sent to well-known DXer, Steve VK3OT from the Autonomous Region close to the equator, where the operators, using a 15m quad and 12AVQ antennas, made 9000 QSOs during their few days of operation.

OR4CR

In November 1970, East Pakistan (later to be called Bangladesh) was devastated by a severe hurricane. The Belgian Government decided on a rescue operation and called upon the Belgian Red Cross to assist the Belgian Union of Radio Amateurs (UBA) to handle the radio equipment for the operation. Operations continued through the period November 1970 to March 1971, three Belgian operators, ON4JL, ON5DO and ON4QJ establishing their station at Dacca. The special prefix OR (used also for other Belgian stations abroad such as in Antarctica) was granted, together with the significant callsign suffix, CR (Croix Rouge=Red Cross). The QSL shown was sent in March 1971 to "S K" George Turner VK3GN from the Belgian Medical Relief Mission.

It is strange that Henri Dunant was a name

soon forgotten after his initial steps to found this great Movement. For many years people thought him dead but, in fact, he had been living in necessitous circumstances in an almshouse in Heiden, having left Geneva in 1867. So involved had he become in seeking support for the Movement that he had neglected his business activities. He became bankrupt. From then on he lived in obscurity and poverty until, in 1895, a Swiss journalist "rediscovered" him at Heiden.

He became a celebrity virtually overnight. Pope Leo XIII sent him his portrait, the Empress of Russia bestowed a small pension upon him, and he received honorary memberships to several societies. But, perhaps his greatest honour was to be the co-winner of the first Nobel Prize for Peace (1901).

Yet again was he destined to lapse into virtual obscurity. Storm clouds were over Europe and Dunant was again quickly forgotten.

He died on 20 October 1910, aged 82, at Heiden in the same almshouse in which the world had found him. His grave is in Zurich.

Whether a member of the WIA or not, you the reader, can play a part in the Institute's task of establishing a world-class QSL collection which is so useful for radio historians and to save something for the future. Past friends of "Silent Keys" may also assist by approaching the family for their assistance in this regard. Please contact the writer of this series of articles. ar

CLUB CORNER

Townsville Amateur Radio Club

We have received an invitation from the Jiangsu Radio Sports Association to send a fox-hunting team to Nanjing in China early in August this year to compete in the Jiangsu Provincial Radio Ranging Contest.

Other teams taking part are from the cities of Nanjing, Zhenjiang, Changzhou, Suzhou, Lianyungang, Huayang, the Southeast University, the Nanjing Post and Telecommunications College and JARL Aichi Branch. The Townsville team is Ray VK4LU, Ken VK4QZ, John VK4AFS and Wally VK4DO leader.

WALLY WATKINS VK4DO

Riverland Amateur Radio Club Two Years Old

The Riverland Amateur Radio Club has just celebrated its second birthday.

Having had its inaugural meeting in May 1989, it has now approximately 25 members, who are enjoying several social events, evening visits and addresses.

The club is always looking for new ideas to interest its members. The end of March saw a good response to an evening at the St John Ambulance communication centre at Berri.

At the monthly meeting of the club on 4 April, Geoff Stevens from DoTC in Adelaide addressed the meeting on the subject of interference to radio and television. Geoff answered many questions at the end of his address, with particular emphasis on the interference from paging systems on the 2m band, where there does not seem to be any immediate solution.

On 16 April, an evening was organised for a tour of the Telecom centre at Berri; members also viewed the microwave dish complex.

Several members of the club travelled to Mildura on 18 May for a buy, sell and swap meeting organised by the Sunraysia Radio Group; Stewart Electronics also had a comprehensive display of goods for sale.

Congratulations to three of our members. John Crozin VK5PJC and Chris Hedger VK5PBI for obtaining their novice calls. Mike MacIntosh VK5KLG for passing 10wpm.

The club will be holding its annual general meeting early in July.

The club is also conducting two Slow Morse sessions weekly in conjunction with the WIA (SA).

DOUG TAMBLYN VK5PDT
SEC, RIVERLAND ARC
ar

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to advise the recent passing of:
Mr R J (Bob) Butler VK2SO
Mr Ian W Jay VK3ZB

Ian Walter Jay VK3ZB

Ian was born in Essendon, Victoria, on 7/2/21. He matriculated from Essendon High School. His working life began with the then PMG's Department as a mechanic-in-training in 1938. Ian progressed through the PMG (later Telecom) and retired as Director of Recruiting.

He was a Commissioned Officer in the 1st Australian Beach Signals, 2nd AIF. He served in New Guinea and Borneo, was wounded and returned to Australia and discharged in August 1945.

Ian and his XYL caravanned around Australia. During these many trips, contacts were made via amateur radio with his amateur friends Doug Paine VK3FH SK, Bernie Fayle VK3IW SK, Dick VK3RZ and myself, Ray VK3JI.

Ian began his amateur activities on 17/12/53, and was licensed as VK3AXJ (later changed to VK3ZB). He obtained DXCC on phone in June 1981. He was also a member of the RAOTC.

Ian left us on 4/3/91 after a short illness. He is survived by his XYL Louise, and children David, Jenny, Helen and Marg.

Myself and Ian's many friends have had the privilege of having the love and friendship of a wonderful man. In my case this extended for some 45 years. This friendship will never be forgotten.

RAY JEPSON VK3JI
ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Need for Code

I have refrained from entering the CW debate as I have not felt strongly enough about the issue to become involved. However, as the debate has been raging in the columns of *AR* for some time and shows no signs of abating, I feel compelled to shove in my oar.

I would like to draw an analogy with another sphere of activity with which I am involved, namely boating, both for recreation (sailing), and professionally as a hydrographic surveyor. In the latter category I am closely involved with various aspects of the maritime industry. In order to operate a boat commercially and, in some states, for recreation, it is necessary to hold the appropriate qualification according to the size of the vessel and type of service.

There are those who maintain that it is not possible fully to understand seamanship unless you can handle a boat under sail in any conditions. Compare this with similar statements that you can only be a competent radio operator if you can use Morse code under adverse conditions. It was once necessary to qualify under sail for any grade of qualification to operate a boat or ship. This is not now necessary, and examinations now reflect current requirements, practices and technology. Nevertheless, many people, including professionals, enjoy sailing as a recreation, and even navigate boats around the world under sail, the ultimate achievement.

Why cannot amateur radio qualifications be considered in the same way? The examination syllabus should be progressively changed to reflect current technology and practices while deleting topics which are no longer relevant. This means replacing such things as proficiency in Morse code with a knowledge of modern data transmission, radio modems and satellites.

If Morse code is dropped as an examination requirement, it should still be permitted for those who are keen to give it a try, just as sailing craft are still permitted on our waterways. This will keep amateur radio qualifications and knowledge of radio up to date but will not prevent those with an interest in Morse code from using it on air.

KEVIN L FELTHAM VK3ANY
PO Box 61
PORT ALBERT 3971

Morse is Ancient

Those blokes who continue to knock Morse code because it is "an archaic mode" please observe the analogy between the use of Morse and the following brief list of activities keenly

followed by enthusiasts for the love, joy or charm of the pursuit:

Model engineering, steam train activities, horse riding, vintage automobile restoration, bi-plane aircraft restoration and flying, archery, cricket, yachting, valve radio restoration etc.

We are all aware of the technical superiority of telegraphy over voice in difficult conditions. I do not maintain, however, that any great proficiency in Morse should be a mandatory requirement for HF operation, but rather, those with a proven interest in the code should be allowed unmolested access to the traditional "bottom end" of the HF allocations. Radiophiles who are deaf to the charms of Morse, or cannot learn it (yes, I'm sorry, it does take some effort, and the skill cannot just be bought off the shelf like a transceiver) should nevertheless be allowed access to the bulk of the amateur HF spectrum. Right or wrong, Morse is seen by many as an artificial and irrelevant impediment to their fuller enjoyment of the hobby, and we are obviously losing people who would otherwise make a valuable contribution to the art.

DREW DIAMOND VK3XU
"NAR-MEIAN"
LOT 2 GATTERS RD
WONGA PARK 3115

Coded Transmissions

Amateurs use many types of coded transmissions; most require special equipment and technology PLUS near perfect characters and spacing for intelligent results. The most used amateur allocations are between 1.6 and 30MHz where the transmissions vary with time of day, season and solar cycle. This restricts machines requiring precision interference free pulses. Voice transmissions are limited by the language barrier, to be solved in a future millenium!

Consider a simple code system adapted from railway signalling. It can convey messages in many languages, even Japanese. This versatility has led to its adoption internationally. It has a set of 'short form' messages, Q & Z codes, and many 'common usage' ones. Like ALL message handling it involves a degree of mental and manipulative skill. It is not patented and can cope with many of the interference problems that restrict complex systems. This is a GIFT, available to overcome the complications of 'advanced methods'. Contact can be established around the world, conditions permitting, with a simple CQ. 50 years ago it had the ability to pass traffic at 120wpm!!

The ITU is sound in retaining our most basic communication method. Don't miss out on joining, to date, the only world 'language'. This code, if sent by hand, is as personal as handwriting, more individual than mere communication.

Every worthwhile advance on LF, MF or HF was pioneered by CW including the frequency stability that made SSB possible! It is the method of 'last resort'. Serious HF communicators should not miss acquiring a modest proficiency in this invaluable method and USING IT. Readability is more important than speed; five wpm may not sound much but it will convey every important message you are likely to transmit including distress ones. Remember, the faster you send, the fewer people can copy it.

ROBERT R.MCGREGOR VK3XZ
2 WILTSHIRE DRIVE
SOMERVILLE. 3912

Stop Pirates

I would like to see the WIA set up a register of companies and retailers who in the interest of amateur radio will not supply un-licensed persons with amateur transmitting equipment.

To qualify a company to be listed on such a register, the management must sign an undertaking "that they or any member of their staff will not supply amateur transmitting equipment to any person unless a current operator's certificate (with photo) is produced at the point of sale".

Such a register could be published in AR each month. It would then be up to hams to support these companies and blacklist the rest. I realise that this could cause some inconvenience for some people (mail orders etc) but perhaps a photocopy of your licence could be used. Anyone "lending" their certificate for mail order to an un-licensed person doesn't deserve a licence and should have it cancelled by DOTC if proven.

Let's make it as hard as possible for pirates to wreck our bands, and keep what band-space we have left. Look what happened to 27 MHz.

A J GILCHRIST VK5BWG
P O BOX 1337
STIRLING NORTH 5710

Call Signs (A thing of the past?)

Over the last few years I've noticed a trend by amateurs in their operating procedure., I've been doing a fair bit of travelling for a while now and so I hear probably a broader cross section of skills than most. This comment mainly refers to the slang call signs used by quite a few amateurs particularly when they are on VHF/UHF repeaters. The DOTC licenses all of us with a VK (call area) and then either two or three letters, eg VK4CRR etc. However, some think that they can just use the last letters eg 4CRR or even just CRR whilst chatting locally on repeaters. Occasionally I even hear this practice used on the 80m band.

If this practice is not stamped out we may as well resemble the AM 27MHz band and give ourselves a call sign like "Big Ben" or "Smoky Sue"!

BILL HORNER VK4CRR
26 IRON STREET
GYMPIE 4570
ar

Satellite Activity for March/April 1991

1. LAUNCHES

The following launching announcements have been received:

Intl No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1991-							
023A	COSMOS 2138	26 Mar	USSR	89.6	369	175	67.2
024A	ALMAZ-1	31 Mar	USSR	88.7	280	170	72.7
025A	COSMOS 2139	04 April	USSR	676.0	19148		64.8
025B	COSMOS 2140	04April	USSR	676.0	19148		64.8
025C	COSMOS	2141	04April	USSR	676.0	19148	64.8
026A	ANIK E-2	05 Apr	ESA	1090.7	35748	21693	0.2
027A	STS-37	05 Apr	USA	93.8	465	449	28.5
027B	GRO	05 Apr	USA	93.7	463	449	28.5
028A	ASC-2	13 Apr	USA	656.1	35920	1348	22.5
029A	COSMOS 2142	16 April	USSR	105.0	1031	983	83.0

2. RETURNS

During the period 40 objects decayed, including the following satellites:

1980-053A	MOLNIYA 1-47	01 Apr
1989-079A	COSMOS 2046	06 Apr
1990-096A	COSMOS 2103	03 Apr
1991-008A	COSMOS 2124	07 Apr
1991-011A	COSMOS 2134	01 Apr
1991-016A	COSMOS 2136	20 Mar

BOB ARNOLD VK3ZBB
ar

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

As from last month, the charts are now produced using the new software Graph-DX giving estimates *directly in signal strength.* The reference signal strength (0 dB) is 1 uV in 50 Ohms, which is between S3 and S4, if your S-meter is calibrated such that S9 is 50 uV and the lowest detectable signal is 0.1 uV (see Ref.1). Last issue, I also included three graphs, produced using Graph-DX, showing forecast propagation on 14 MHz to Bering Is (55 N, 165 15 E); a DXpedition is scheduled to be there from 27 July to 16 August. The caption "went missing", so the graphs are reproduced again (Figure 1), this time with the caption.

Six metres

Graph-DX also provides coverage of six metre propagation, too. For a 'taste' of what to expect this equinox, Figure 2 shows graphs for two paths: VK East to Tonga, and Nth Qld to JA. The signal strength scales, note, are in dBm. On VHF, the S-meter 'standard' is different to HF, S9 being 5 uV (-93 dBm), which makes S4 -123 dBm (see Ref.1). The ionospheric 'model' and signal strength calculation used in Graph-DX do not take 'special' propagation modes, such as TEP, into account. For these graphs, I assumed Tx power of 200 W and 4-ele Yagis. I'd be interested in any reported results. <bold> Ref.1. *Signal Strength, "S" Meters and Preamps,* Gordon McDonald VK2ZAB, AR, July 1990, p.14.

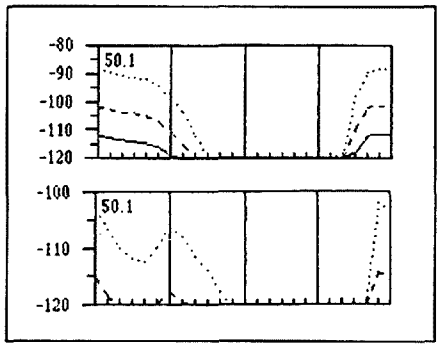


Figure 2. Some 6m forecasts, for September. Top chart: VK East to Tonga; Bottom: Nth Qld to JA. Solid line 90% of days, dashed line 50% of days, dotted line 10% of days. Signal strength in dBm. S9 is -93 dBm, S4 is -123 dBm.

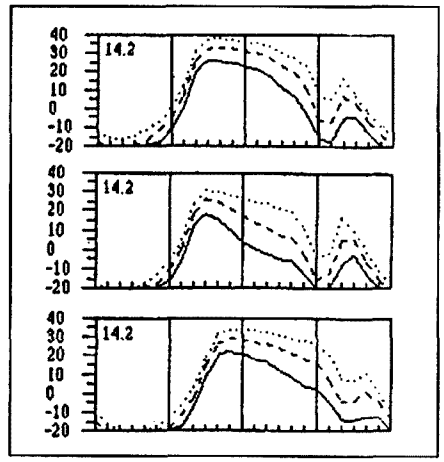


Figure 1. 14 MHz signal strength predictions for the Bering Is DXpedition, July-August. Top chart: VK East, then VK South, with VK West at the bottom. Solid line 90% of days, dashed line 50% of days, dotted line 10% of days. S9 is 34 dB, S1 is -14 dB. ar

VK EAST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.9	8	15.1	-3	7	8	5	0
2	19.8	2	14.9	-15	0	3	2	-1
3	22.1	1	16.4	-27	-6	0	2	0
4	25.0	2	18.9	-36	-11	-2	2	2
5	26.8	3	20.6	...	-13	-3	2	3
6	27.4	3	21.4	...	-14	-3	2	3
7	27.8	3	22.1	-37	-11	-2	2	3
8	26.9	3	20.4	-29	-7	0	3	2
9	23.6	3	17.8	-20	-2	2	2	0
10	20.4	3	15.4	-11	1	3	0	-5
11	17.4	3	13.2	-2	3	2	-4	-13
12	15.2	4	11.4	3	4	-1	-11	-24
13	13.5	8	10.2	8	3	-5	-19	-36
14	12.7	13	9.5	12	2	-9	-27	...
15	12.4	20	9.4	16	2	-11	-32	...
16	12.2	25	9.2	19	3	-13	-36	...
17	12.2	27	9.2	20	3	-14	-37	...
18	11.0	30	8.4	16	-4	-24	...	...
19	9.5	32	7.3	8	-17	...	...	...
20	9.2	32	7.1	6	-20	...	...	...
21	12.9	29	9.7	24	7	-9	-31	...
22	19.6	22	15.1	33	26	18	7	-5
23	18.3	20	14.0	23	20	15	6	-5
24	21.1	15	16.1	11	16	15	11	4

VK STH - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.0	14	15.2	11	15	13	8	0
2	19.8	7	14.9	-3	6	7	4	-1
3	22.2	4	17.4	-18	-1	3	4	1
4	25.3	4	19.2	-29	-7	1	4	3
5	27.1	4	21.0	-35	-10	-1	4	4
6	27.6	4	21.7	-38	-11	-2	3	4
7	28.0	5	22.4	-37	-11	-1	4	5
8	28.7	3	21.5	-30	-7	0	4	3
9	25.4	3	19.1	-22	-3	2	3	1
10	21.2	3	15.9	-12	0	3	0	-4
11	17.2	1	12.9	-4	2	0	-6	-15
12	13.8	1	10.3	1	1	-5	-17	-32
13	11.4	2	8.5	4	-4	-15	-34	...
14	9.9	7	7.3	3	-12	-29	...	...
15	9.3	17	6.9	3	-18	...	...	...
16	9.6	25	7.1	6	-17	...	...	...
17	10.1	27	7.5	9	-14	-36	...	...
18	10.5	29	7.9	12	-10	-32	...	...
19	9.8	30	7.4	9	-17	...	...	...
20	9.0	31	6.9	3	-25	...	...	...
21	8.9	31	6.9	2	-27	...	...	...
22	11.7	29	9.0	18	-2	-21	...	...
23	14.3	27	11.1	27	14	1	-17	-36
24	19.0	19	14.4	25	21	14	5	-6

VK WEST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	18.5	19	14.1	23	20	14	5	-6
2	18.3	11	13.8	7	11	8	2	-7
3	20.4	5	16.1	-7	4	5	3	-2
4	23.2	5	17.6	-17	0	4	4	2
5	24.9	4	19.2	-24	-4	2	4	3
6	25.3	4	19.9	-28	-6	1	4	3
7	25.7	4	20.5	-29	-7	0	4	3
8	27.0	4	21.7	-28	-6	1	4	3
9	26.7	3	20.2	-23	-4	2	3	1
10	24.2	3	18.3	-14	0	4	3	-1
11	20.7	4	15.6	-5	3	4	0	-7
12	17.5	5	13.2	2	4	1	-7	-18
13	14.5	7	11.0	7	3	-5	-19	-35
14	12.4	10	9.4	8	-2	-15	-35	...
15	10.9	17	8.2	8	-10	-29	...	...
16	10.2	24	7.7	7	-16	-39	...	...
17	10.3	26	7.8	8	-16	...	...	...
18	10.4	28	7.8	9	-15	-39	...	...
19	10.6	29	8.0	11	-13	-37	...	...
20	9.7	30	7.4	5	-23	...	...	...
21	8.6	31	6.6	-4	-37	...	...	...
22	8.4	31	6.5	-6	...	...	...	...
23	11.5	28	8.6	16	-6	-27	...	...
24	16.6	25	12.7	31	20	9	-6	-22

VK EAST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	19.3	16	13.1	15	17	15	9	2
2	18.4	18	12.6	18	18	15	8	0
3	17.6	20	12.0	21	19	14	7	-2
4	16.8	23	11.5	26	21	15	5	-5
5	16.9	23	11.7	26	21	15	6	-5
6	17.3	23	12.0	27	22	16	7	-3
7	18.6	21	13.0	25	22	17	9	0
8	16.9	14	12.6	16	13	7	-2	-14
9	13.6	5	10.0	6	4	-2	-13	-27
10	11.2	-8	8.3	0	-1	-8	-20	-35
11	9.7	-23	7.2	-2	-3	-10	-22	-37
12	9.2	...	6.7	-13	-12	-19	-31	...
13	9.4	...	7.0	-23	-19	-24	-36	...
14	9.8	...	7.2	-29	-22	-26	-36	...
15	10.1	...	7.5	-33	-24	-26	-35	...
16	9.4	...	7.1	...	-34	-37	...	...
17	8.7	...	6.6	...	...	...	...	...
18	8.5	...	6.5	...	...	...	...	...
19	11.1	...	8.1	-24	-14	-15	-23	-34
20	16.0	-9	12.3	-16	-4	-2	-5	-11
21	21.2	2	14.6	-16	-1	2	2	-1
22	20.9	8	14.3	-5	6	8	7	3
23	20.6	12	14.1	5	12	12	9	4
24	20.0	15	13.6	11	15	14	10	3

VK STH - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.8	13	12.3	10	13	11	5	-2
2	17.0	17	11.8	17	16	12	4	-5
3	16.4	20	11.5	21	18	12	3	-8
4	15.7	23	11.1	25	19	12	1	-12
5	15.9	24	11.3	27	20	13	1	-11
6	16.2	23	11.5	25	20	13	3	-9
7	17.3	22	12.4	25	20	14	5	-6
8	16.1	14	12.6	15	11	4	-7	-21
9	13.0	6	10.1	6	2	-6	-20	-36
10	10.9	-5	8.5	1	-3	-12	-27	...
11	9.7	-16	7.5	0	-4	-13	-28	...
12	9.4	-33	7.2	-8	-10	-17	-32	...
13	9.6	...	7.5	-19	-18	-24	-38	...
14	9.8	...	7.5	-30	-25	-30	...	...
15	10.0	...	7.7	-39	-31	-35	...	...
16	9.3	...	7.2	...	...	...	...	...
17	8.7	...	6.8	...	...	...	...	...
18	8.5	...	6.7	...	...	...	...	...
19	10.3	...	7.9	...	-38	...	...	...
20	14.0	-20	11.2	-19	-6	-5	-8	-15
21	19.2	-6	14.0	-25	-8	-3	-3	-7
22	19.6	-2	13.7	-24	-6	0	0	-1
23	19.1	2	13.3	-13	0	3	2	-1
24	18.5	8	12.9	0	8	8	4	-1

VK WEST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.1	2	12.0	-3	3	3	-1	-7
2	16.3	7	11.5	4	7	5	-1	-10
3	15.8	9	11.2	8	9	5	-2	-12
4	15.2	12	10.8	12	10	5	-4	-15
5	15.4	13	11.0	13	11	5	-3	-14
6	15.7	14	11.3	14	12	7	-2	-13
7	16.7	14	12.1	14	13	8	1	-9
8	17.9	14	12.9	13	14	10	4	-4
9	18.3	10	13.3	9	10	7	0	-9
10	15.9	3	12.4	1	3	-1	-9	-20
11	12.8	-7	9.9	-3	-2	-7	-17	-30
12	10.8	-19	8.3	-5	-5	-10	-21	-34
13	9.6	...	7.3	-17	-16	-22	-35	...
14	9.3	...	7.0	-33	-29	-35	...	...
15	9.4	...	7.4	...	-36	...	...	...
15	9.6	...	7.3	...	...	...	...	...
17	9.9	...	7.5	...	...	...	...	...
18	9.2	...	7.1	...	...	...	...	...
19	8.5	...	6.6	...	...	...	...	...
20	8.4	...	6.6	...	...	...	...	...
21	10.2	...	7.7	...	-34	-36	...	...
22	14.0	-19	11.1	-18	-7	-6	-10	-17
23	18.3	-6	12.9	-21	-7	-3	-4	-9
24	17.7	-3	12.5	-14	-2	0	-1	-6

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	10.0	6	7.9	5	-8	-24	...	...
2	9.5	-3	7.3	2	-8	-21	...	...
3	9.1	-12	7.0	0	-9	-21	...	...
4	13.1	-2	10.2	0	0	-5	-16	-30
5	20.9	5	16.2	-6	3	5	1	-4
6	27.9	5	21.5	-10	4	8	8	5
7	26.4	5	19.7	-9	4	7	7	3
8	23.4	6	17.5	-2	7	8	5	0
9	19.6	6	14.6	1	6	5	0	-8
10	15.9	6	11.9	4	5	0	-9	-21
11	12.8	4	9.5	5	1	-7	-21	-39
12	10.7	5	7.9	5	-4	-18	-37	...
13	9.3	9	6.9	4	-12	-29	...	...
14	8.9	20	6.5	5	-16	-38	...	...
15	9.1	27	6.7	8	-15	-38	...	...
16	9.5	30	7.0	10	-13	-35	...	...
17	9.4	31	7.1	9	-15	-39	...	...
18	9.0	33	6.9	7	-18	...	...	...
19	8.4	34	6.4	4	-23	...	...	...
20	8.3	34	6.4	3	-25	...	...	...
21	9.6	32	7.4	11	-13	-36	...	...
22	9.0	30	6.9	6	-19	...	...	...
23	8.3	20	6.5	1	-23	...	...	...
24	8.2	8	6.4	0	-21	...	...	...

VK STH - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.7	19	7.4	8	-10	-29	...	...
2	9.3	10	7.2	5	-11	-29	...	...
3	13.4	12	9.9	12	5	-4	-19	-37
4	21.2	12	16.4	12	14	12	6	-2
5	27.7	8	22.0	3	12	13	11	7
6	29.9	7	24.1	-1	10	13	12	9
7	28.3	7	22.7	-2	9	11	10	7
8	25.9	7	20.6	1	10	11	9	4
9	22.7	8	18.0	4	10	10	5	-1
10	19.3	9	15.1	7	9	6	-1	-11
11	16.0	9	12.5	10	7	0	-11	-25
12	12.9	10	10.0	9	1	-9	-26	...
13	11.0	12	8.5	8	-5	-21	...	...
14	10.1	20	7.7	8	-11	-31	...	...
15	9.9	26	7.6	9	-13	-35	...	...
16	10.1	28	7.7	11	-12	-34	...	...
17	10.0	30	7.7	12	-11	-33	...	...
18	9.8	32	7.4	11	-13	-36	...	...
19	9.6	31	7.4	9	-17	...	...	...
20	9.0	32	7.0	5	-23	...	...	...
21	8.8	32	6.9	3	-25	...	...	...
22	9.6	32	7.4	10	-14	-37	...	...
23	8.9	30	7.0	6	-20	...	...	...
24	8.8	25	6.9	4	-21	...	...	...

VK WEST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	8.4	24	6.5	2	-23	...	...	...
2	9.4	14	7.2	5	-12	-32	...	...
3	13.6	12	10.2	12	5	-5	-20	-38
4	21.7	11	16.8	12	15	12	6	-2
5	28.3	8	21.6	3	12	14	12	8
6	30.9	7	23.4	-2	10	13	13	10
7	30.6	6	22.9	-5	8	12	12	9
8	29.1	6	21.8	-5	8	11	10	7
9	26.6	7	19.9	-2	8	10	9	4
10	23.5	8	17.7	4	11	10	6	0
11	19.7	10	14.7	9	11	8	1	-9
12	16.0	12	12.0	12	9	2	-9	-24
13	12.9	16	9.6	14	3	-8	-27	...
14	10.7	22	7.9	12	-5	-23	...	...
15	9.3	28	6.9	8	-15	-39	...	...
16	8.9	31	6.5	6	-20	...	...	...
17	9.1	33	6.8	8	-18	...	...	...
18	9.5	34	7.0	11	-14	-38	...	...
19	8.9	35	6.6	7	-20	...	...	...
20	9.1	34	6.7	9	-17	...	...	...
21	8.5	35	6.5	4	-25	...	...	...
22	8.4	35	6.4	3	-27	...	...	...
23	9.4	34	7.1	10	-15	-39	...	...
24	8.5	34	6.5	4	-23	...	...	...

VK EAST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	34.3	21	25.9	30	34	34	32	29
2	33.7	22	25.4	30	35	34	32	29
3	33.2	22	25.1	32	36	35	33	29
4	32.4	23	24.5	35	37	36	33	29
5	30.6	25	23.1	41	40	38	33	28
6	28.1	28	21.2	49	44	40	34	27
7	24.6	30	18.6	49	43	37	30	21
8	21.3	33	16.1	48	40	33	23	12
9	18.2	35	13.7	45	36	27	14	1
10	15.9	38	11.9	43	31	19	4	-10
11	14.1	40	10.5	39	25	12	-4	-22
12	13.1	41	9.7	37	21	7	-11	-30
13	12.6	41	9.4	35	19	5	-14	-35
14	12.3	42	9.2	35	18	3	-16	-37
15	12.3	42	9.3	34	18	3	-16	-38
16	11.0	43	8.4	30	11	-5	-27	...
17	9.5	45	7.3	23	1	-18	...	...
18	9.2	45	7.1	21	-1	-21	...	...
19	13.1	39	10.2	36	21	7	-10	-30
20	20.5	30	15.8	40	35	29	19	8
21	27.7	25	21.3	37	37	35	30	24
22	32.2	23	24.6	34	35	35	32	28
23	33.8	22	25.7	31	35	35	33	29
24	34.4	21	26.0	30	35	35	33	29

VK STH - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.8	12	20.2	20	23	21	15	8
2	26.9	12	20.3	21	23	21	16	9
3	26.3	13	19.9	23	24	21	16	8
4	25.0	14	18.9	25	25	21	14	5
5	23.0	16	17.4	30	26	20	11	0
6	20.3	21	15.3	37	27	18	5	-10
7	17.8	24	13.4	35	22	10	-6	-24
8	15.3	26	11.5	30	14	0	-21	...
9	12.8	30	9.6	23	2	-17	...	...
10	10.7	33	8.0	13	-13	-38	...	...
11	9.3	34	7.0	3	-29	...	...	...
12	8.3	35	6.1	-7	...	...	...	...
13	7.8	36	5.8	-13	...	...	...	...
14	8.0	36	5.9	-10	...	...	...	...
15	8.4	35	6.2	-6	...	...	...	...
16	7.8	36	6.0	-11	...	...	...	...
17	7.6	37	5.8	-14	...	...	...	...
18	7.4	36	5.7	-17	...	...	...	...
19	7.3	32	5.7	-18	...	...	...	...
20	9.5	23	7.4	2	-25	...	...	...
21	13.7	17	10.6	16	3	-11	-32	...
22	18.9	15	14.5	21	16	9	-3	-17
23	22.9	13	17.5	21	20	16	8	-1
24	25.4	12	19.3	20	22	19	13	5

VK WEST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	31.2	9	23.6	7	16	18	17	13
2	32.8	8	24.7	7	17	19	18	14
3	32.6	9	24.5	8	17	19	18	14
4	31.7	9	24.0	11	19	20	18	14
5	30.0	11	22.6	17	22	22	19	13
6	27.4	14	20.7	27	27	24	19	12
7	24.0	18	18.2	33	29	24	15	6
8	20.7	22	15.6	36	28	20	9	-3
9	17.7	25	13.3	34	24	13	0	-16
10	14.5	29	10.8	30	15	2	-17	-38
11	12.0	32	9.0	24	5	-12	-37	...
12	10.3	35	7.7	17	-5	-27	...	...
13	9.6	36	7.1	13	-11	-35	...	...
14	9.2	36	6.8	11	-15	...	...	...
15	9.5	36	7.1	12	-13	-37	...	...
16	10.0	35	7.4	15	-8	-31	...	...
17	9.3	36	7.1	11	-15	-39	...	...
18	9.0	36	6.9	9	-17	...	...	...
19	8.9	34	6.8	8	-18	...	...	...
20	8.8	24	6.8	6	-18	...	...	...
21	11.6	17	8.5	13	0	-14	-36	...
22	16.9	15	13.0	17	13	6	-5	-19
23	23.3	12	17.9	15	18	15	10	2
24	28.2	10	21.5	10	17	17	15	10

VK EAST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.3	6	21.8	-28	-5	2	6	6
2	25.5	9	20.5	-16	1	7	9	8
3	24.7	13	19.8	0	11	14	13	10
4	24.2	18	19.3	15	20	20	17	12
5	24.3	22	19.3	29	29	26	21	15
6	24.2	23	19.1	37	33	29	22	14
7	23.8	20	18.4	38	32	26	17	8
8	21.3	21	16.2	37	29	22	11	0
9	18.5	24	14.0	35	25	15	2	-12
10	16.3	26	12.3	32	20	8	-7	-25
11	14.6	27	11.0	29	14	1	-18	-38
12	13.6	28	10.2	26	10	-4	-25	...
13	13.1	24	9.8	21	6	-8	-28	...
14	12.6	16	9.5	14	3	-10	-29	...
15	12.4	9	9.4	8	0	-10	-27	...
16	11.1	-3	8.4	1	-4	-15	-32	...
17	9.4	-19	7.2	-2	-8	-19	-36	...
18	9.1	-29	7.0	-3	-7	-16	-32	...
19	12.9	-15	10.0	-9	-4	-7	-15	-27
20	20.3	-2	15.7	-22	-5	-1	-2	-7
21	26.5	2	20.9	-33	-10	-1	2	1
22	26.8	4	22.0	-39	-12	-2	3	4
23	26.7	4	21.8	-39	-12	-2	3	4
24	26.7	5	21.7	-35	-10	0	4	5

VK STH - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.3	9	23.5	-26	-3	4	8	9
2	27.3	12	22.0	-11	5	11	12	11
3	26.3	16	21.1	6	15	18	17	13
4	25.6	20	20.5	22	25	24	21	16
5	25.7	23	20.4	33	32	29	24	18
6	25.7	19	19.6	38	33	28	21	13
7	21.9	21	16.3	37	30	23	13	2
8	17.7	24	13.2	34	23	13	0	-15
9	14.1	28	10.5	27	13	-1	-20	...
10	11.6	30	8.6	19	0	-18	...	...
11	10.0	31	7.4	11	-12	-35	...	...
12	9.3	32	6.9	7	-19	...	...	...
13	9.6	26	7.2	8	-15	-37	...	...
14	10.1	14	7.5	7	-9	-27	...	...
15	10.5	5	7.9	5	-6	-20	...	...
16	9.8	-8	7.4	0	-7	-20	-39	...
17	9.0	-21	6.8	-1	-8	-19	-37	...
18	8.9	-33	6.8	-5	-9	-19	-35	...
19	11.8	-18	8.7	-7	-3	-7	-17	-30
20	17.4	-5	13.4	-16	-4	-2	-5	-11
21	24.2	1	18.5	-27	-7	0	1	0
22	29.0	3	22.3	-35	-10	-1	3	3
23	28.9	6	23.6	-37	-10	0	4	6
24	28.9	7	23.5	-34	-8	1	6	7

VK WEST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.0	5	21.5	...	-12	-1	4	5
2	25.2	6	20.3	-30	-6	2	6	6
3	24.4	9	19.6	-17	1	7	9	8
4	23.9	13	19.1	-4	9	13	13	10
5	24.0	18	19.0	10	18	19	17	13
6	23.8	22	18.8	24	26	25	21	15
7	23.3	26	18.9	33	32	29	23	16
8	22.3	27	17.4	39	34	29	22	14
9	21.2	24	16.0	38	31	24	14	3
10	17.2	27	12.9	35	24	14	1	-14
11	13.7	30	10.3	29	14	0	-19	...
12	11.3	33	8.4	21	2	-16	...	...
13	9.7	28	7.2	12	-9	-30	...	...
14	9.0	14	6.7	6	-12	-31	...	...
15	9.4	5	7.1	6	-7	-23	...	...
16	9.9	-4	7.4	4	-4	-15	-33	...
17	10.5	-10	7.9	1	-2	-10	-25	...
18	9.8	-21	7.4	0	-2	-9	-23	...
19	8.9	...	6.8	-12	-13	-21	-36	...
20	8.8	...	6.8	-25	-23	-31	...	...
21	11.9	-25	8.8	-11	-3	-4	-11	-21
22	17.7	-7	13.7	-24	-6	-2	-2	-7
23	24.4	1	18.8	-36	-11	-3	1	0
24	26.3	3	21.3	...	-14	-3	2	4

VK EAST - USA/CARIBBEAN

VK STH - USA/CARIBBEAN

VK WEST - USA/CARIBBEAN

APOGEE ARTS

HAMADS

TRADE HAMADS

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FOR SALE - QLD.

● LINEAR Amplifier 2 1/2w.in 25w.out with r.l., vox 12volt $50. General coverage rx adaptor tunes 50Khz to30MHz in 1MHz segments using your 2 metre all mode transceiver 12 volt $180 VK4ZFQ Not QTHR ph. (077) 79 4641.

● SK400 FOR 3-500Z $80. 4-1000 socket $40. 3-30 Vacvar $50 Bridge 2000v 500ma $60 4-250A's $40 .001 3KV feedthroughs $5 ph VK4TL (070 54 3677.

FOR SALE - W.A.

● FT-1 transceiver as new condition used by present owner from new $1400 or very near offer VK6TP QTHR (09) 299 6741.

WANTED - N.S.W.

● COPY of circuit diagram for ICOM DV21 VFO for 2m pay all costs Rodney VK2CN QTHR (049) 49 8393 or (049) 29 2933.

● REINARTZ coil(s), six pin valve sockets, five pin plugs old 807 bottoms exchange valves IC4 ID4 for IP5-GT IH5-GT wanted phase shift network 2Q4 or similar VK2KSD QTHR.

WANTED - VIC.

● 150W HF AM TX with modulator and psu will collect. Jim VK3BCV 13 Outtrim St. Maryborough 3465.

● YAESU 625 6m all mode analogue or digital. Also mobile bracket for Icom IC202. Contact Roger VK3 XRS ph. (051)56 8291.

● TRANSVERTER FTV-107R Ant. tuner FC-107 Ext speaker SP-107P, to suit FT-107M Ph. (03) 547 0910 ah only.

● MANUAL for Realistic model 20-9131 PRO-30 scanner rx original or copy will re-imburse costs. Tandy/Radio Shack/ Realistic book. From 5 watts to a thousand " original or copy. Bruce Kendall VK3WL (03)741 1127 bh (03)741 7654 ah. 8 Walwa Place, Werribee.3030.

WANTED - QLD

● 11C90 650 MHz prescaler for freq counter (079) 57 7058.

● CIRCUIT workshop manual AWA voltohmyst 1A56074 also Linear type unknown has EEC on circuit boards also conversion info telex 2000 for TTY John Schumacher (070)91 2705 VK4DJS.

OSKERBLOCK 200 SWR meter in good order and condition only reasonable price ph (071) 25 3415 QTHR VK4ECS ask for Clarrie.

WANTED - S.A.

● HEATHKIT HW-16 HG10B HW101, DX-40; Eddystone EA12; Johnson 'Challenger', or 'Ranger II'; Hammarlund HQ-110; Drake T-4X, R4A; EICO etc similar vintage CW equipment. Also 2.4m fibreglass quad spreaders; details to 'Doc' VK5HP (086)49 1958 Whyalla S.A.

● SINGER GERTSCH FM10CS signal generator modules types OAM-1, MDM-1, AFM-2. Manual for RFM10B module CRT type D7/16GJ Steve VK5ZNJ (08)255 5284 (h) (08) 238 3210 (w).

WANTED - W.A.

● INTRUDER WATCH Observers in VK6. Free tape, logs, postage and advice. Please help. Contact Graham VK6RO QTHR (09)451 3561.

COPIES OF ARTICLES

Photocopies of any article published in a back issue of AR available to members at $2.50 each (plus $2.00 for each additional issue in which the article appears)

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PO Box 300
Caulfield South
Vic 3162

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
AVIEMORE RUBYVALE 4702

I am indebted to Col VK4AKX for the info herewith. Col has, over the past couple of months, been doing some interesting research into types of transmissions by the USSR. Some signals are heard in VK, mostly as harmonics, the fundamentals being in the VLF area of 20.5kHz. These appear to be either time signals or are possibly used as navigational aids.

Russian maritime stations use three letters as a callsign; ships use four letters; commonly heard transmitting groups of three or five figures. Outside of the maritime service, other transmissions use three letters plus a number, eg UHF3, REJ60 etc. Whilst naval and military use three letters, ie UMS, UMV, exception being UHF3! The figure 4 in non-cypher traffic has a different meaning than that used by UMS. A Russian beacon using CW can be heard on 20.992.5MHz using letter F ... audible in late evenings. An average transceiver overlaps enough to cover this frequency. Any interested observer can obtain a copy of 3rd Register Cyrillic Shifts plus ID numbers from me.

IARU Monitoring Service - April 1991

Date	Time U/TC	Frequency in MHz 'M' or 'E'	Callsign if Heard	Mode	RST	Logs X	Details of Traffic if Known Any any Other Information
300491	1220	7002	V	A1A		20	Bcn cud be navigation safety Vladivostok USR
2904	1231	7040.5		A1A			Grps figs & ltrs (A7YT 22 etc)
3004	1218	7079.8		A3E		2	B/c fmale Indian type music
0804	1212	14004		F1B			RTTY 500Hz/75 encoded
230391	0642+	14023+		F1B		30	24hr stn/250Hz 3rd register USR
0704	0950+	14032		P0N		2	"motor boat"
230391+	1210+	14048+		J3E/A0		27	Radio Tele + Tones
do	0925+	14058/62		A2?		37	24hrs stn dual transmx
270391	1200+	14070++	VRQ	A1A	599	42	ext to 14102/csigns like NPO
2303	1140+	14140.5	UMS	F1b/A1a		23	ID in CW at end fig Blks USR
290391	0905	14185.5		F1B		5	Also F7B mostly 250Hz RTTY
2303	0905	14211.5		F1B		24	250Hz QSYd to 14215 on 130491
2303	1150	14217.5		F1B		4	RTTY 250Hz also N0N
280391	0640	14217.5	UMS	F1 CW		3	F7B + fax data & pips!
2903	0750	14217.5	UMS	F1B		18	Naval Radio Moscow USR
240491	1218	18070		A3E			B/c music & talk
2303++	0120++	21032	UMS	F1B		22	USR Naval rad/also A1A
0804	0150	21032	UMS	???		3	Mode unknown + fax
0940++	0540	21032	UMS	F1B		24	Naval Radio Moscow USR
2303/29	0940+	21283.5	UMS	F1B		39	RTTY 250Hz 3rd reg as above
2303/29	1030+	21347.5		F1B		38	250Hz Wx fax + RYs
120491	0420	21445	R Moscow	F3			News in English USR
0304	0845	28515	???	A3E		9	B/c in Jap/Rus "East is Red"

Many B/c stns still being heard on the 10m band, also on 21, 14 & 28 we are hearing P0N signals much more; our new breed of "woodpecker" is OTHR.

Reports this month from VKs 2PS, 2EYI, 3AMD, 4BG, 4DD, 4AKX, 4BXC, 4BTW, 5TL, 6RO, 6XW, 6BWI and 7RH. Many thanks. ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

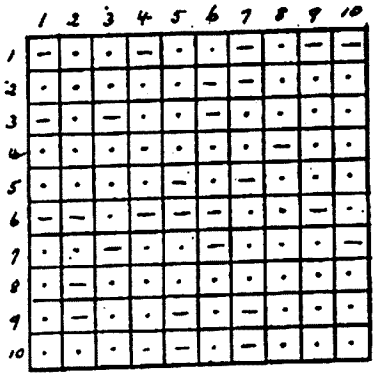
*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 52



Across: 1 tidy; 2 sews; 3 case; 4 heel; 5 sale; 6 matter; 7 fast; 8 lies; 9 rents; 10 sari.
Down: 1 kites; 2 sing; 3 fib; 4 dues; 5 sweat; 6 pats; 7 grew; 8 iris; 9 base; 10 bits

TRADE PRACTICES ACT
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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Caulfield South, Vic 3162

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.....

Call Sign (if applicable): .....

Address: .....

.....

.....

State and Postcode: .....

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VK2	PO Box 73 Teralba NSW 2284
VK3	Inwards - GPO Box 757G Melbourne Vic 3001
	Outwards - 38 Taylor St Ashburton Vic 3147
VK4	GPO Box 638 Brisbane QLD 4001
VK5	PO Box 10092 Gouger St Adelaide SA 5000
VK6	GPO Box F319 Perth WA 6001
VK7	GPO Box 371D Hobart TAS 7001
VK8	C/o H G Andersson VK8HA
	Box 619 Humpty Doo NT 0836
VK9/VK0	C/o Neil Penfold VK6N
	2 Moss Court Kingsley WA 6062

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If the item is carried by your Divisional Bookshop, but is not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
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AMATEUR RADIO

AUGUST 1991 RRP $3.25

THE WIA RADIO AMATEUR'S JOURNAL

AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Evan Jarman VK3ANI
Peter O'Connor VK4KIP
Gil Sones VK3AUI
Phil Steen VK4APA
Roy Watkins VK6XV

DRAFTING
Vicki Griffin VK3BNK

MARKETING
Bruce Kendall VK3WL
Norm Eyres VK3ZEP

ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
(03) 523 8191
Fax: (03) 523 8191
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Cover

The Compleat John Moyle contestant! Ron Fisher VK3OM comfortably in harmony with the birds and the bush. The rigs are Yaesu FT7 and Kenwood TS120V running about 12W. The "Rononymous" Z match is also represented feeding a 40m dipole fed with 300 ohm open wire line. The solar panel supplies about one amp charge to the battery. Photo by XYL Lynette Fisher.

EDITOR'S COMMENT

Graham Thornton VK3IY Managing Editor.

The very erudite Bill Rice VK3ABP is a hard act to follow in this column. He and XYL Margaret are currently enjoying a well-earned holiday touring VK4, 5 and 8. All sins found in this issue rest squarely on my shoulders!

Bill will be sorely missed at proof reading time. His eagle eye can spot a split infinitive at ten paces! My trouble is, I don't really know what a split infinitive is; I hope I don't use one here.

Our joint efforts are directed to giving you, the reader, the best possible magazine our resources will allow. We are conscious of the fact that it is YOUR magazine - not ours. It often faces comparison with commercial publications. This is comparing apples to oranges. They are free to adjust their content to maximise readership appeal; they can choose a market of their own. We can not.

AR is a membership journal and, as such, it must serve the needs of our members. Amateur radio, as a hobby, contains a wide divergence of interest, and our journal must cater for minority groups within it. It might perhaps be said that the magazine is the glue which holds the WIA together.

The most important person in the production of the magazine is the contributor. Without a constant supply of material, we would have nothing to publish. If it takes some time for your article to appear in print, please bear with us.

On reading the book QTC, recently reviewed in these pages, I was delighted to learn of my distant relationship to the late Gugliemo Marconi, via his first wife Beatrice. It's rather nice to let this drop occasionally, in the course of casual conversation! An Italian restaurant had to be patronised to learn the correct pronunciation of his first name.

I would like to express my thanks to all who give invaluable help in the production of the magazine.

Ron Fisher VK3OM and Jim Payne VK3AZT both travel considerable distances to help out on proof reading day.

Micki Horton, of *Magazine Graphics*, performs a skilful service with her magic fingers keying-in almost the entire text of the magazine; with her keen editorial eye, she has rescued us many times from our own oversights.

I am grateful to Bill Roper VK3ARZ and the Executive Office staff for their assistance and encouragement.

Vicki Griffin's excellent drawings would stand comparison with those of any other magazine.

Well, as Uncle Gugliemo used to say.....

73 for now.

ar

Gladesville/Aussat Tests

The third test transmission was scheduled for 24 July last.

For the remainder of this year tests have been scheduled for the end of September and November. Your local Divisional broadcasts will advise details.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

Registered Executive Office of the WIA: 3/105 Hawthorn Road, Caulfield North, Vic, 3161

All mail to: **PO Box 300, Caulfield South, Vic, 3162** Telephone: (03) 528 5962 (03) 523 8191

Fax: (03) 523 8191 (Non-dedicated line)

Business Hours: 9.30 am to 3.00 pm on Weekdays

General Manager and Secretary: Bill Roper VK3ARZ

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Vice Chairman:	Ron Henderson	VK1RH	**VK2 Federal Councillor:**	Terry Ryeland	VK2UX
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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

WIA to Administer Amateur Exams

It is now some years since DoTC first discussed withdrawing from the administering of AOCP, LAOCP and NAOCP examinations. Members with long memories will recall discussions in the 1970s, proposals in 1984, and the costing of examinations in 1985 followed by the first concrete moves to devolvement in 1987.

Finally, in 1990, the devolvement of examinations became a reality and, in a number of places, examinations became a little more freely available. However, many of those who took on the tasks of administering the devolved examination system found it somewhat less than ideal and an increasing number of complaints began to be received by both DoTC and the WIA.

DoTC has now decided to substantially reduce its involvement in the day to day running of radio amateur examinations as from 31st December 1991, however, DoTC will still be responsible for granting exemptions, and providing and conducting examinations for persons having disabilities.

Negotiations between DoTC and the WIA have resulted in the WIA being granted permission to set and administer virtually all amateur radio examinations throughout Australia as from 1st October 1991 (this overlap is to allow an orderly phasing in of the new system and a phasing out of the old system). Understandably, DoTC will retain responsibility for the standard and content of amateur examinations, and will audit the management of the examinations by the WIA from time to time.

This is a major step for the WIA, and for the radio amateur service in Australia, but the new arrangement will solve many of the problems which have developed in the present system.

The philosophy, principles and mechanics of how the WIA will manage this new arrangement are still being finalised, and full details will be released in coming weeks.

Copies of *AR* articles

Photocopies of any article published in a back issue of *AR* available to members at $2.50 each (plus $2 00 for each additional issue in which the article appears)
AR Articles
PO Box 300
Caulfield South Vic 3162

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570 MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2YEL VK2AOE	From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only): 1.845 AM; 3.595 AM morning and SSB evening; 7.146 AM*; 10.125 SSB; On relay 14.160 SSB* and 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; On relay 584.750 ATV sound; 1281.750 FM. Plus automatic relays to 2m repeaters surrounding Sydney and manual to several country repeaters. News headlines by phone (02) 552 5188.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK4ER VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland - Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

However, the main features will be:

* WIA Exam Service, operating from the WIA Executive Office in Melbourne, will promptly provide quality, consistent standard examination materials to accredited examiners anywhere in Australia to enable them to conduct examinations as required.
* Any team of two licensed radio amateurs, or other responsible members of the community, regardless of whether or not they are members of the WIA, will be able to become accredited examiners. Amongst other things, the eligibility of other responsible members of the community to conduct exams should enable most candidates in remote towns to sit exams locally even though no radio amateurs are available.
* No prior advice to WIA Exam Service as to the time and place of an exam will be required, except under exceptional circumstances. This means that, as soon as the examinations material is received from WIA Exam Service, the examination could be conducted at any time mutually convenient to the accredited examiner team and the candidate(s).
* Candidates will be allowed five or ten minutes, depending on the particular examination, to read the examination paper immediately prior to commencement of the examination.
* Accredited examiners will be able to correct examinations immediately they are finished, and hand results in writing to the candidates. Naturally, for Morse sending examinations this will apply only where an examiner has the appropriate Morse qualification. All Morse sending exams will be tape recorded.
* Certificates of examination passes, which will be accepted by DoTC for issuing of Amateur Certificates of Proficiency or confirmation of fail marks, will be mailed to the successful exam candidates by WIA Exam Service within days after the exam.
* Costs of exams from WIA Exam Service will be minimised and will be based on a realistic cost-recovery basis. Accredited examiners will be able to set their own examination fees to candidates, over and above the WIA Exam Service basic cost.
* The WIA will immediately begin work on revising the present question banks, and substantially increasing the number and range of questions.

US Technician Licence

A brief note from the ARRL newsletter for 30th May 1991 states that since the codeless Technician class licence was born on February 14th more than four thousand new United States of America amateurs have qualified for this new class of licence.

50 MHz Input Required

The Chairman of FTAC, John Martin VK3ZJC, highlighted in his notes in the July 1991 issue of Amateur Radio magazine, the need for input to the Federal review of 50 MHz beacon policy. Active beacon users and others interested in 50 MHz are urged to read John's comments and drop him a line as soon as possible stating their ideas.

Remembrance Day Contest

Yes! It's that time again. The 1991 Remembrance Day contest will take place over the weekend of 17th - 18th August. Full details and rules appear in the Contests pages of this issue of Amateur Radio magazine. Please note that this year there is a change to the requirement for submitting logs. Only a summary sheet is needed.

RF Tag Identification (RFID) Systems

For some time the WIA has been in communication with DoTC about the proliferation of these devices and their potential to cause interference to other spectrum users. As a result of WIA submissions a permitted maximum operating field strength of the radiated signal has been established.

A recent letter from Mr G. Hutchins, Director Spectrum Planning Section of DoTC assures us that the Department is considering the overall management of these devices. His letter included the following:

Low-powered devices must operate on a no interference, no protection basis. A low powered device that causes interference to any primary, permitted or secondary service will be required to cease operation immediately. In addition, operators of a low powered device must accept interference from other users.

as well as:

The Department does not intend to develop a low powered device standard. The regulatory measures proposed and those already in place will collectively meet the objective of a standard, viz to control the potential of these devices to interfere with other users of the spectrum.

New DXCC Country

The addition of the Penguin Islands to the DX Century Club list brings the total to 323 "countries". The Penguins are a group of thirteen islands situated off the coast of the west African country of Namibia, and claimed by South Africa. There have been two recent operations from these islands, in July 1990 and in December 1990.

1992 Australian Radio Amateur Call Book

The Executive Office of the WIA is preparing for a busy season with the run up to the publication of this new edition of the Call Book. Members can help reduce the load a little by ensuring that all the information held here is correct and in the desired format.

If you were dissatisfied with your listing last year, now is the time to notify the office of your correct details. The information about members is taken from the WIA membership records, but for non-members the only information we have is what comes from DoTC, so please check with DoTC that they have the records correct.

Any requests for suppression of addresses or names MUST come to the Executive office in writing.

Each year after the Call Book is published we receive letters from readers notifying us of changed callsigns, or deceased amateurs of which we have not been informed, or of typographical errors that have slipped through. If any of those assiduous readers wish to contribute to the accuracy of the publication by helping with the proofreading BEFORE the final printing, they will be most welcome.

A telephone offer to the office will allow us to notify you when the proofs are available for checking.

Amateur Radio Magazine

A magazine such as *Amateur Radio* carries a range of articles that do not always fit neatly into a page or half page. Most readers will have noted that there are occasional spaces of a few lines that are "filled" as necessary. These spaces make ideal spots for

business card size advertisements, and the editorial staff are always happy to receive such advertising.

However, they could also be used for short hints, comments or ideas from members. If you have a favourite short cut, building hint or operating practice that can be explained in a few lines, the Editors would like to hear about it, and many members may be interested to try it.

Co-operation With NZART

Over the weekend of 31st May - 3rd June 1991 Ron Henderson VK1RH and Brenda Edmonds VK3KT, representing the WIA, attended the New Zealand Annual Conference as guests of NZART. Ron's report to Executive will be available from Divisional Councillors on request, and Brenda has reported briefly in the Education Notes on the aspects of education, examinations and devolvement in New Zealand in comparison with Australia.

Both WIA delegates noted the similarities in the issues raised - membership drives, funding, corporate planning, and Morse code to name a few - although some of these problem solving methods differed. It was agreed that there are many projects on which the two societies can share both the work loads and the benefits. The WIA and the delegates would like to express their thanks to NZART for their hospitality, the warm welcome and the open discussion on a wide range of topics.

Quarterly Federal Meetings

July 20 and 21 see the first quarterly meeting of Executive and the Federal Council since the Annual Convention. Special items on the Agenda include a draft submission on examination protocol, an assessment of the DoTC Regulations, which is to be undertaken at the suggestion of DoTC in an attempt to increase the deregulation of the amateur service, and FTAC submissions on repeater licence conditions and usage of 50 MHz.

The outcome of these meetings will be reported in future Federal News Tapes and Amateur Radio magazine WIANEWS columns.

DOC 70, 71 & 72 Are No More

The regulations' brochures DOC 70, 71 and 72 have again been reprinted by DoTC, but this time will be known as RIB 70, 71 and 72. The RIB stands for Radiocommunications Information Brochure.

DoTC Investigates

Items relating to usage of amateur bands by non-authorised services are often reported to the WIA by members. Two such instances have occurred lately. Two separate correspondents notified the Executive Office of a Western Australian fishing fleet base station operating on 3796 kHz USB. Consultation with DoTC revealed that the station had originally been issued with that frequency in error, but the licence had later been cancelled and a new one issued in the 4 MHz band, with a short change-over time allowed. As this time has now expired, the licensee will be contacted to remind him of his now illegal operations.

Another correspondent recently brought to our attention an advertising brochure showing an irrigation sensor claimed to transmit on 29.1 MHz. This was also mentioned in a letter published in "Over to You" in the June 1991 issue of Amateur Radio magazine.

The matter was raised with DoTC late in May. The response received from the Manager Licensing, David Hunt states:-

"We have investigated the matter and it appears to be simply a misprint in the brochure. The device involved has a type approval certificate (copy attached) and actually operates on 29.71 MHz. The company which sells the device has reprinted the brochure and removed the reference to operating frequency."

Amateur Radio Address Labels

In the March 1990 issue of Amateur Radio magazine, it was explained how to read the information on the address label of your mailed copy of the magazine. Since then, we have found that there was some confusion among those members who had paid three-year subscriptions. Our computer experts have now succeeded in reorganising the information so that the month and year when the renewal falls due are now shown.

The top line of your address label now reads, from left to right, month/year of renewal, WIA Division, Grade of membership, callsign or listener number, and date of that issue of the magazine. Here is an example:

04/92 3F VK3XYZ 234567 0791

This label top line shows that WIA membership is due for renewal on the 1st April 1992, the addressee is a member of the Victorian Division, holding a full grade of membership, with the callsign VK3XYZ, and a membership computer database number of 234567, and this label is to address delivery of the July 1991 issue of Amateur Radio magazine.

Please note that the computer database number is different from the one that appears on your WIA membership certificate. On this line of information, the first number will change after your renewal is received, and the last number will change with each magazine issue.

Please also remember that any changes in your address or callsign information should be notified to the Executive Office as soon as possible, preferably on the appropriate section of the fly-sheet.

EMI Standards

The June 1991 issue of "The Australian Standard", an official publication of Standards Australia, announces that:-

"Standards Australia has published a new edition of the Standard (AS1044) which deals with electromagnetic interference from household appliances. This new standard differs entirely from the early Australian philosophy and is identical to the international Standard (IEC/CISPR 14). Australia's electromagnetic interference (EMI) Standards are now all completely aligned with the corresponding IEC/CISPR publications, the only variations being those essential to Australian conditions, eg protection of air navigation frequencies not used by other countries."

The same issue notes the preparation of an Interim Standard for electronic ballasts, including those associated with the new generation compact fluorescent lamps, reflecting the revised harmonic current limits.

Australian Science in Schools Week

The Executive Office has recently received inspection copies of the newly released booklet "Communication", which has been produced by the Australian Science Teachers Association as the basis for the annual "Science in Schools Week", to be held this year from 19th - 23rd August.

The booklet provides ideas for experimentation and investigation by students at upper primary or secondary level. It covers a creditable range of communication methods including, of course, radio, television and satellites (although it does put Morse code in the chapter titled "Communication using wires").

This information is passed on, partly to give credit for a local production, but mainly because it advises students to invite amateur radio operators to visit schools, or to contact the WIA and radio clubs for information. So be prepared for a rush of inquiries in mid August. I am sure you will be as helpful as possible.

Some clubs or amateurs, knowing about the project, may like to take the initiative and contact the schools first. Names and addresses of State Co-ordinators of the Science in Schools Week can be obtained from the Executive Office.

WICEN Needs New Operators

Even though one in sixteen licensed amateurs in Australia belongs to the Wireless Institute Civil Emergency Net (WICEN) more are needed. WICEN especially needs to find competent, practising amateurs in country towns and in the more isolated places and remote areas of this large country.

The recent spate of floods in NSW and Queensland proved yet again how much WICEN is needed, but the response time was slow because WICEN had little or no contact information on amateurs in the affected areas. Belonging to WICEN is not a large financial burden and the training is very easy. This training is more to familiarise you with what the other services will do rather than on radio and technique.

WICEN needs people who are prepared to put in to assist their Community in times of need. Do you fit this description?

If you can help or would like further information please contact your WICEN Co-ordinator through your WIA Division, or join in on any of the Divisional WICEN broadcasts. Further information is also available from the WICEN BBS on (03) 802 0913.

Sign up a new WIA member today - use the form on the reverse of the *AR* address flysheet

More TVI Potential?

A quote from the DoTc Newsletter of June 1991 reads:-

"The 35th year of television in Australia has seen the number of television transmitters pass the 1000 mark. As well as the well-recognised main station transmitters, which serve major population centres, the number includes translator stations which make television services available to people in areas beyond the coverage of the main stations."

Reciprocal Licensing in Japan

A recent letter from the Japanese Amateur Radio League (JARL) advises of increased application fees for the amateur service, as follows:

Initial applications:
10 watts or less
11,300 Yen
More than 10 watts, but 50 watts or less
14,300 Yen
More than 50 watts, but 100 watts or less
21,600 Yen
Renewal.
3,650 Yen

The idea of paying according to the power rating is an interesting concept.

When seeking a reciprocal licence in Japan, amateurs are advised to apply through the JARL, who will translate the documents and submit the application to the licensing authority. Further information is available from the WIA Executive office.

International Representation Fund

Donations to this important fund received and not previously publicly acknowledged by the WIA include those from:

Paul Clutter
Adelaide Hills Amateur Radio Society
Ron Churcher VK7RN
R. K. Howrie VK6ANR
M. G. McCulloch VK2BMZ

In this time of very high expenses for international representation of the amateur service in Australia, the WIA extends its thanks to all contributors.

New Award

A letter from the VK3 Midland Amateur Radio Club announces the establishment of their new Golden Triangle Award. The award Net is run on a Thursday night on 3580 kHz at 8 pm local time, the Net Controller being Judy VK3NYL.

In order to achieve the award, it is necessary to work at least 25 towns within the Midland Amateur Radio Zone. A list of the towns is available on receipt of an 8" x 5" SASE from *"The Awards Manager, Ron D. Mitchell, VK3JNR, C/o PO, Malmsbury, VIC. 3446."*

US Proposals for WARC 92

The ARRL Newsletter of 27th June 1991 lists the Federal Communications Commission (FCC), the USA equivalent of the Australian DoTC, recommendations for the US proposals for the 1992 WARC.

In summary, the proposals include movement of the amateur allocation in the 40 metre band and expansion of the HF broadcasting bands with the phasing out of AM in favour of reduced-carrier SSB.

The FCC did not support the reduction of amateur allocations in the 80 and 40 metre bands, or the re-allocation of the 420 - 421 MHz band for use by low-earth-orbiting mobile satellites. There are also proposals for variations in the 2300-2450 MHz band.

Amateur Radio for the Olympic Games?

The same newsletter noted that the organisers of the World Radio Sports Federation (WRSF) are planning an international program of on-site radiosport competitions. Rules are being established and national and local organisations are being encouraged to develop such events. Ideas and proposals are welcomed, and inquiries may be directed to John Crovelli W2GD, 200 Woolf Rd., Milford, NJ 08848, USA.

VNG 16 MHz Time Change

Marion Leiba VK1VNG has advised that the VNG time and frequency service transmitting on 16.000 MHz has changed its times of operating. Transmission on this frequency now takes place from 2200 to 1000 UTC daily.

The other VNG transmissions on 5.000, 8.638 and 12.984 MHz remain transmitting continuously.

Speech identification by Graham Conolly VK2BL takes place on the 5.000 and 16.000 MHz transmissions only during the 15th, 30th, 45th and 60 minutes of each hour. These recorded speech announcements are *"notched"* to ensure that the second markers can still be heard. **ar**

"Handybridge" Impedance Bridge for HF

DREW DIAMOND VK3XU
"NAR MEIAN" GATTERS RD
WONGA PARK 3115

OFTEN THE RADIO AMATEUR or experimenter will need to know the value of an impedance, especially in antenna and feedline work. A signal source (TX) and SWR meter can only show deviation from the working impedance (usually 50 ohms) in terms of SWR, and gives little idea as to the actual value of the impedance.

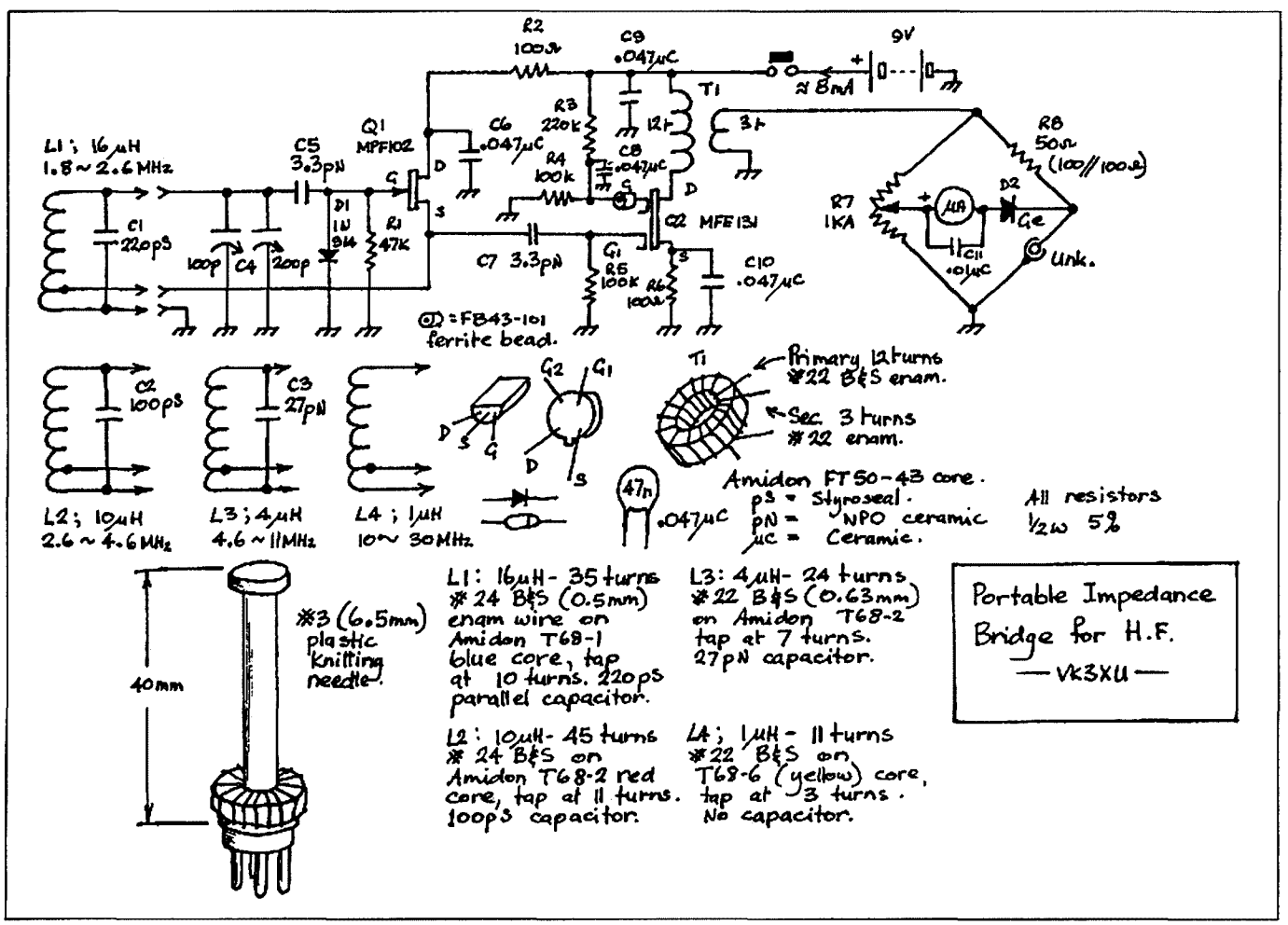
This bridge has at least three functions; it can measure resistive impedances from about 10 ohms to 600 ohms over 1.8 to 30MHz, provide an HF oscillator signal source, and can be used to find the value of small coils and capacitors. For convenience, the signal source is built-in, so the need for a separate oscillator is avoided. It is hoped that the following arrangement will provide easier measurements, particularly in awkward or remote applications.

All parts are available at present. A deliberate choice was made to use ordinary tag strip, larger components and aluminium box construction to stimulate those enthusiasts who are perhaps discouraged by projects which use a printed circuit board and tiny components.

Circuit

The measuring element is based upon the classic and oft-used Wheatstone bridge. When the 1000-ohm linear pot R7 is at mid-travel, and the unknown (UNK) connector is terminated with a 50-ohm resistive impedance, the circuit will be "in balance" and no potential exists across the detector. Values other than 50 ohms will cause balance at differing positions along the travel of the pot, and may be read or interpolated after suitable calibration.

The signal is supplied from a Hartley oscillator maintained by Q1, an N-channel junction FET, then buffered and amplified by Q2, a dual-channel MOSFET. Broadband transformer T1 converts the



high-impedance output at the drain of Q2 to a low-impedance source to drive the bridge circuit.

Frequency band changing is accomplished with a set of four plug-in toroidal coils to cover 1.8 to 30MHz. Bandswitching was tried, but bothersome dips and peaks were caused by resonances with unused coil/capacitor combinations in close proximity. The usual way of tackling the problem is to short out any unused coils but would require a special switch of a kind not readily available. To avoid excessive frequency variations, the coils are plugged into a socket mounted within the box, thus shielding the coil from hand capacity and air draughts.

Construction

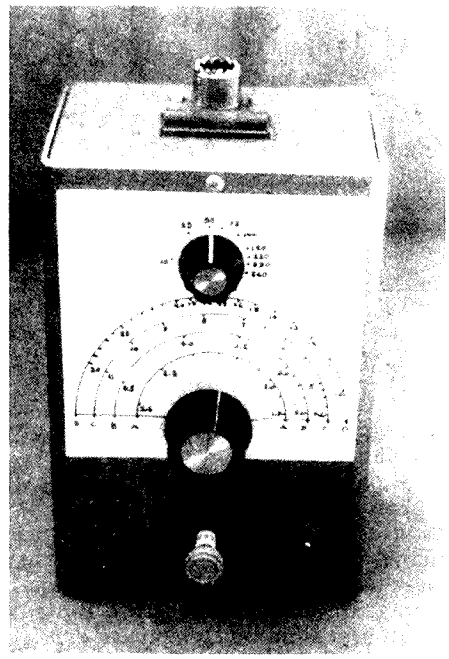
The box shown housing the bridge is a Horwood number 34/6/DS measuring 100mm x 155mm x 75mm. In order to accommodate a reduction drive for the variable capacitor, a small "sub-chassis" is fitted inside the box as shown. This approach also permits short leads in the Wheatstone circuit, and the aforesaid coil arrangement.

The photo shows a suggested wiring method using tag strips. Most electronics shops can supply these. Lead lengths should be as short as is reasonably practicable.

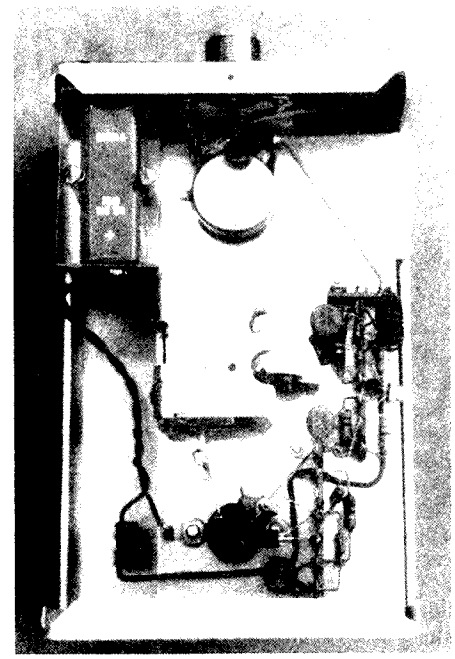
The capacitor should be connected to the reduction drive with a flexible coupler. These are impossible to buy new. A fair substitute is to fit a short length of 0.25" i.d. rubber fuel hose connected with fuel filter clips as shown.

Make sure your 1K pot for R7 has a good length of shaft, as there are some dinky little pots around which will not suit this project. Perhaps a scheme similar to the capacitor coupler may be used for a pot with too short a shaft.

The four-pin plugs for the coils are called line or speaker plugs in catalogues. The centre hole (or fifth pin) should be drilled out to take a 1/8Wh or 6BA or 3mm RH screw. Cut 40mm from the tops of four #3 plastic knitting needles. Drill and tap a 1/8Wh (or 6BA etc) hole in the bottom of each.



Handybridge



Component Locations

Wind the toroidal coils exactly as specified, leaving about 40mm of free wire for terminating into the plugs. When winding, as you reach the tap point, pull out about 10mm of wire and twist into a little pigtail loop. It will probably be easier for you to solder a wire onto the loop rather than try to get a loop into one of the pins. As each coils is fitted onto the assembly, do not forget to include the appropriate capacitor. It should be possible to fit the coil wire and capacitor lead into the pin. The coils may be glued on with epoxy cement later when the oscillator is proved working, and the frequency ranges confirmed. The cement will lower the frequency about 0.08 per cent.

The ferrite bead on gate 2 of Q2 is necessary to prevent parasitic oscillation in this stage. It may be held in position with a small bead of wax.

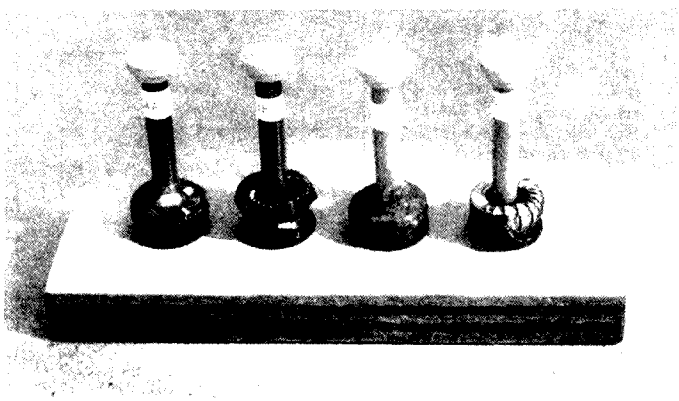
Any small meter of about 200 or 250uAdc will suit the detector. Those commonly available marked "signal" or "tune" are of this sensitivity.

Calibration

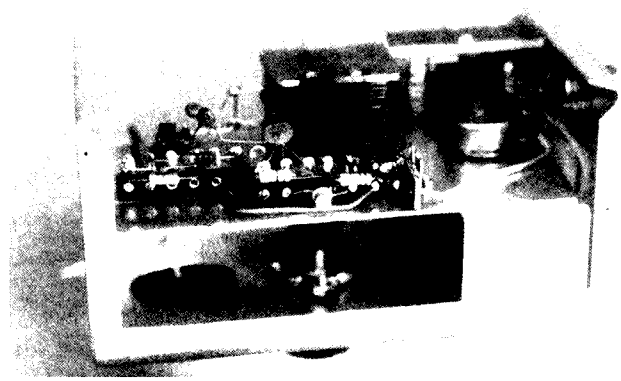
The frequency and impedance scales for the prototype are marked upon a rectangle of firm glossy cardboard with holes cut out for the drive and pot, and held in position with double-sided tape. Before fitting the cardboard, scribe four arcs for the frequency ranges using a fine black pen and compass. They may be labelled ABCD and keyed to the corresponding coils.

If a frequency counter is available, connect the UNK to the counter input and check that each range is generated, with perhaps a small overlap for each. Capacitors F1-C3 may need to be altered

(Continued on Page 9)



Coil Set



Side View

The VK Caltenna

(A CONTINUOUS COVERAGE, 0.1MHz TO 30MHz DUMMY LOAD ANTENNA)

CLIVE COOK VK4CC
PO BOX 161
BRIBIE ISLAND 4507

LIKE MANY OTHERS, I HAVE experienced the thrill and, frequently, the frustration arising from home-brewing, antennas especially, to the extent that a grand total of 46 20m rotary beam have come and gone through my hands, worthy of a book in its own right, I suppose. Nevertheless, despite that interest in gain antennas, I have always been mindful of the need for a simple unity gain antenna which might provide for all-band or even continuous coverage operation. For rapid frequency changing, it is of immense importance that the need for an antenna tuning unit be dispensed with, if possible, to cater for current "leapfrogging" communication techniques.

My first venture into that field was with my discovery that several dipoles could be connected to a common feedline, as explained in the February 1957 edition of *Amateur Radio,* and repeated in the October 1987 edition of *AR.*

An indication of the difficulty in achieving broadband coverage was clearly given by Jerry Hall in the April 1983 edition of *QST.* In his search for a simple broadband 80m dipole, he tested a total of 14 different designs. The best he could manage was a mere 50kHz bandwidth between the 2:1 VSWR points, and this was with a multi-wire cage type.

Now, I'm no wine buff, but surely 1983 must have been a good wine year because, not only was it the year of Jerry Hall's findings, but it was also the year in which I was granted patent rights on an antenna, since marketed as the Black CTW (Coaxial Travelling Wave) antenna. It was also the year in which an eminent Australian communications engineer of the time, the late Ross Treharne, described essentials for broadbanding of antennas in the *Journal of the Electrical and Electronics Engineering Association of Australia,* Vol 3, No 2. Treharne outlined several types of broadband antennas then in use, including shortcomings, not the least of which was erratic VSWR.

Treharne expressed the opinion that, to be truly broadband, an antenna must, in his word, be MONOCARPIC, meaning that energy could be applied once only to an antenna structure, after which any unradiated energy should either be resistively absorbed for conversion to heat energy, or partitioned off and bled to other sections of the antenna. He also held the view that if an antenna could be designed to more accurately match to the impedance of freespace - 120ohms, it would have greater radiation efficiency.

During my more recent experiments, I recalled that I have seen advertisements in US radio journals for passive HF antenna matching units capable of energising practically any length of wire. Prices range from about $600 to $1000, depending on power requirement. For $600 you get a 300-watt PEP unit, so read on, you might save yourself a few dollars, as it is likely that the VK CALTENNA is of similar design but with a better SWR capability.

Lewis McCoy of *CQ* editorial fame was once confronted with a home-brew version of one of those devices and, after later tests, published his findings in the May 1985 edition of *CQ.* Unlike the VK CALTENNA, he did not use a step-up or even a 1:1 matching transformer. He simply connected a 50-ohm resistor at the end of 50-ohm transmission line and joined various lengths of wire to the resistor terminals. He was impressed with results, but generally the dummy load antenna was two points down on a reference antenna. He did suggest wires of

(Continued overleaf)

Handybridge Impedance Bridge for HF

(Continued From page 8)

to provide some overlap if desired. When each range is satisfactorily confirmed, cement the coils as described above.

Mark salient frequencies upon the scale. Do not try to crowd in copious calibration points, as interpolation will provide any missing information.

No counter? Listen for the generator signal on a general coverage receiver. A screwdriver blade inserted into the UNK connector should radiate enough signal to be heard.

Now for the impedance scale. Check that at least half-scale deflection is obtained on the meter (the gain of the buffer amp may be varied by changing the value of R3; increase R3 for lower stage gain).

Obtain a range of small carbon resistors including (say) 10, 27, 51 (or two parallel 100 ohms), 75 (parallel 150 ohms), 100, 150, 220, 330 and 560 ohms. Set the oscillator to 14MHz ad connect the 50-ohm resistor, using a coax connector to suit. You should obtain a null at mid range of R7. Mark this on the scale. Do the same for all desired impedances between 10 and 600 ohms.

Using the Bridge

At this point you may be interested in trying an experimer.t. Connect a coax-fed antenna to the bridge. Set the impedance knob to what is supposed to be the impedance at the station end (eg 50 ohms). Now vary the frequency around the "antenna frequency". How does it look? You may find that the antenna gives 50 ohms at some higher or lower frequency than always supposed. Try checking for 50 ohms at higher frequencies. It is perhaps surprising just how many frequencies will yield 50 ohms resistive.

An impedance with significant reactive component will not allow a really good null to be obtained, so keep this in mind with any measurements.

The oscillator may also be used on the test bench as a generator to supply a few milliwatts at the UNK connector.

To measure coils and capacitors, connect the combination IN SERIES across the UNK connector. As the impedance of a series circuit is low at resonance, set the impedance pot to near zero (or perhaps a bit higher, if the needle is pinning). Now sweep the oscillator around the estimated frequency of the combination. The meter will dip at resonance. It should then be possible to set the impedance pot near zero and obtain a really sharp null. All recent ARRL handbooks have a chart and formula for applying this technique, making use of a standard coil and capacitor of 5mH and 100pF respectively. See also Ref 4.

Problems

There are no perceived pitfalls for the typical constructor. If, however, you have trouble in locating any of the parts, or

(Continued Page 50)

several lengths be used. This is something which might be worthwhile in the VK CALTENNA. He also suggested that it might be capable of being used in directional gain antennas.

An Operational Version

At the moment, I use a 33ft (10m) sleeved aluminium tubing vertical supplied by Black Products Engineering of Brisbane. It sits on a heavy rubber insulating mat and is guyed with polyester ropes tied to a fence and the house. A copper-clad earth spike has been hammered into the ground at the base of the antenna for electrostatic discharge purposes. It does not have any function in the performance of the antenna, neither are radials used or needed.

The actual matching unit consists of a 4:1 step-up transformer trifilar wound with a second winding across which is connected a 50-ohm non-inductive resistor. (See figures 1 and 2).

The choice of a step-up transformer was made using an early idea of Collins Radio wherein the design took into consideration the likely geometrical mean impedance of a random length of wire one quarter wavelength long or more being calculated by the formula - A = B * C where: A equals the geometrical mean impedance of the wire in ohms, B equals the likely impedance of the wire in ohms at a current node (a current minima), and C equals the likely impedance in ohms of the wire at a current loop (a current maxima). Thus, assuming 1200 ohms at the current node, and 50 ohms at a current loop, the resultant from the formula is 245 ohms. This is near enough for practical purposes to my selection of 200 ohms, which seems to work quite well.

With full legal power, a 30-watt resistor has not yet disintegrated, so 50 watts should be an ideal choice for our legal power.

The 50-ohm 30-watt resistor which I use was imported from Japan and, as this might be difficult for others to obtain, I have obtained a 50-watt wire-wound non-inductive resistor, made in Australia, from the manufacturer's agent, St Lucia Electronics of Brisbane, for testing. I have mounted the transformer and resistor in an aluminium box sealed with gasket rubber cement against moisture. Two terminals and an earth wire connecting nut and bolt are incorporated in construction, giving me the option of either end-feeding or centre-feeding an antenna.

I tried to obtain satisfactory results with a transformer wound in the "unbalanced-to-unbalanced" configuration as per Fig 1, without success. Therefore it will be seen that the final choice was of an "unbalanced-to-balanced" configuration as per Fig 2. In one way this is an advantage, as it has enabled me to construct a suitable matching unit for use either as a vertical antenna energiser or for use in centre-feeding a dipole. An eyelet bolt is screwed to the box for that use.

Since this article was written, however, tests undertaken for me by VK2BO have shown that SWR and performance are adversely affected if the VK CALTENNA is operated as either a centre or offset-fed dipole. Best results have been obtained by end feeding, with one end of the transformer left "floating" when using the configuration of Fig 2. The optimum length has been found to be between 32.3m and 36.5m. The wire may also be oriented as an end-fed inverted vee.

I suppose the sceptics are preparing to shoot me down for daring to waste power in a resistor. In reply I can only say that no apparent difference in performance could be observed by several ZL stations I worked when I changed the VK CALTENNA into a conventional quarter-wave Marconi vertical worked against ground on 7MHz. The latter was very much mismatched on other bands, especially on 20 metres, where the base impedance would be expected to be high.

My resolve to intentionally waste some power in that resistor was, as was the objective, to obtain a broadband capability with acceptable loss of applied power.

The 33ft (10m) vertical performs well for me with the SWR being so low that visitors have been tempted to hit the glass of my Oskerblock SWR meter. I have shown them that a Yaesu SWR meter has similar readings to the extent also, of quickly showing the high reading with the feedline disconnected. Readings obtained are as shown in figure 3. A quality antenna impedance bridge verifies that an impedance of practically 50 ohms applies throughout the range of the instrument (1.8 to 35MHz). I am also able to receive numerous M/F homing beacons operating below our broadcast band and can receive every broadcast station within 150 miles (200km) of my station in daylight hours.

JA5AI, who recently stayed with me for several weeks, intends replacing the driven element of his tribander with a VK CALTENNA to provide for rotary dipole action on bands not catered for in the maker's beam design. He started a mini JA-VK contest using his VK4CHH callsign ... you could see he could speak a common language for the JA DXCC SSB seekers. Therefore the VK CALTENNA certainly had a severe workout without causing the 30-watt resistor to disintegrate with up to five hours operation a time.

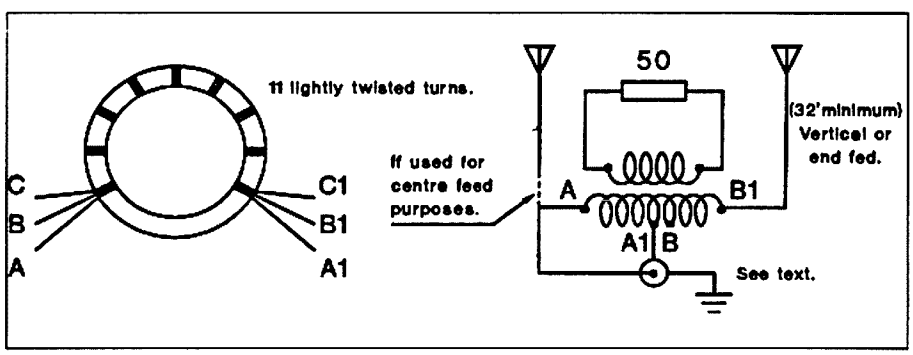


Figure 1. (Inefficient)

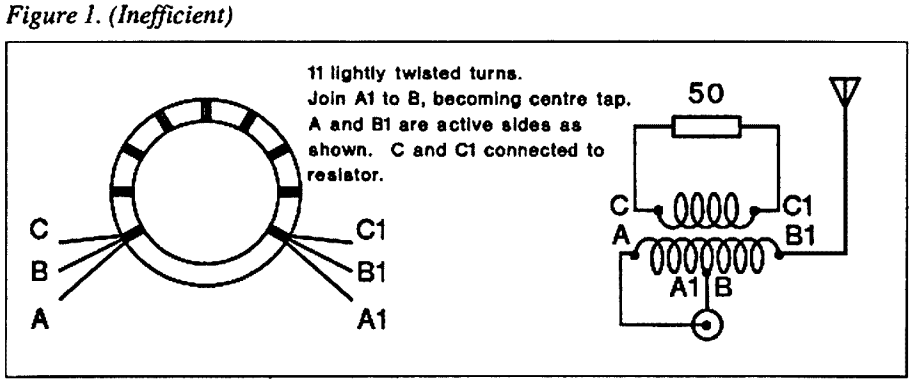


Figure 2. As used on 33 foot vertical.

... and now some additional information

I originally stated that for end-feeding or base-feeding I would have preferred to have employed the "unbalanced-to-unbalanced" toroidal transformer configuration but had not been satisfied with results because of the erratic SWR from band to band. However, I have since overcome the problem by increasing the number of twisted turns from 11 to a total of 22 turns, as shown in Fig 4.

Furthermore, although the original design made use of a 50-ohm non-inductive resistor by using a trifilar winding, I have found that equally satisfactory results may be obtained by the use of a 200-ohm non-inductive resistor in conjunction with a bifilar winding, as shown in Fig 5. A total of 22 turns is still used in this instance, but it should be remembered that windings should be twisted together very loosely to avoid high interwiring capacitive leakage losses at the higher frequencies.

It has been noted that an Australian agent is offering 50-ohm 300-watt non-inductive resistors for only a few dollars. In my case, using a TS430S, no damage has resulted to 30-watt resistors of both types.

For end-feeding a random length of wire, I have had to confine my experiments to an inverted vee, a sloper with some wire stretched off at right angles, and to a 33ft (10m) high aluminium tubing vertical. In all cases, for better all-round performance, from both the communication and SWR point of view, it has been found best NOT to use any earth, radials or counterpoise, all of which have been tried with the vertical antenna and, in part with the inverted vee.

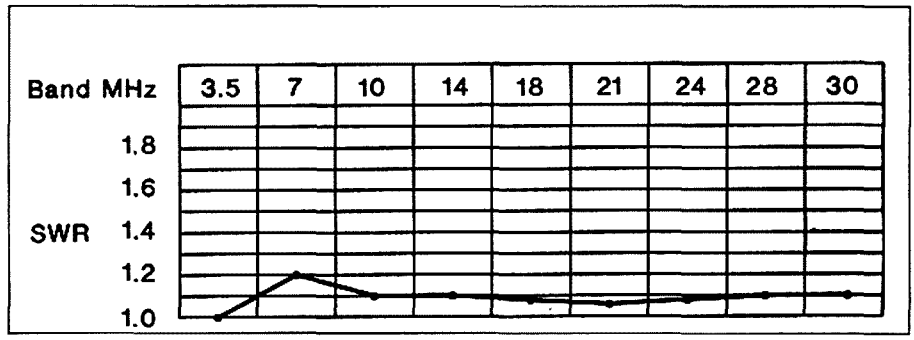


Figure 3 SWR readings obtained using 33 foot vertical.

Earthing the "cold" side of the transformer, other than per the feedline in the shack, results in a horrible mismatch of any length of antenna near that of one quarter wave in length and, to a lesser extent, odd multiples thereof. For example, this results in an SWR of about 2:1 when I use my vertical antenna on 7MHz. Without any earth etc, as stated, SWR is little different from, for example, on 14MHz, where the antenna is then high impedance at the base, being then one halfwave long.

If one uses the "unbalanced-to-unbalanced" transfer configuration SWR will be highest if, for example, it is connected for centre feeding a half-wave dipole. Consequently aim for a length of wire which will be nearer to 3/4 wave long than 1/2 wave long. For all-band operation I found that 51ft (16m) was satisfactory. For end-feeding I suggest experiments with lengths from 90ft (30m) to 110ft (36m).

In all instances, I found that the longer lengths of wire provided for as much as four or more S points on the bands 3.5 and 1.8MHz in comparison to the 30ft (10m) vertical. From 7MHz and higher, the vertical antenna was the better all-round performer, with no directivity problems as with the horizontal types.

I have undertaken experiments using a reflector on 21MHz with the vertical antenna with some very interesting and encouraging results.

I would be grateful for any reports of experiments undertaken with one or more of the variations of the VK CALTENNA, especially if integrated in any beam configuration.

Depending on the response to this I may be unable to personally answer correspondence for which I hope I will be forgiven. Nevertheless, I will gladly discuss matters on air if required, so if you seek a reply, specify date, time and frequency, with alternatives in case I am away holidaying at the time, please.

The name VK CALTENNA? I will leave that for you to put together, VK of course being the country of its origin.

I found that the word CALTENNA was so freely used in the flowing vowel-constant wordage of the Japanese language by JA5AI/VK5CHH in his speech that it seems a good choice for that reason alone. Do not be surprised if you soon contact a JA using one.

ar

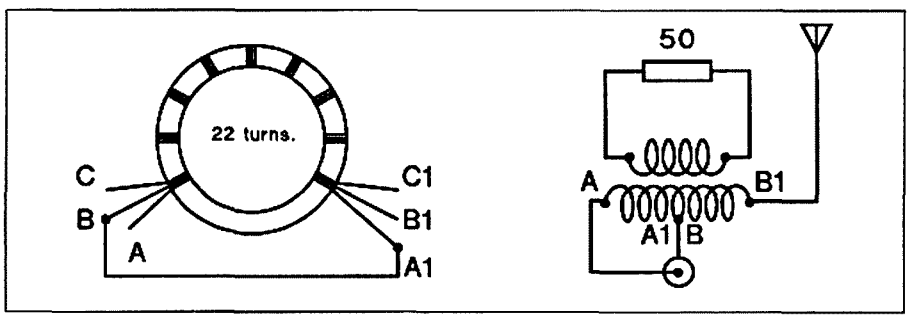


Figure 4. Modified balun

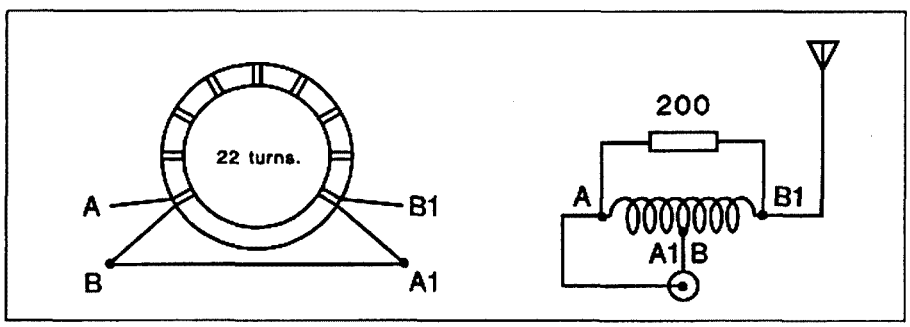


Figure 5. Alternative arrangement using 200 ohms

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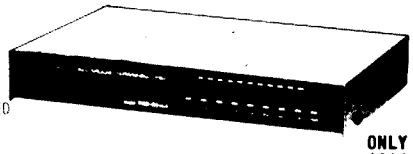

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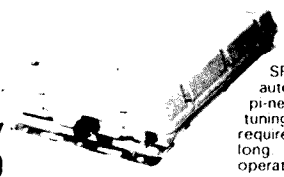

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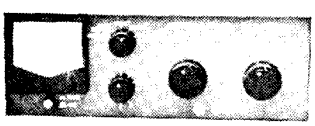

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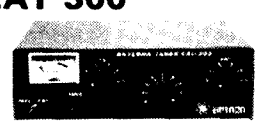

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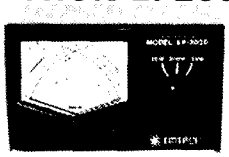

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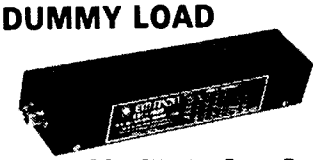

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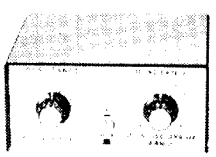

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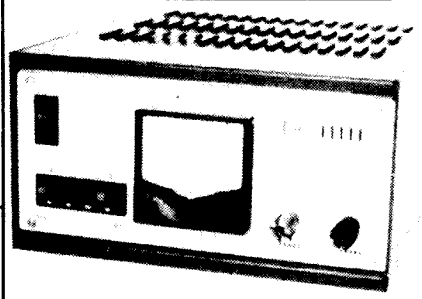

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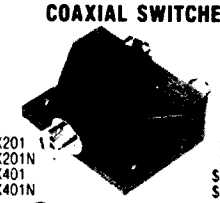

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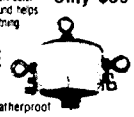

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JOHN ADCOCK VK3ACA
12 ALBERT STREET, OAK PARK 3046

(CONTINUED FROM JULY ISSUE)

Introduction

AT LAST WE COME TO THE purpose of the article. Most of the information in this section came from a book, *"VLF Radio Engineering"* by A D Watt who, in turn, obtained information from many publications by J R Wait. Some information was obtained from *"Ionospheric Radio Propagation"* by K Davis, and a small amount of information from practical experience by the author.

Much of the information given by Watt is literally intended to cover VLF, that is 10 to 30kHz. A certain amount of extrapolation is required to extend the range to the "higher" low frequencies. The methods given in Watt for path loss calculations are based on theory from a knowledge of the physical nature of the propagation paths and processes. Davis gives largely empirical results to calculate path loss, and these seem to depart from those of Watt in some respects. This will be discussed later in the article. It would appear that the general theory of low frequency given by Watt can be applied to frequencies up to 200kHz.

In reading this section, put most of what you know about the ionosphere out of your mind. You will find that low-frequency propagation is quite different.

Before going too far, it should be pointed out that all low-frequency transmissions are vertically polarised only. In fact, it is almost impossible to radiate any horizontal component unless you are transmitting from an aeroplane. Radiation of vertical polarisation was referred to in an earlier article (Ref 3). Some horizontal component can exist in the received signal, and this will be discussed later.

Because the experimental licence issued to several people in Australia was for operation on 196kHz (Ref 3) most of the calculations will centre around this frequency.

Surface Wave Propagation

By now most readers should be fairly familiar with this. At LF, ground loss is very low, and at all low frequencies, propagation can be of significance over distances of up to 500 to 1000km even over poor ground. Although surface wave propagation is dependent on the fairly basic physical phenomenon of diffraction described in section 1, the calculation of path loss depends upon a number of factors. In the words of texts on the subjects, it is easier to calculate path loss from graphs given for the purpose. Graphs for calculating surface wave loss are given in most texts on propagation. For the purpose of discussion, path loss graphs are given here for 200kHz and 1.8MHz (see figure 4).

At all radio frequencies, the surface wave is composed of several components. The most significant waves are direct, reflected and a wave derived from the edge of the wave shadow as described above under diffraction. At LF, the direct and reflected wave (Ref 4) at low angle to the ground are phase inverted, resulting in total cancellation. This leaves only the diffracted wave as the dominant wave. The effect of this is that, as energy is lost from the wave at ground level, wave paths above the loss area tend to bend down to fill in the gap. This bending also affects sky wave propagation, and this will be referred to again in the next section. These characteristics are shown in the general LF propagation diagram figure 5 and in an exaggerated form in figure 6.

Close to the transmitter energy is lost from the surface wave mainly due to induced currents in the lossy ground. Further from the transmitter, in the earth shadow zone, energy is lost as signal energy is fed into the gap. See figure 6. At low frequencies ground losses are low and become lower with decreasing frequency. Also at low frequencies the waves themselves are bigger. This is purely a matter of scale; big waves fill up big gaps better than small waves.

On the practical side, it is obvious from the curves (figure 4) that at 196kHz surface wave propagation is excellent, especially over seawater. For comparison, surface wave propagation is shown for 1.8MHz. This propagation is so good and completely reliable that this factor alone makes LF operation desirable. From the graph it can be seen that a 196kHz surface wave over poor ground can travel up to five times as far as a 1.8MHz wave under the same conditions. When reading this propagation graph please keep in mind that the distance scale is logarithmic.

Ionospheric Propagation

This section will deal with this subject in several basic sections, and at the end it is possible to estimate any path loss as shown in the worked examples.

The Structure of the Ionosphere as Seen at LF

Firstly we will look at the ionosphere

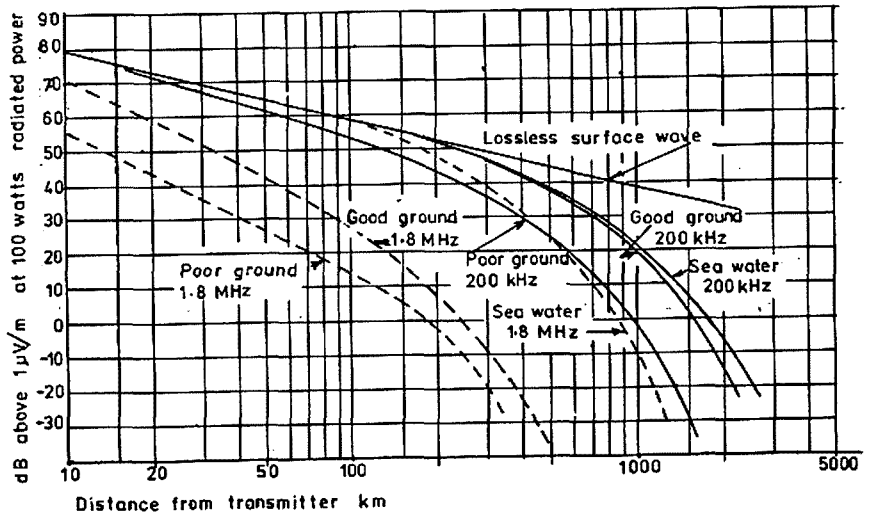

Figure 4. Surface wave propagation, 1.8MHz and 200kHz

without the earth's magnetic field. The upper ionosphere consists mainly of electrons and ionised particles. The atmosphere consists mainly of molecules with few free electrons. Loss in the ionosphere is a function of collision frequency between electrons and molecules. Where the atmosphere and ionosphere meet, a layer is formed which has a high electron collision frequency and, therefore, high loss. This lossy layer, referred to as the conducting layer, contrary to popular belief, is always present. In the daytime it is thick and exists at about 70km above the earth. At night the ionisation in the lower ionosphere is much less and the conducting layer is much thinner and exists at about 90km.

The lossy or conductive layer is like a resistive film across the bottom of the ionosphere. It exists in the region we call the D layer. The D layer can exist as a layer of ionisation but, more usually, it is simply the bottom of the E layer.

At high frequency, the D region is lossy in the daytime and basically prevents long-distance communications below about 10MHz. At night the lossy layer has little effect on high-frequency propagation, at least above 6MHz. Electrons in the ionosphere oscillate as an electromagnetic wave passes through. At low frequencies, electrons move further as each wave passes, causing more collisions. At these frequencies the whole ionosphere becomes lossy to passing waves. The loss is particularly high in the lossy or conductive layer. The D region has no maximum usable frequency in the same way as the E and F layers. The high loss renders it non-refractive and, under normal circumstances, low-frequency waves do not propagate through the ionosphere.

When electrons move through the earth's magnetic field the electrons are caused to spiral. This oscillation of the electrons of the ionosphere resonates at a frequency known as the *"gyro"* frequency. In south-eastern Australia this frequency is around 1.8MHz. The general effect is that it causes some unusual propagation near these frequencies caused by different reflections. That is, reflections at other angles than normal can be emphasised.

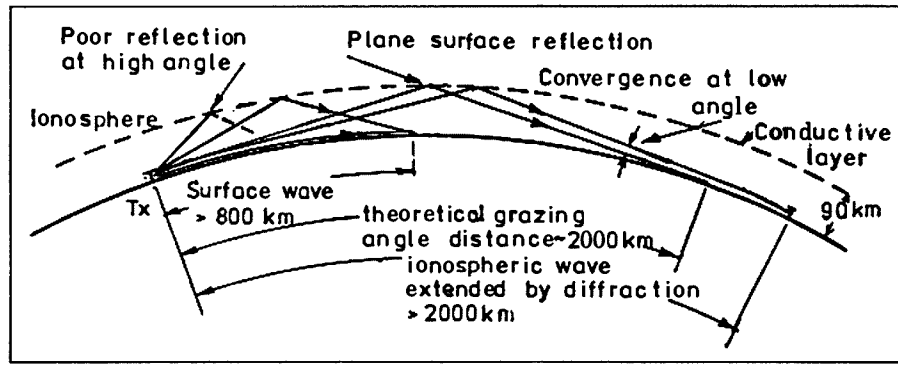

Figure 5. LF night-time propagation paths.

It is a popular misconception that loss in the ionosphere is maximum at the gyro frequency. This is not correct. The texts on the subject state that loss in the ionosphere due to the earth's magnetic field is lower than expected at HF and LF, and higher at or near the gyro frequency. This results in a knee point in the curve of loss/frequency (not shown here) of the conductive layer, but the loss certainly increases with decreasing frequency. There is a second knee or flattening off in the curve at the collision frequency of the electrons and this is around 400kHz at night.

Reflection by the Ionosphere at Low Frequency

With such a lossy ionosphere, how can any reflection take place? Actually an LF signal does not enter the ionosphere at all, but is reflected by the bottom surface. This is plane surface reflection or regular reflection as described above under "basics of propagation". It occurs at the bottom edge of the ionosphere when the conductivity increases with height significantly over a distance of a wavelength. This reflective power of the ionosphere at the bottom edge discontinuity is the same as reflection by the surface of the ground at the discontinuity between the atmosphere and ground.

To return to the optical analogy for LF, the ground and the ionosphere would both appear like sheets of glass with partly silvered surfaces. The top side of the ground and the under side of the ionosphere would poorly reflect light in our analogy perpendicular to the surface, but be quite good reflectors at a low angle to the surface.

The rate of change of conductivity with height of the ionosphere (conductivity profile) is expressed in terms of vertical distance in kilometres ($l1$) over which the conductivity changes by the ratio 2.71:1. For satisfactory reflection at LF the value of this distance, $l1$ is between 0.5 and 3.5km, depending upon the time of day and time of the year. From this value a reflection coefficient can be obtained. The reflection plane is taken as the point where the conductivity equals $1.11 \times 10^{-10} f$ and at 196kHz this equals 2.18×10^{-5} Siemen/metre.

In many ways, this plane surface reflection is much simpler than the type of reflection which occurs at HF. It was known to the ancients. When radio signals were first transmitted across the Atlantic, they exclaimed that there must be a conducting layer of some sort in the sky. The conducting layer behaved exactly as expected with improving reflection coefficient with increasing wavelength. It was this knowledge which brought about the idea that wavelengths shorter than 200m were useless. A statement which amateurs never allow the professionals to forget. Realistically, it did not

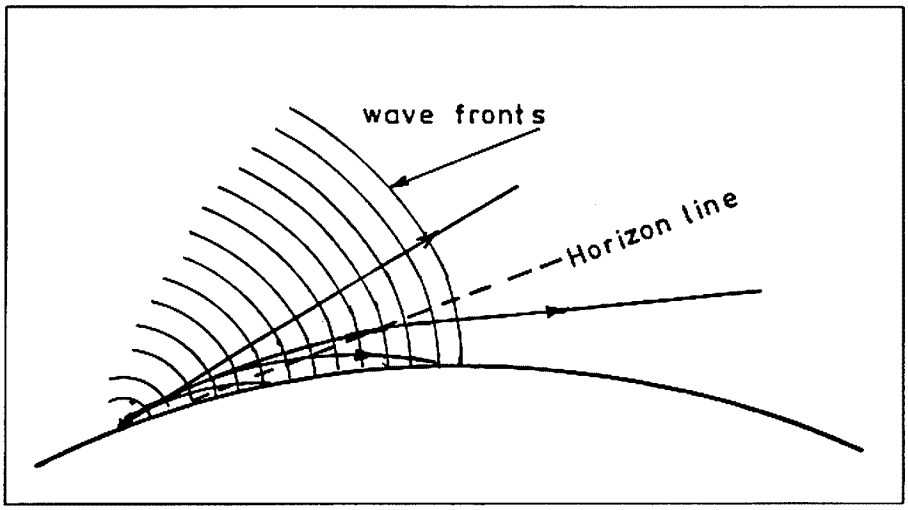

Figure 6. Exaggerated diagram showing bending of wave paths to form surface wave and bending of low angle ray to have a virtual angle below the horizon.

take them long to find out about the true nature of the ionosphere, and between 1920 and 1930 most of what we know now was discovered.

This type of ionospheric reflection which occurs at LF has a number of unique characteristics which are different from that at HF.

1. Since the reflection coefficient is dependent upon the change of conductivity over the distance of a wavelength, the longer the wavelength, or the lower the frequency, the better the reflection down to 10kHz. The reflection loss is minimum at between 10 and 30kHz. Below this frequency, the conductive layer does not have enough thickness or conductivity to maintain reflection. In other words, the first factor of conductivity profile is the limiting factor at the higher frequency end of the LF spectrum, and the second factor of actual conductivity is the limiting factor at the lower frequency end of the LF spectrum. This results in a unique form of ionospheric reflection in the LF band that is different from that in any other part of the radio spectrum.
2. Reflection by this mode is best at the lowest angle and falls off with increasing angle. This is opposite of the situation at the lower high frequencies and medium frequencies where loss is higher at lower angles.
3. Although the ionisation in this region is very low at night, the reflection coefficient is considerably improved at low frequencies, simply because the discontinuity is much sharper and occurs at an increased height. This results in a paradoxical observation that the lower the ionisation the better the reflection. At HF the opposite is true.

Figure 7 gives a graph of reflection coefficient expressed as loss in dB against frequency. The straight line sections of the graphs are based on the formula:

$$20 \log R = .57 f l_1 \cos i \quad (7)$$

where 20log R is the reflection coefficient loss in dB, l1 is defined above, f is frequency in kilohertz, i is the angle of incidence at the ionosphere and R is the reflection coefficient for vertical to vertical polarisation. As with HF, a certain amount of the signal is converted into the opposite polarisation, but this is not detailed here. It will be noted that the log of the reflection loss in dB is simply proportional to the other factors. The vertical scale of the graph is, therefore, double log. For a particular frequency and l1, the loss in dB is proportional to cos i. The graph is correct for a cos i=0.16. This is roughly the cos of the incident angle for a

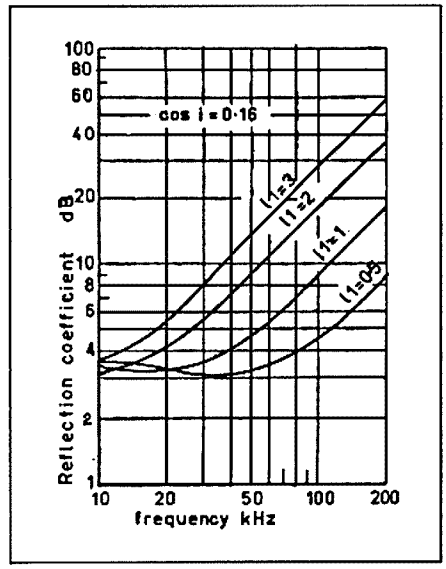

Figure 7. Reflection coefficient 20 log|R|.

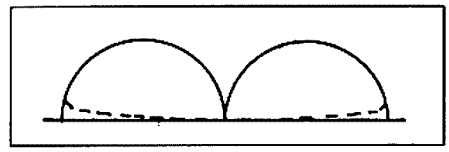

Figure 8. Simplified diagram showing cutback.

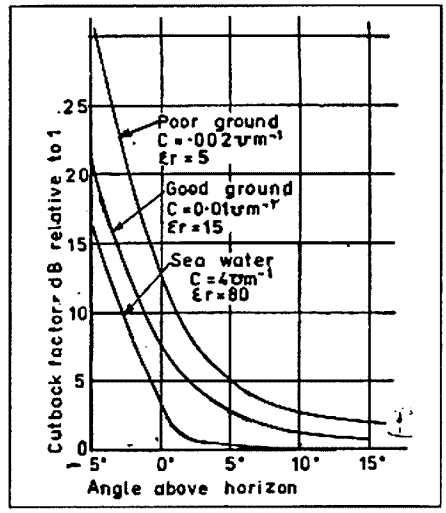

Figure 9. Cutback factor for short vertical monopole at 200kHz.

grazing launching ray. For loss at other angles:

Loss dB=Loss from graph x cos i/0.16. (8)

The value of l1 is variable, depending upon time of day and year (the sunspot cycle appears to have little effect). The value of l1 is usually from .8 to 1.2 at night and from 2 to 3 at midday. In the daytime the value of l1 varies from the night-time value at dawn in a curve peaking at midday. Another significant point to keep in mind is that the height of the reflecting plane is 90km at night and drops quite rapidly to 70 to 75km with daylight. From some actual values taken from observed results at 200kHz and for cos i=0.16 given in Wait, values of 20log|R| are as follows: Night — 12.5, Winter day — 29, and summer day — 48 to 60. These correspond to values of l1 of 0.7, 1.7 and 2.6 to 3 respectively. These are the values which were used for the calculations and accompanying graphs.

Cut-Back Factor and Convergence

These two effects on the received signal strength tend to be complementary and are, therefore, both dealt with in this section.

The radiation pattern for the distant field remote from the ground from a short vertical antenna is shown by the solid lines in figure 8. Since the field strength from a short vertical antenna is proportional to the cosine of the angle to the antenna, then the field strength radiation pattern graph, when plotted on a polar diagram, will consist of semi-circles as shown. The gain of a short dipole is 1.78dBi (1.78dB relative to an isotropic) at right angles to the wire. If the antenna is above a perfect ground, the lower half of the radiated energy will be added to the upper half, and this adds another 3dB. In normal operation on long waves the antenna is always vertical and always short, and, therefore, the gain is always 4.78dBi or three times.

A simple example to clarify this is as follows. The power to an antenna is 100W and the antenna is 1 per cent efficient the equivalent radiated power at right angles to the wire is:

100x0.01x3=3W

Due to losses of the signal to the ground and to supplying the surface wave by diffraction, the lower edge of the radiation pattern is depleted as shown by the dotted line in figure 8. This depletion is well known at HF and is described in all the usual amateur texts on the subject of radiation. At HF, it usually means there is virtually no useful sky wave signal originating from an antenna, either vertical or horizontal at an angle less than 5° to the ground. This characteristic of loss of signal to the ground is known as *cutback*.

At LF, cutback is less than at HF. In fact, as a result of bending of low-angle signals due to diffraction to produce the surface wave, the sky wave path just above is also bent, resulting in radiation at a virtual angle below the horizon. This is also illustrated in figures 5 and 6. Refraction in the lower layers of air also has the effect of extending the horizon at LF in the same way as at HF.

Useful radiation can be expected for a

sky wave path when the wave path originates from the antenna at an angle of -5° and this is enhanced by convergence described below. This results in a considerable extension of the single hop sky wave path, and helps to compensate for the very low height of the reflecting layer. For an ionospheric reflecting layer 90km high, the expected maximum length of a single hop sky wave is about 2000km, but, with the enhancements described, the hop can be usefully extended to more than 2800km.

The graphs for cutback factor at 200kHz derived from information given in Wait are shown in figure 9.

Convergence is a focusing effect and is illustrated in figure 5. Normally signal path rays diverge, but because the reflecting surface is curved, signal path rays are caused to converge at low radiation angles. The gain resulting from convergence at 200kHz is shown in the graph in figure 10. The gain is particularly significant for signal paths just below the horizon, and significantly compensates for cutback. The gain is higher for the second and subsequent hops (not shown here).

Convergence not only takes place in the vertical plane, but also in the horizontal plane resulting from the curvature of the earth. To take the effect to its ultimate conclusion (under ideal conditions), an image of the transmitting antenna is formed at the opposite side of the earth (antipodal position) from the transmitter.

Because of much higher cutback at HF, low-angle convergence in the vertical plane would have little effect. The author has no knowledge of this effect being taken into account in HF calculations.

Reflection From the Earth's Surface After Two or More Hops

How far a low-frequency signal will travel depends very much on the power used and the frequency. At 196kHz, and with amateur power levels and antenna efficiencies, hops much beyond the first would be unusual. If a high-efficiency system is used, multi-hop signal is a possibility and, therefore, ground reflection must be taken into account.

Ground loss at LF is very low. On multi-hop signals ionospheric reflection is likely to be the limiting factor. Loss for ground-reflected signals was originally described by Terman (Ref 5) and has been duplicated in almost every textbook on the subject of propagation. It is not proposed to reproduce a ground reflection loss graph here. The reader can refer to the many texts on the subject.

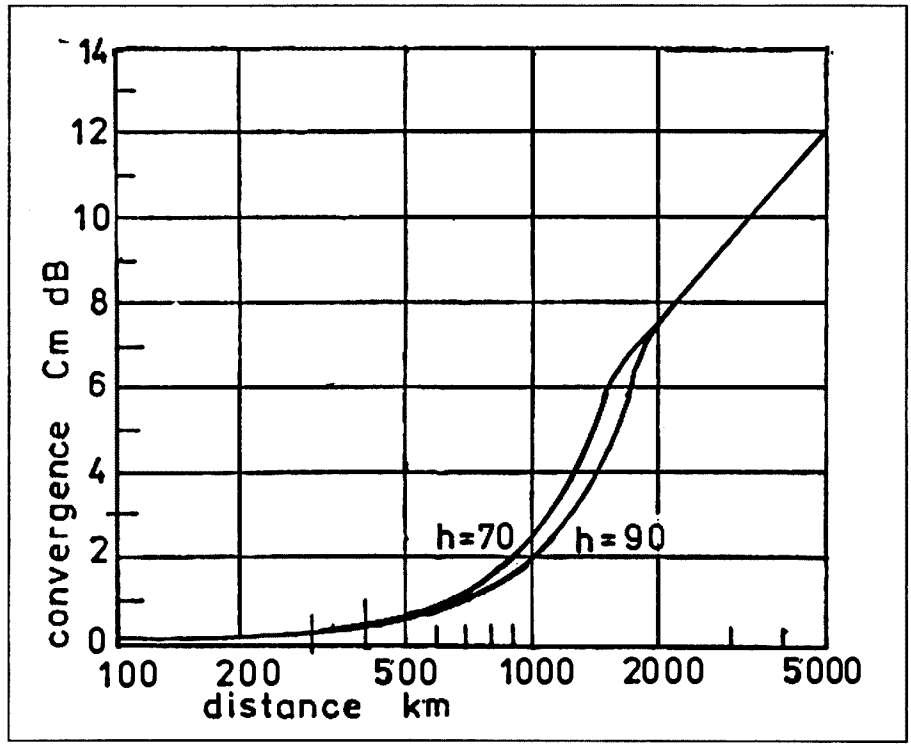

Figure 10. Convergence factor at 200kHz.

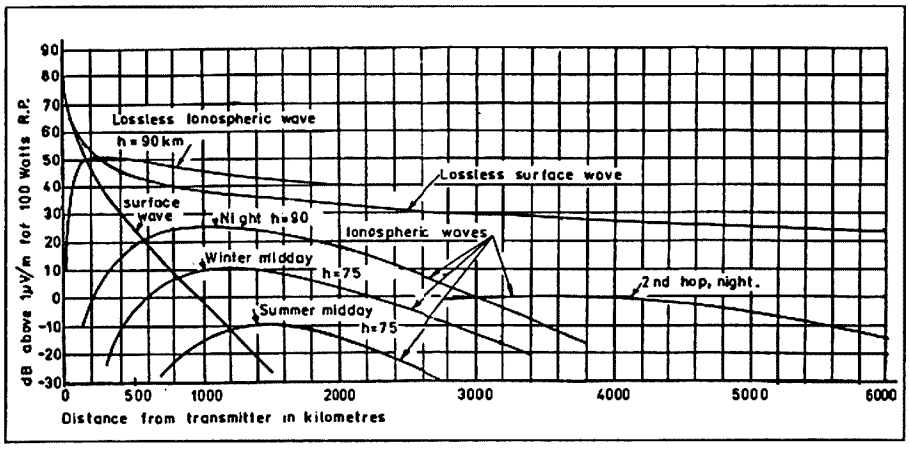

Figure 11. Propagation chart for 196kHz above poor ground

Other Factors in Sky Wave Propagation

The loss in ionospheric reflection is such that only low-angle radiation can be considered. At very low frequencies, loss in the ionosphere is low, allowing long-distance communications.

The loss in reflection from the ionosphere shown in figure 7 is not all total loss. The graph represents reflection of vertical to vertical polarisation. As with HF ionospheric reflection, a proportion of the energy is converted to horizontal polarisation. This is brought about by interaction between moving electrons in the ionosphere and the earth's magnetic field. Horizontally polarised waves are undetectable at ground level due to phase inversion and cancellation. The horizontally polarised component is reflected by the ground and on the second hop some signal is converted back to a vertically polarised signal and adding to the second reflected vertically polarised signal.

The magnitude of both the direct reflected wave (vertical to vertical) and the converted reflected wave (vertical to horizontal) is affected by the direction of the earth's magnetic field and the direction of propagation. These effects are very complicated and won't be considered here, but it is interesting to note that propagation is better in some directions, particularly from west to east.

As well as path loss, it is possible to calculate the relative phase of the signal

along its path. For example, where the sky wave is similar in strength to the surface wave, or where the first hop is of similar strength to the second hop, it is possible to determine whether they add or cancel. This is also not dealt with here, to simplify calculations. It can be considered that, where two paths meet and are of similar strength, the average effect is an increase of 3dB, but complete cancellation with a zero strength is possible.

Calculation of Path Loss With Examples

The calculation of surface wave field strength is as follows:

Ezg[dB above 1μV/m]=109.5 + 10log Pr[kW] - 20log d[km] + 20Log|Wn| (9)

104.8 is the field strength in dB above 1uV/m at 1km from an isotropic antenna radiating 1kW. 109.5=104.77 plus the gain of a vertical short monopole above ground, 4.78dB. 10Log Pr[kW] is the correction for radiated power. 20Log d is the loss due to spreading over the path distance in kilometres. 20Log|Wn| is a negative value and can be obtained only from graphs published in many texts on propagation. The value of the whole equation can similarly be obtained. It is not proposed to further elaborate on equation 9.

NP calculation of sky wave field strength is as follows:

Ezm[dB above 1μV/m]=109.5 + 10log Pr[kW] - 20log(d+ d1) [km] +
20log(cos et) - Lt + 20mlog|Ri|+
20(m-1)Log|Rg|+
Cm + 6 - Lr + 20log(cos er) (10)

109.5 is defined above. 10Log Pr[kW] is also defined above. 20Log(d+d1) [km] is the loss due to spreading over the total path distance in kilometres. The path distance for a sky wave is calculated from the geometry of the configureuration. To save space, no explanation of the method is shown here, but reference 1 gives a good guide. Lt is the cutback factor at the transmitter. 20mlog|Ri| is the ionosphere reflection loss for each of m hops obtained from figure 7 and/or equations 7 & 8. For multi-hop, polarisation conversion at reflection may be appropriate, but is not detailed here. 20(m-1)log(rg) is the ground loss for each of m hops. Ground reflection is included in most texts on propagation, and is also not detailed here. Cm is convergence factor (see figure 10).

20log(cos et) and 20log(cos er) represent the vertically polarised component of the signal at a radiation angle e at both the transmitter and receiver. (In other words, radiation pattern). Normally the radiation angle at the transmitter is the same as the reception angle).

6dB shown here represents the amount the vertically polarised signal strength above a perfect ground is increased at the receiver, because of the adding of the direct ray and the ray reflected from the ground. Lr is the cutback factor, which modifies the signal at the receiver in the same way as at the transmitter. It represents the amount by which the received signal is reduced by ground loss. In Watt, the 6dB gain of the antenna above a ground is included in the cutback factor graphs, but the author believes the method used here is more straightforward.

Using these formulas, graphs for path field strength have been worked out for propagation at 196kHz. On the graphs, the line for a lossless surface wave and a lossless sky wave are shown. The graphs have been worked out for a transmitted power of 100W. In practical situations, the radiated power is a lot less than this, and in a back-yard situation may be less than one per cent. The reader should, therefore, correct the field strength shown according to the actual power. The path signal strengths are shown in figure 11 with a linear distance scale for clarity. All graphs have been worked out for a poor ground with a relative permittivity of 5 and conductivity of .002 Siemen/metre.

Readers might find all this a little hard to follow. The only way to understand it properly is to set a problem and work it through. The author has placed the calculations on computer, but at the moment the procedure is not complete.

A sample calculation sky wave propagation is as follows:

Frequency	196kHz
Earth radius	6370km
Atmosphere factor	1.33
Hops	One
Earth	Poor
Time of day	Night
Radiated power	100W
Assume loss for cos i=0.16 is	12.5
Distance	1000km
Ionosphere height	90km
First factor	109.5
10log Pr[kW]	-10.0
Path distance	(1021)
-20log(d-d1) [km] spreading	-60.1
Elevation angle radiation Et	(8.40)
cos Et (antenna pattern)	(0.99)
20log(cos Et)	-0.1
-Lt cutback	-3.3
Incident angle at ionosphere	(78.10)
Cos i	(0.20)
20mlog(Ri) at i=77.6	-16.0
Cm convergence	2.0
+6	6
-Lr same as Lt	-3.3
20log(cos Er) reception angle (same as for Et)	-0.1

Total signal strength at 2 4 . 4 d B above 1uV/m receiver

Atmospheric Noise

The final factor to be considered is atmospheric noise. No matter how strong a signal is, signal to noise ratio is always the limiting factor. Of course, man-made noise is also important, but it is quite unpredictable. Atmospheric noise at LF is high and increases at a very high rate with decreasing frequency. Noise maps and curves are given in texts on the subject. Several typical noise figureures are given here as a guide to noise level on 196kHz. They are based on noise maps at 10kHz. Doubt is expressed as to whether the figureures can be extrapolated this far, but they may be useful. The figures are based on CW reception with 100Hz bandwidth at 200kHz reception frequency and are relative to 1uV/metre.

Summer day	-15dB
Summer night	-5dB
Winter day	-30dB
Winter night	-18dB

Final Observations

Low-frequency propagation (10 to 200kHz) differs from high-frequency propagation in a number of respects. Surface wave propagation is very strong. There is no skip zone, even though only low-angle sky wave radiation is dominant. This is because of the low height of the reflecting plane, and the long distance travelled by the surface wave. Where the surface wave meets the sky wave, the two merge together, possibly with some cancelling or adding of the two where the strengths are equal. From observation at the receiving site there is no apparent difference between a surface wave and a sky wave. The only actual difference is that the phase velocities are different. More will be said about this in section 4.

From 200kHz down, both surface wave and sky wave improve. The result is that the zone where the surface wave equals the sky wave remains between 500 and 1000km. At 200kHz propagation is poor in the day and reasonable at night. Between 10 and 30kHz, propagation is excellent both day and night. The main limiting factor from an amateur point of view is noise level. The frequencies where propagation is best are those where noise is highest. This is the main reason for very high powers being used for very long distance communications. Another reason for high powers being used is poor antenna efficiency.

On the frequency used by the small group of experimenters here (ref 4) signals transmitted by the author were heard day and night in Adelaide and Hobart, and at night in Brisbane. I don't think the full potential of this has been realised. Experimenters in America with very small power have achieved quite good results.

References

3. Experimental Stations on 196kHz, *Amateur Radio*, July 1984
4. Good explanations of surface wave propagation appear in the RSGB *Amateur Radio Handbook*, and most textbooks on propagation
5. *Radio Engineers Handbook*, Terman, Section 10, Article 5, Reflection of Radio Waves

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Getting Started in Amateur Radio Satellites - Part 7

BILL MAGNUSSON VK3JT, 359 WILLIAMSTOWN RD, YARRAVILLE 3013

LAST MONTH I TOOK YOU through a list of goodies that would set you up with a station for working all the current and near future amateur satellites. Looking back over the series it was a far cry from the very simple gear we used to listen in on the telemetry beacon and digitalker from DOVE in the first article. I hope you've maintained your interest.

The station is now much more complex. Your knowledge of the subject would need to have progressed similarly to enable you to use the station fully and successfully. I hope you took my advice and started to build up your library on amateur radio satellites. I also find it very useful to file and index all messages from the packet BBS regarding the Oscars. This can become an indispensable reference source if kept up to date. Next month I'll be summarising all the currently operational amateur satellites and taking a look into the future. What's planned and when.

This month is devoted to a look at the current birds capable of packet radio operation.

The first operational digital store and retrieve (DSR) satellite was UoSat-2, (Oscar-11). The digital communication experiment it carried was designed to test out the feasibility of such systems in a low-earth orbit. It was a test bed for hardware and software to be used later in Pacsat, Lusat and other such birds.

Packet DSR systems lend themselves very well to operation in orbit. A satellite transponder is useful only to stations mutually inside that satellite's footprint. This can be almost half a world or a couple of thousand of kilometres, depending on the particular bird. With a DSR system, however, you can upload a message in much the same way as to your local packet bullet board system (BBS). It can be retrieved anywhere else in the world, usually in under six hours if the satellite is in a near polar orbit.

The UoSat-2 DSR is not open access in the normal BBS sense. Due to limited memory in the on-board system, it makes use of "gateway" stations around the world. VK5AGR is our local gateway. Graham can forward messages sent to him by packet or other means. The vast bulk of traffic on this device is to and from the other satellite control stations. It was never intended as a general communications gateway, but simply as a test of the hardware and software. You can listen to the UoSat digital communication experiment, or DCE as it's known, and you don't need a packet TNC. Unlike normal packet, it sends frames made up of asynchronous characters. You will, however, need a UoSat demodulator. The DCE comes down as part of the general beacon stream consisting of telemetry, whole orbit data, diary and bulletins. It usually contains a summary of current messages and very often the latest sets of Keplerian elements for the presently active amateur satellites. Software is available from University of Surrey through Amsat-UK for stripping out and formatting the Kep elements from the DCE frames. It's called "DCE capture".

The first open access amateur satellite packet BBS was on JAS-1, launched by JARL on 12 August 1986. It had four uplink channels in the 145MHz band, and one downlink channel in the 435MHz band. It used 1200 baud with AX.25 protocol. Uplink was on FM using AFSK as in terrestrial packet, but downlink used phase shift keying (PSK) modulation and SSB as the mode of transmission.

Many operators world-wide built the G3RUH JAS-1 modem which was needed to go between the radio and TNC in order to cope with the PSK on downlink. It also included an auto-Doppler correction circuit to cope with the tuning problems on the 70cm downlink. Remember, this is not a transponder. It's just like a crossband mailbox in the sky, so there's no cancellation of Doppler by an inverted output. The rate of change of Doppler shift on 70cm is rather savage on an overhead pass, and without auto-tuning it would be difficult to make and maintain contact.

JAS-1 suffered from the start with power budget problems. Despite the somewhat erratic scheduling of modes with much unannounced switching between the analogue (mode JA) and digital (mode JD), many stations used the DSR feature of JAS-1 mode JD (digital). The BBS worked successfully using the callsign 8J1JAS. Its mailbox relayed messages to and from operators in many countries. It was officially switched off late in 1989 due to the impending launch of its successor JAS-1b on 7 February 1990. JAS-1b uses the callsign 8J1JBS.

Incidentally, like JAS-1, JAS-1b also carries mode JA. Analogue mode JA is a linear inverting transponder. It can be used for normal SSB voice or CW communications.

To work the BBS on JAS-1b you will need a PSK demodulator for downlink, and an SSB receiver. Circuit boards and kits and completed PSK demodulators are available from a number of sources in Australia. Its uplink is just like connecting to a normal terrestrial BBS. Except, of course, you need to point your antenna up in the air! It uses 1200 baud FSK on FM. The uplink channels are 145.850, 145.870, 145.890 and 145.910MHz. Listen first to see if you can hear any local stations, and choose an appropriate uplink channel. The downlink is on 435.910MHz. It is 1200 baud PSK (SSB) using AX.25 protocol. You will need a G3RUH or TAPR or PacComm PSK modem. You may have one of the new all-singing, all-dancing multi-mode modems, in which case it will probably have PSK on board. The beacon is on the downlink channel. Listen for it before trying to connect to the BBS. It is in a power-saving mode which transmits only short bursts until someone attempts a connect. It then springs into life. A connect is made in the usual way by typing C<space>8J1JBS<Enter>. If you're successful, you'll be greeted with the usual ***CONNECTED to 8J1JBS' line, and a prompt line showing commands as in terrestrial PBBS operation.

Including JAS-1b, there are four currently operating packet capable amateur radio satellites. The others are UoSat-D (Oscar-14), Pacsat (Oscar-16) and Lusat (Oscar-19). JAS-1b has the designation Oscar-20, being the 20th Oscar to achieve orbit and operational status.

To work all of them, your station would need to be equipped with the following:

2m and 70cm FM and SSB

2m and 70cm tracking antennas (auto-tracking essential)

A good computer (preferably IBM or clone)

Normal packet capability, including 9600 baud

PSK modem with auto-tune

G3RUH UoSat demodulator

An operator with lots of skill and pa-

(Continued Page 19)

Technicalities

COMPILED AND CONDUCTED BY ROGER HARRISON, VK2ZTB

THIS COLUMN IS DEDICATED to disseminating practical, do-it-yourself hints, tips and techniques for the amateur interested in experimenting, tinkering and homebrewing—the "Saturday arvo solderer rules, OK!"

The one thing that stymies so many newcomers when it comes to experimenting with RF circuits is *construction practices*. A recent two-part article in the February and March 1991 issues of the RSGB's *RadCom*, by Ian White G3SEK, on "How to Lay Out RF Circuits" provides good, practical advice for experimenters.

As Ian points out, "If a circuit is well designed on paper, it only has the *potential* for working well. How it works *in practice* depends on the layout. Poor layout can ruin the performance of even a well-designed circuit.

"Most layout problems with RF circuits can be traced to unwanted coupling or feedback of signals from one part of the circuit to another. Strong positive feedback can cause oscillation, and negative feedback may cause mysterious lack of gain. At lower levels of unwanted feedback, the equipment may work after a fashion, but behaves in a skittish and unreliable way."

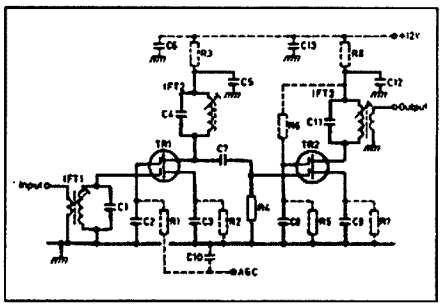

Figure 1. A two-stage IF amplifier used in the example of RF layout illustrated in Figure 2. The dashed portions of the circuit delineate the strictly DC sections and components. (Courtesy RadCom).

Ian goes on to explain the techniques or 'rules' of good RF layout, pointing out that it is easier to implement with 'ugly' construction in which no attempt is made to make the layout look 'pretty', rather, the major concern is making it work.

The first rule is: DO NOT WIRE RF CIRCUITS AS THEY ARE DRAWN.

To illustrate, Ian White uses a two-stage IF amplifier circuit using dual-gate FETs, as in Figure 1, giving a preliminary line-up, Figure 2a, and then final RF layout, Figure 2b. The principles employed are straightforward:

1. Lay out the signal path in a straight line (from input to output).

2. By juggling with the orientation of the components in the RF signal path, group the RF ground connections for each stage close together, without mixing-up the input and output grounds.

3. Place the non-RF (i.e DC section) components well clear of the signal path, throwing in some extra decoupling components.

The "extra decoupling components" refers to capacitors C6 and C13. While they are seemingly in parallel, and circuit-wise, one is sufficient for bypassing of the positive supply rail, each stage is best bypassed as close as possible to the positive dc supply "entry" point.

Thus, when laying out an RF circuit, you need to first identify three things:

(i) which are the RF components, as distinct from those which deal with DC or low frequencies?

(ii) which components are in the main RF signal path?

(iii) which components are in the ground return paths.

The copper on a single sided sheet of pc

(Continued on Page 20)

Getting Started in Amateur Radio Satellites

(Continued From Page 18)

tience ... and, finally

A library of up-to-the-minute information on just about everything to do with satellites and packet.

Combined with all the other goodies already mentioned to set up a satellite operation, this may seem like a tall order, and it is. It may be some consolation to know that there are probably no more than a dozen or so stations in VK that can comfortably cope with ALL the modes on ALL the Oscars. Most operators specialise.

Many only work the high flying birds like Oscars-10 and 13. Some find more challenge in working the low-earth transponders like RS-10/11. Still others (perhaps with a mathematical bent) find fascination in translating telemetry information.

If, however, you develop an interest in the orbiting digital bulletin boards (the packet birds) you will need to put in a lot of work on your station to get it all together. Any compromise will be reflected in your results. You would need to have a complete station, a broad operating experience base both in satellites and packet, and be willing to spend a lot of time combining the two into a smooth operation. It would also help to have six arms!

The situation at the time of writing is that the new micro-sat BBSs will require specially written software for your computer. The problem is that most terrestrial BBSs and other packet applications at present run at 1200 baud. There are moves to increase this, and some systems are running at 2400 baud already. Time, of course, is of the essence. As more users wish to avail themselves of the ability to transfer files and large documents, 1200-baud systems have trouble with throughput. Terrestrial systems with lots of users find it hard to cope, and the inevitable way out is a general move to higher baud rates.

As if that's not enough, a satellite BBS has another problem. That is the limited time that a low-orbit bird is in your sky. Typically, only 10 to 12 minutes or so in the case of a fairly high pass. You may be able to extend that out to 15 or 16 minutes with a high gain antenna and accurate auto-track system. If the downlink is running at 1200 baud it can quite easily tie up the system for the whole of the pass if someone is uploading or downloading files. Tests on UoSat-3 (Oscar 14) have shown that a system running at 9600 baud can handle file and document transfer very well. Receiver bandwidth will need to be addressed as the system develops. Software protocols are being specified presently, and no doubt the software developers will soon be well under way.

It's hoped that the software will be available by the time the new microsat BBSs are fully commissioned.

Our station may well be required to have the ability to switch baud rates during a connect to cope with different downlink applications.

Next month's article will give a summary of all the current amateur satellites, and try a bit of crystal-ball gazing. There are lots of exciting plans in the wind.

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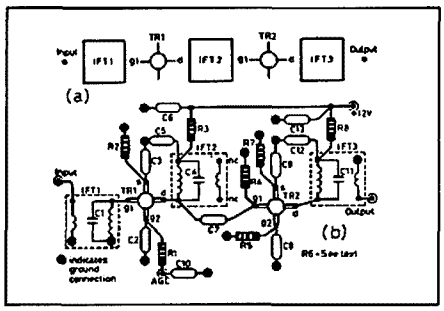

Figure 2. Layout sketches of the Figure 1 IF amp; (a) preliminary line-up and (b) the final RF layout. (Courtesy RadCom).

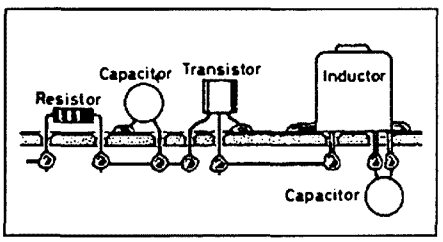

Figure 3. Wired-track RF construction, using a single-sided board, copper side uppermost. (Courtesy RadCom).

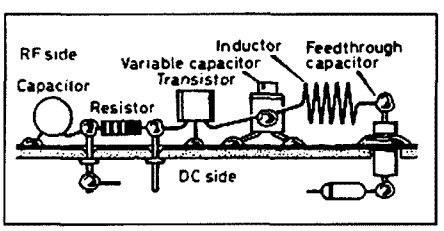

Figure 4. Pin-and-wire RF construction, again using single-sided board, copper side uppermost. (Courtesy RadCom).

board makes an ideal RF ground, generally termed a "groundplane". As Ian White explains, "Almost every RF circuit has an input, an output and a common ground connection. Many circuits also have additional ground connections, both at the input side and at the output side. It is vital to keep input and output ground connections distinct, and to place a low-impedance common ground between them."

You can identify components in ground return paths because they provide a path for RF and a point where dc or LF enters the RF circuitry. Hence, bypass capacitors in the drain and source circuits of Figure 1, for example, provide ground returns. Hence C3 and C5 in Figure 2b are soldered to the same point on the copper groundplane, as are C9 and C12.

He goes on to explain quite a few more techniques, such as dividing a project into modules which can be separately boxed and screened, using screened inductors or toroids in preference to open coils (at frequencies where its practicable), placing RF and DC circuit sections on opposite sides of the board to avoid coupling RF into supply circuitry, and more.

You don't need to lay out and make a 'proper' printed circuit board, either. Ugly construction will get you a working circuit with just as much satisfaction and less frustration. A piece of single-sided pc board with 'wired tracks' works fine, supporting components on pc pins, gluing ICs in place with their legs in the air, and using direct wiring between circuit points. The 'pin-and-wire' technique is similar. Figures 3 and 4 show how it's done.

You simply mark out component and pin positions and drill the necessary holes (typically, 1.0 mm) in a piece of single-sided board, remove the copper groundplane from the immediate vicinity of the holes using the point of a 3-4 mm drill held in the fingers, and then wire up the back (i.e. non-copper) side of the board using bits of hookup wire or tinned copper wire. Such construction is quite robust; big components can be held in place on the board with cyanoacrylate ('Super') glue. Figure 5 shows how such boards may be mounted in a screening box.

Where connection points may be required on the copper side of an ugly construction board, you can cut out an 'island' of copper, or glue a small patch of single-sided blank pc board where its needed, as illustrated in Figure 6.

When mounting ICs to such a board, you can tip them on their back (so-called 'dead-bug' construction) and glue them in place on the copper side of the board, bending grounded pins down and soldering them directly in place. (If you don't want to glue them down, just let the ground pins hold them). Alternatively, you can place them right side up ('live bug' construction). Both techniques are illustrated in Figure 7.

For those who are newcomers to RF construction and experimentation, Ian White recommends the ARRL's *Solid State Design for the Radio Amateur* by

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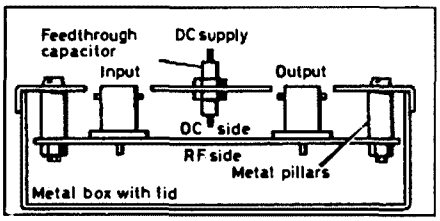


Figure 5. Mounting such boards in a metal shielding box. (Courtesy RadCom).

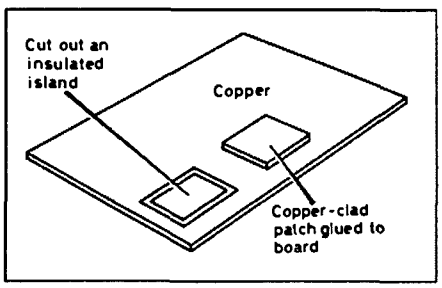


Figure 6. Connection point on the copper side can be arranged by cutting away the copper to form an insulated island (use a sharp hobby knife for this), or by gluing a small patch of copper-clad board on the copper side. (Courtesy RadCom).

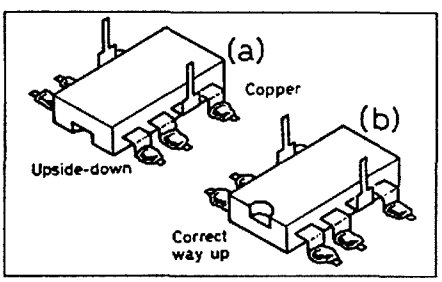


Figure 7. Showing 'dead bug' and 'live bug' mounting of ICs. (Courtesy RadCom).

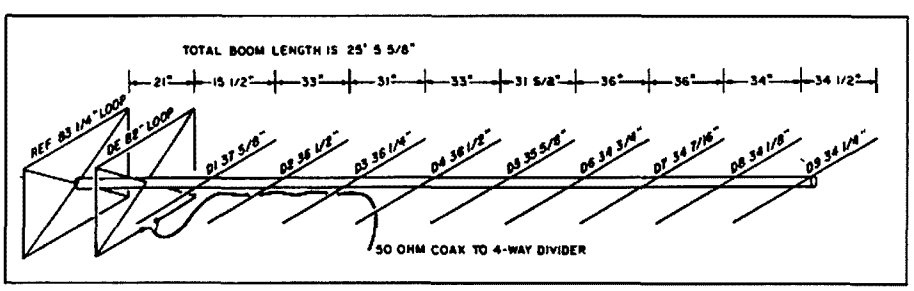


Figure 8. W5UN's long boom Yagi optimised for 144.050 MHz, giving a gain of 13.25 dBd. The directors are all made of one-eighth inch solid aluminium rod cut to length with a tolerance of plus/minus one-sixteenth inch. The reflector and driven elements are shaped into square loops using No.12 solid insulated copper wire ('TW type' insulation, which means nothing to me); insulation left in place. The boom is either non-conductive sealed wood (e.g. soak it in Linseed oil) or fibreglass. (Courtesy 73 Amateur Radio Today).

Mini Equipment Reviews

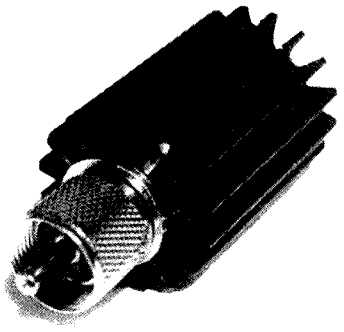
RON FISHER VK3OM
24 SUGARLOAF RD BEACONSFIELD UPPER 3808

OVER THE NEXT FEW MONTHS, we are going to present a series of reviews on small ancillary pieces of equipment that you will find useful around the shack to increase the versatility of your gear. We will look at such items as microphones, speakers, SWR power meters, antenna switches and the like. Let's hope that you find it of interest, and if there is anything you would like to see written up, drop a line and let us know. To kick off, here are three useful antenna items from the Dick Smith catalogue.

The Dick Smith 15-Watt Dummy Load. Cat D-7025

As everyone knows, a good dummy load is an essential item of test equipment in the shack. The Dick Smith unit is made in Japan by the Revex Co, with a finish and construction that are first class. As the photo shows, it is very compact. Rated at 15 watts continuous dissipation, it will actually take up to 100 watts for short periods. A rating graph is supplied which enables you to work out how much power you can apply. Of course, the ratings apply to steady power as produced by an FM transceiver, or by your HF transceiver when operated in the CW mode. When in the SSB mode your average output is probably about only 50 per cent of the PEP output, so you can use the dummy load for a longer period of time. The load was tested under a variety of conditions. With 100 watts applied for the maximum 30 seconds, the load became very hot (on a cool day), so it's important to make sure that there is plenty of space around it to allow enough air circulation. It also needs enough time to cool down before being used again.

According to the instruction sheet, a version with an "N" type connector is



15 watt dummy load

produced, but I am unsure if Dick Smith stocks this. If they do, this would be recommended for use on 430MHz and above. The PL-259 version is rated for use to 500MHz, but with a 1.15 VSWR at the highest frequency.

The instruction sheet supplied, actually part of the packaging, is adequate, but some translation into English is needed. For instance, "As this device absorbs a high frequency current completely, it can supply actual current to high frequency equipment with emitting a spurious current." Perhaps they are right, but I am really not sure.

The Dick Smith S-20 Quality Two-Way Coax Switch. Cat D-5208

Again, this is produced by Revex in Japan for Dick Smith. Described in their catalogue as a "quality" switch, it certainly lives up to the title. Although rated for use up to 1000MHz, the use of standard PL-259 connectors fitted to your coax cable would, to my mind, limit its normal use to the 2m band, with possible occasional use on 70cm. Again, a version of the switch is produced with "N" type connectors and is stocked by Dick Smith (Cat. D5202).

The internal construction allows a constant 50-ohm impedance to be maintained. The front switch actually moves an internal metal leaf from one output connector to the other. Rated to carry up to 1000 watts PEP, it would be more than adequate for Australian conditions. The switch is built into a heavy diecast housing and fitted with three mounting lugs which enable it to be screwed to a wall or to the operating table.

Again the instruction is part of the packaging and takes a bit of translating. However, the specification is straightforward enough, and I guess that's about all you really need.

Power/SWR Meter with PEP Reading. Cat D-1360

This is a very elegant meter which will provide you with a lot of information. It is rated to operate over a frequency range of

(Continued Overleaf)

Technicalities

(Continued From Page 20)

Doug DeMaw W1FB and Wes Haywood W7ZOI. I heartily agree with his recommendation. It's available through Divisional bookshops and worth every cent of its $21.60 price. Fortunately, much of the RF componentry used in the projects described is available in Australia through firms which advertise in *AR*.

Long Boom Yagi for 2m

Few 2m band enthusiasts would not be aware of Dave Blaschke W5UN. He has the singular honour of having worked 100 countries (gaining DXCC) on 2m - via Moonbounce! Secondarily, he's famous for his Might Big Array (MBA) 2m moonbounce antenna system which uses 48 stacked long boom Yagis, boasting a gain of just over 30 dB.

In an article titled "Two Metre EME Primer" in the March 1991 issue of *73 Amateur Radio Today*, Dave says that it's quite possible for 2m stations of quite modest capability can work moonbounce — 100 watts of RF to a long boom Yagi having at least 13 dB 'true' gain over a dipole can work his station. Certainly, there are plenty of VK 2m operators who can attest to being able to hear W5UN via moonbounce. In his article, Dave describes a long boom Yagi optimised for 144.050, having a gain of 13.25 dBd, built on a boom about 25.5 feet long. Dimensions are given in Figure 8. The driven element and reflector are both quad loops, making this antenna a 'quasi-quagi' (a quagi is a Yagi array of quad loops).

Such a Yagi is also ideal for serious long distance terrestrial working on 2m and could be recommended for those who'd like to try their hand at aircraft-enhanced long distance contacts, where a lot of work has been done on the Sydney/Canberra-Melbourne path and the Sydney-Brisbane path. ar

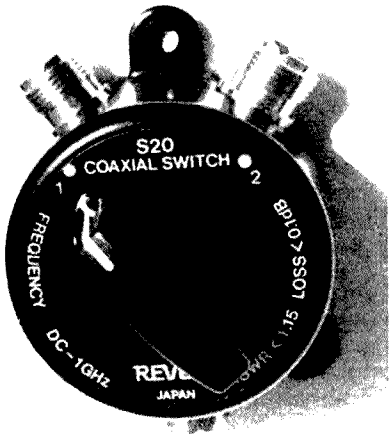


Figure 2

Mini Equipment Reviews

(Continued From Page 21)

1.8 to 60MHz, with a power rating of up to 2000 watts.

One of the great features of this meter is its ability to show actual PEP output. An internal circuit board with four transistors and two 741 ICs operate this circuit. This and the 2m illumination lamps require 13.8 volts at 200mA from an external source.

Three power ranges are provided, 0/20, 0/200 and 0/2000 watts full scale, and for the QRP operator, accurate reading as low as one watt can be taken. The external DC supply is required for the power meter to operate, but SWR measurements do not require it.

Pulling out the "calibrate" knob enables the PEP facility, and I found that it is best to leave it in this position at all times, as the average reading remains the same either way.

I found that I would have preferred the PEP measurements to have a slightly longer decay time.

I think some type of "peak hold" circuit could be useful. The accuracy was checked on steady carrier of various power levels against my standard RF watt meter and found to be within five per cent.

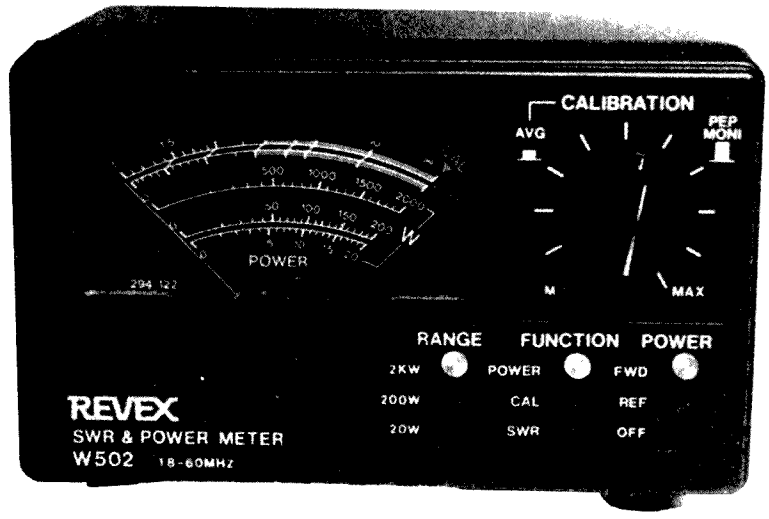


Figure 3

It was noted that the specification states that the reading will be five per cent high on 160 and 80 metres, and this was found to be correct. With 13.8 volts connected, the meter presents a most attractive appearance. The instruction sheet supplied was obviously written in Australia by the Dick Smith staff. There is no Japanese English. A full circuit diagram is included.

All three of these items are recommended.

Prices are as follows: the 15-watt dummy load, Cat D-7025, $39.95. The Quality two-way coax switch, Cat D-5208, $69.95, and the Power/SWR meter, Cat D-1360 is $199. They are available at most Dick Smith outlets.

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Microwaves ... The New Frontier

LES JENKINS VK3ZBJ
190 HASTINGS RD
FRANKSTON 3199

BORED WITH REPEATERS? Tired of the bedlam of HF DX? Put off by packet? Soured with satellites? Then perhaps there is another aspect of amateur radio that has escaped your attention.

Amateurs have always been somewhere about when the major breakthroughs in radio communications occurred. It may well have been before your day ... even before you were born. Nonetheless, there are still frontiers of technology to be exploited and there is no good reason not to be involved.

There is a strong suspicion that old Mr Hertz produced his first "clicks and clunks" on microwave frequencies. If this be the case, we have certainly taken our time to catch up with the old codger! Nevertheless, the latter part of the 20th century heralded the move to more and more use of microwaves, as satellites cluttered our skies and true global communications emerged.

From an amateur's point of view, this is a good thing. The more international communications move to satellites, the less pressure there is on our hallowed HF spectrum. For those dedicated to overseas contacts, the future looks fine.

Meantime, back at the microwave scene, great inroads are taking place in our amateur allocations. Why?? Simply, we don't seem to regard them as highly as we do our lower frequency bands, so who cares! We've got plenty of space to pursue our interests on those bands the rest have lost interest in.

New Horizons

AOCP candidates undertake a study course in their basic radio theory and regulations, with the Morse Code being an additional qualification. In most cases they will receive very little instruction in the specifics of applications of the higher frequency amateur bands. It is even probable that they will graduate and participate in the general activity without ever becoming aware of the existence of the many allocations available above, perhaps, the 23cm band.

Consider the HF dedicant who constantly strives to find some accommodation in the crowded bands available to him. To find a spare few kiloHertz is somewhat akin to finding gold in the back yard! Imagine his reaction to finding 150 MegaHertz of totally unused spectrum lurking in the 13cm band! To be advised that another 150MHz is also lurking between 3300 to 3400MHz would only rub salt into the wound.

Some History

Most HF operators have been schooled to believe that VHF is limited to short "line-of-sight" paths. In spite of this indoctrination, many amateurs throughout the world have blissfully ignored these precepts and made contacts over many thousands of kilometres on VHF, UHF and microwave frequencies. Having done so, they join the very elite band of operators in the Hall of Fame.

These super contacts are not confined to overseas countries, with Australian amateurs being well in the forefront of this activity. Transcontinental contacts on bands up to 3300MHz have been achieved in recent times, and these record contacts are constantly under attack by other dedicated stations desirous of becoming world or national record holders.

Current standings in this field are published in most of the amateur journals or call books. They make very interesting reading and serve as a guide to the goals which might be set by operators interested in making a serious onslaught on some of the records.

What's Happening?

To the majority of operators, this will seem too ho-hum to be bothered with. For a start, the necessary equipment is not listed in the inventories of major suppliers, so is inaccessible to the rank and file of operators. Many will lack the technical skills necessary to attempt construction and will be hard-pressed to find any help from local amateur publications.

There is, however, an alternative path which can be taken. This is simply to search out those operators in your area who are active on these bands. To assist in this, I have included some names and callsigns of active operators in the major capital city areas. These "hams" are always on the look-out for new blood to help populate the bands and provide more contacts in their area.

Whilst there is not a lot of general activity on the bands, it must be borne in mind that, unlike the lower frequencies, the coverage of many microwave stations is limited by the very narrow beamwidth of antennas. Nevertheless, the type of transmission possible on these bands makes them attractive for point-to-point links between stations which are interested in high quality television or high-speed data exchanges.

Wide-band modes are not the only ones supported by present activity. SSB may be heard on 1296 and 2300MHz. Narrow band FM (+/- 3kHz deviation) is commonly used on bands up to 10,3000MHz. Some SSB is contemplated on 3300MHz, and some overseas operators use SSB on 3cm.

In most cases the power available is quite low. One hundred watts on 1296 is rare, but, add to this some 25dB of antenna gain from a 2m dish (316 times) and the effective power becomes 31.6kW ERP! Even on 3cm (10,000MHz), 100mW times 33dB antenna gain becomes 200 watts ERP. Add to this the same antenna gain at the receiver, and the equivalent power between dipoles becomes quite alarming! (Try 400kW ERP!!!)

Bear in mind these 33dB gain antennas are the size of a dustbin lid (about 57cm or 2ft in diameter) and the message is loud and clear.

What's Available?

In short not very much!

There are quite a few commercial rigs available for 23cm at this time. They range from basic one-watt FM units to 10-watt multi-mode devices. Sadly, not many of these rigs appear to be attached to respectable antenna systems, most operators being satisfied with the inadequate vertical devices offered by the agents. Common practice dictates horizontal antennas of respectable gain as the preferred option.

There are a few kits available for 23cm and 13cm, most capable of SSB operation when driven from a 2m rig. None of these offers much power and they are, at best, a starting-off device. Notwithstanding, they are providing some quite exciting results for those who have taken the plunge, particularly when supported by some of the more robust stations.

Three centimetres is a favourite band

(Continued Overleaf)

Amateur Television - Whither Hence?

BY JOHN INGHAM VK5KG
37 SECOND AVE, SEFTON PARK 5083

ATV IS AT THE CROSSROADS; 576MHz rescinded; ATV repeaters closed down to make way for broadcast TV transmitters; WARC-92 looming with the threat of loss of much of 420-450MHz. Where is ATV heading?

First, allow me to establish my credentials as an "ATV seer"! While many may know of my activities as the WIA Federal Videotape Co-ordinator, my interest in amateur television started some 30 years ago in the early '60s, long before non-broadcast video recorders were developed.

But it wasn't until the early '70s, when I was living in Edmonton, Canada that I struck up a friendship with a fellow ATVer whose QTH happened to be at the bottom of a very deep river valley. Try as we might we could never exchange pictures between our QTHs. One day, the idea occurred to us to build a small ATV repeater and site it on the rim of the valley. As I thought long and hard about it, I realised that the advent of the repeater would have a far greater impact on ATV operation than it has on phone operation.

If you have never attempted point-to-point ATV transmission, it would probably never have occurred to you just how difficult it is. Because of the very wide bandwidths involved, and the very high frequencies to which ATV is confined (with the attendant high path losses), it is necessary to use very high gain (and very directional) antennas for both transmission and reception.

Under these conditions, unless both antennas are already aligned, it is unrealistic to expect many replies from an ATV "CQ" call. It occurred to me that an ATV repeater situated high above "ground clutter" had the potential to revolutionise ATV operation; at last ATVers would know where to point both Tx and Rx beams *prior* to calling CQ!

We never got around to building that first ATV repeater, but I published my ideas in a Canadian amateur radio newsletter before returning to Australia late in 1973. I found the Adelaide ATV scene much as I had left it, but with a handful of diehards struggling to punch their signals through the suburban tree-lines. After I had become established at my new QTH I interested the local ATV group in an experiment to prove the merits of an ATV repeater. Using a 576MHz transmitter built by Maitland Lane

(Continued Overleaf)

Microwaves . . . The New Frontier

(Continued From Page 23)

for contemplation. The ready availability of basic Gunn oscillator assemblies makes it an attractive proposition, but most enthusiasts seem to fall apart when antennas and receiver "back-ends" require to be made! There is an alternative which makes use of speed radar detectors (now illegal in some states) which make excellent receivers with little modification.

Crystal locked gear for 10,368MHz is achieved by the use of step recovery diodes (snap-off diodes) driven from a few watts at 1296MHz. This technique can yield up to 200mW in a simple waveguide multiplier. Receivers can be produced in much the same way, using cheaper, low power SRDs and simple mixers. Alternatively, Gunn oscillator receivers, followed by a simple tunable IF receiver with AFC, give good results.

Who's Out There?

Unfortunately, not too many! Still, there are several stations in the capital cities which are active.

In Melbourne VK3s ZBJ, YTV, BBU, ZJC, KAJ are well equipped for bands up to 25GHz. Numerous modes are available, including FM television on 2431MHz from 3ZBJ and 3YTV.

Sydney has Bill VK2ZAC, with several others in the wings. Lyall VK2ALU is actively investigating 3cm propagation from the Wollongong area, as well. *(The original text also mentioned Dick VK2BDN, who became a Silent Key recently.* Ed). The ACT is represented by Eddie VK1VP, who is active on at least 1296MHz. (I well remember our first contact, Eddie, over the expanse of Lake Burley Griffin).

Further north, Steve VK4ZSH carries the banner, and would be pleased to hear from enthusiasts.

Over in the west we have Trevor VK5NC (Nasty Cough), who is "go" on 23cm and 13cm, with Chris VK5MC who has EME capability on 1296 and 2300MHz. Adelaide is host to Des VK5ZO and his partner VK5NT, along with Reg VK5QR, who is one of our most prominent achievers. His "partner in crime" is Wally Green VK6WG at Albany, who is a vigorous extender of records!

There will, of course, be others of whom I am not aware. They will excuse me for this, as our journals don't make much of their activities, so information comes only from personal contacts or "word of mouth". If you feel that your efforts or presence have been neglected, drop me a line, as we would be pleased to discover other stations which share our interests.

In Conclusion

As amateurs, we share a rare privilege in having available so many bands on which to experiment. The use of these bands reflects our interest and, hence, the continued availability of those privileges. If we choose to regard the "too-hard" bands as being of little interest, we leave a poor legacy to those who will succeed us.

Modern technology has several prongs. Digital concepts yield marvellous "gadgetry" which tends to obscure the radio-based technology on which it relies. The real progress in pure radio technology lies in the exploitation of those bands which are the basis of the modern communications explosion. As time progresses, more and more international networks will abandon HF for the more reliable microwave linked satellite facilities.

Amateur have been associated with satellite communications since the early days of its inception. Australian amateurs contributed to this when they built and launched OSCAR-5 in the late 1960s. Subsequent satellites have continued to be launched and will remain a major activity activity into the future.

It is certain that amateurs will follow the trends of commercial methods, and future satellites will provide access on much higher frequencies will form a sound basis for future access to these systems.

It may be of interest to note that, over the John Moyle field day weekend, VK3YTV portable at Mt Buninyong (near Ballarat) exchanged good television pictures with VK3ZBJ at Frankston. The frequency used was 2431.75MHz, and the mode FM. The distance is 121km. We were also pleased to have a visit from Steve VK4SZH during these activities.

So, the horizons are there; all we have to do is conquer them. ar

VK5AO, plus my own receiver and antennas, we duly assembled an ATV repeater on a high spot overlooking Adelaide. The rest is history.

While VK5RTV was not the first licensed ATV repeater in the world (we were beaten by a group in Washington DC) it was the first to be actually licensed in Australia. Since then, wherever an ATV repeater with output in the 576MHz band has been licensed, interest in ATV has soared.

Part of the success story of ATV in Australia can be attributed to the fact that the modern domestic TV set can tune to 576MHz (ch 35) without modification. Indeed, many present-day operators owe their start in our hobby by their chance stumbling across an ATV repeater output while "fiddling" with their TV set. And the ready availability of domestic TV cameras and recorders has also encouraged many more.

So, that brings us up to date. But, what of the future? Is there really nothing but doom and gloom for the ATV operator? Although at the turn of the century there probably will be far fewer ATVers able to transmit as we do today, perhaps all is not lost!

In the year 2000 the television telephone will be well established in many homes and businesses. The technology already exists. In September 1989 I saw a working demonstration in Melbourne of a digital television telephone whose use is intended for Telecom's new Integrated Services Digital Network (ISDN) and which has a bandwidth not much more than a single telephone conversation today.

True, its electronics took up the best part of a whole rack. But the promise is that, by 1994, development of dedicated large-scale integrated circuits will enable its size to be condensed into that of a shoe box, and sell for about the same price as a cellular mobile telephone currently.

A large base of domestic equipment suitable for use on ATV has been the catalyst for many operators in the past, and future ATV developments depend on narrower bandwidths. But, could a digital television telephone be put to use for ATV purposes?

In the rest of this article I will call on my experience in the field of digital compressed television for video-conferencing to explain something of the techniques digital television telephones use to compress a live wideband video signal so that it can be connected to Telecom's ISDN. Such compression is equivalent to squeezing some 900 telephone conversations down in bandwidth to that normally occupied by one or two!

This description is of a notional system; the exact details are being kept under wraps until the digital telephone is officially released.

Firstly, it must be understood that I am talking about **live colour TV** here, not slow-scan or monochrome television. However, certain compromises in picture quality have been made in line with the anticipation that the picture when displayed will be usually quite small, and gross movements of the subject are not expected.

As an initial step, a major reduction in the required bandwidth is made by halving the spatial and temporal resolution, ie by transmitting:

half the number of scanning lines
half the detail in each line
half the number of pictures/second

which leads to an eight times reduction in bandwidth (down to the equivalent of 125 phone conversations).

Corrections at the receiving end are, of course, applied to compensate. These double the number of scanning lines and pictures/second back to the original numbers, but the small size of the receiving screen reduces the need for as much detail.

The transmitting end contains a frame store which compares each new frame coming from the camera with the previous one; only those parts of the picture which contain actual changes are then transmitted. This again reduces the bandwidth by reducing the amount of information which needs transmission.

So as to analyse the screen for movement, the picture is subdivided into some 256 little squares, each being about 16 pixels by 16 lines. If any movement is detected in any square, the whole square is transmitted; conversely, if no movement is detected, then the frame store within the receiver simply repeats indefinitely the information contained within the square.

The information about each pixel is described in terms of the *difference* between its new value and its previous value. This information is encoded in a digital form in such a manner that the most statistically likely changes are transmitted using the shortest digital "words". This further reduces the bandwidth requirements.

If gross picture changes are detected at the transmitter, the system momentarily drops to a lower resolution mode. For instance, if you move out of camera shot and someone else takes your place, the effect is of a "rough sketch" transmitted forthwith with the details filled in almost immediately.

In case of interruption of the signal, the image on the receiver "freezes" until the signal is restored. At the start of transmission (and when recovering from transmission path errors which may scramble the picture) a fresh picture is established by slow-scan which takes several seconds. This uses special information which is continuously being sent as a background task for just such a purpose.

One of the features of the system as described is that it is one-way, ie it does not require a continuous "hand-shaking" between transmitter and receiver (in the manner of packet radio). Therefore, the information can be broadcast (to more than one receiver) or recorded for future playback. And digital sound is incorporated in the signal as well.

So how might the compressed television signal be transmitted? In its native form as a digital signal it would lend itself well (with suitable processing) for transmission and reception over long paths on amateur radio. However, in that form, its bandwidth would still be several hundred kilohertz , and careful filtering techniques would be required to avoid interference with other users.

Alternatively, the digital signal could be converted back to an analogue forms by means of a Digital-to-Analogue Converter (DAC).

In this form, with a bandwidth of no more than 10kHz or so, it might be frequency modulated and even transmitted on 144MHz. Imagine, live colour ATV on two metres!

So, there you have it! As we come to the end of the 20th century, maybe live amateur TV still has a future! But it will be very different from that which might be expected by an examination of a typical ATV station of today. ar

Don't buy stolen equipment - check the serial number against the WIA stolen equipment register first

Fox-Hunting Skills Put to the Test

IVAN HUSER VK5QV
7 BOND ST, MOUNT GAMBIER, 5290

IN THE EARLY HOURS OF THE morning on Australia Day (26 Jan), a single-engine seven-seater Piper Saratoga aircraft with three persons aboard was cleared for take-off from the Mount Gambier airport by Civil Aviation's Flight Service Centre in Adelaide. The aircraft was heading for Warrnambool in Victoria. When the pilot failed to make radio contact after take-off, police in Mount Gambier were alerted and emergency contingency actions put in place.

The aircraft's emergency beacon, monitored by satellite, gave the position of the crash as some distance east of the airport. This was later found to be not the case.

Hampered by the blackness of the night, a search of the area by police, State Emergency Service, country and metropolitan fire service personnel proved fruitless.

At around 0245 local time, the police phoned Steve VK5NSE and Wayne VK5ZX. After quickly explaining the situation, a request was made for radio amateurs with direction-finding skills and equipment to join the search for the missing aircraft.

There was some doubt as to the authenticity of the phone call at first, since the last digits of the police phone number, 1020, were given over the phone by the police as "ten twenty". An unfortunate abbreviation. Was it a hoax? A return phone call confirmed that it was in fact a real emergency and that assistance was urgently required.

One of the search vehicles. Photo Border Watch *newspaper.*

Like most of us at that time in the morning, the rudely awakened pair was not at its best, but soon responded to the urgency of the situation.

The immediate questions requiring immediate answers at that early hour were:

"How does one DF an emergency beacon?"

"Who has the best fox-hunting expertise in town?"

"Who would have suitable gear that works?"

"How does one awaken somebody in the middle of the night to ask if he would like to go on a fox hunt, anyway?"

"Crikey - why us?"

Phone calls to Greg VK5ZGY and David VK5FF produced a brace of hand-held scanners capable of receiving the signal from the beacon, a pair of attenuators and Yagis, plus the expertise.

With the beams hurriedly modified for the lower frequency of the beacon, Steve and David set off in one vehicle, and Greg and Wayne in another.

Although the telltale smell of AVGAS was in the air, it was too strong to get a fix on the aircraft, and it was the direction-finding skills of Steve and David that finally led the rescue team to the wreckage. The official time for the discovery of the wreckage was 0450. Congratulations to all concerned.

Sadly, the pilot and his two passengers perished when the aircraft apparently clipped the top of pine trees just north of the airport and dived into the ground only a few hundred metres from the end of the runway. No official cause for the crash has yet been given.

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The wreckage 300-400m from the end of the runway. Photo Border Watch

How to Occupy the XYL So You Can Enjoy Urunga

MARILYN WILLIAMS XYL VK2BUI
LOT 5 MASTONS RD
KARANGI 2450

THE URUNGA RADIO Convention has come a long way since 1948. Back then, a few "hams" took their XYLs and harmonics to the coastal town for a relaxing long weekend. Only 25 kilometres south of Coffs Harbour, Urunga is at the mouth of the Kalang and Bellinger Rivers, an ideal fishing spot. Well, fishing and drinking are oft a pigeon pair, and while the lads "caught" dinner, the rest of the family could swim safely in the lagoon or catch some waves at Hungry Head.

These days, having just celebrated its 43rd year, the Urunga Radio Convention offers so much more. It kicks off on Easter Saturday morning with a street parade and market. The Senior Citizens' Hall houses an array of "beautiful junk" for your perusal between fox hunts. There is an assortment of irresistible raffles, and both technical and non-technical quizzes to keep the ladies thinking, too. The snack bar is open all weekend, supplying free tea and coffee and very reasonably priced steak, sausage sandwiches, and topped off with apple pie and ice-cream.

However, somewhere in between all this, the hidden transmitter hunts and trying to outfox the fox, the YXL and harmonics get restless.

The Bellinger Valley is embraced by magnificent mountains, unrivalled scenery, crystal clear waters, majestic rainforests and waterfalls. It forms part of a stunning array of coastal beaches, wetlands and river estuaries.

In less than half an hour the XYL can be wearing the harmonics out on a walk through the rainforest at Dorrigo National Park, which was placed on the World Heritage List in 1986. A new walkway and viewing platform allow visitors to stroll through the rainforest canopy. After that, they'll be glad to re-energise at the Carriageway cafe in Bellingen on the way back. They'll follow obediently as she peruses the Bellinger River Gallery, upstairs. On the way out, even the kids will find something of interest in the Hammond and Wheatley Emporium.

Of course, Urunga is still one of the best fishing and swimming spots around. Amateurs haven't tormented the yabbies in years, so they should be abundant. There's an opportunity to be educated at the large yellow concrete beehive known as the Urunga Honey Place. Or, you can relax at dusk with a Belgian beer in the Dutch Coffee House at nearby Fernmount. If wine is your favourite tipple, then the winery at neighbouring Raleigh will keep your tastebuds occupied.

Meanwhile, back at the convention, you can test your CW sending, and beat Geoff Pages VK2BYY next year. Or have a go at the scramble, and topple Grahame O'Brien VK2FA.

This year, the prize giving became an event in itself. Would Alan Savins VK2EFM have the energy to collect yet another award? Alan's a champion at Talk-Ins and 2m Mobile Hunts. He also won the 40m Fun Event and spotted the fault in the circuit diagram. Looks like he'll soon be able to build an "award" winning house!

Geoff VK2BYY is another hot contender. He won the 7meg hunt and correctly guessed, or maybe, calculated, one of the "capacitance in the bottle" competitions. Glenn English VK2JPR drew with Paul Mainey VK2KTT in the first Pedestrian Hunt, but took first prize in the second hunt.

The resonant frequency of the antenna was correctly judged by John Williams VK2BUI. His eagle eyes also sorted out how many "capacitors there were in the bottle", while his XYL took out the ladies' lucky door prize.

Rodney Somerville VK2URK won the technical quiz and the second "guess the capacitance in the bottle" competition. Viki's first puzzle was deciphered by Robyn Golden XYL-DGT, who also won the Easter cake raffle. Marie Warwick and Karen O'Brien (a VK2FA harmonic) found the duck in the second puzzle.

We hear the staff at North Ryde Post Office witnessed the king of jelly beans, Ron Swallow VK2GO's prize firsthand. Almost 263 beans burst from the padded postbag after their harrowing trip with our postal service. He'd forgotten he'd

The hounds and foxes on good terms before the hunt.

entered the competition!

The Easter Bunny raffle was won by Joan Colley of Coffs Harbour. A not-so-remarkable feat for a woman who's fostered 34 kids.

Alan VK2EFM did at least allow his father, Merv VK2DMS, to take home one prize - the gents' lucky door prize - although, of course, Merv couldn't be the fox along with Brian Slarke VK2ZCQ and win events at the same time! This slippery duo is determined to keep the fox hunt tradition alive. As usual, next year they will come up with more diabolical ways of eluding the hounds.

Henry Lundell VK2ZHE was surprised at his change of luck when he won the Planet desk lamp raffle. Everyone else was amazed that he had been persuaded to part with his money!

The 1991 *ARRL Handbook*, donated by Coffs Harbour Electronics, was won jointly by Arnold Austin VK2ADA and Brian VK2ZCQ. They're still arguing over who should get which pages.

On Sunday night, after the presentation of prizes, the crew retired to the Chinese restaurant in the bowling club for the traditional farewell feast.

If you don't win any prizes at the convention, you could always vent your frustration canoeing the Bellinger River on Easter Monday. Glide through clear water, observing eels and catfish at play. See blue cranes lifting off against a backdrop of rainforest trees, eucalypts and tree ferns. After a barbecue lunch, there's a no-holds-barred race down the home stretch.

So, next Easter, remember Urunga. Come and join in the oldest convention in Australia, and holiday on the best strip of coast in New South Wales. There's plenty for you and your XYL!

ar

The XYLs enjoy a lull before lunch. From left: June VK2ADA, Marilyn VK2BUI, Elva XYL of the late VK2EP, and Robyn VK2DGT.

Urunga Radio Convention 1991: Technical Quiz

Callsign/Name:

1. How many pins are on the base of an 807 valve? Answer:
2. If an amateur used 7.12MHz on 40m, 21.47MHz on 15m, what frequency would be used on 20m? Answer:
3. An alternator with fixed field excitation is supplying 240v at 50Hz to a 100Ω load. If a 15μF capacitor is connected in parallel with the load, the output voltage will:
   (a) Not change
   (b) Increase
   (c) Decrease
   (d) Double in frequency
4. A 100w, 13.8v, 50Ω broadband HF PA stage using MRF 454 transistors would have a turns ratio on the output transformer of:
   (a) 1-1
   (b) 25-1
   (c) 4-1
   (d) 1-25
5. The callsign of the winner of the 1951 "Urunga Scrambles" was? Answer:
6. The original wheels fitted to the "FJ" Holden were:
   (a) 13"
   (b) 14"
   (c) square:
   (d) held on with 5 nuts
7. The callsign of the amateur here today said to have a one-kilowatt handshake? Answer:
8. What is 2 when it is 0 and 9? Answer:
9. What frequency in kHz has the same numerical value as its wavelength (l) in metres? Answer:
10. What is the frequency in Hz of the musical note A at concert pitch? Answer:
11. Which of the following was the CPU in the original "IBM PC"?
    (a) 6809
    (b) 6800
    (c) 8088
    (d) BC547
12. What is the charge of an electron?
    (a) $1.50 ea or 10 for Y1000
    (b) 1.6×10^{-19}
    (c) 6.02×10^{23}
    (d) $1E_0$
13. What is the typical material a Gunn diode is fabricated from?
    (a) Silicon
    (b) Germanium
    (c) Tri Nitro Toluene (TNT)
    (d) Gallium Arsenide
14. What is the total size (in terms of memory) of variables that can be defined in Turbo Pascal compiled upon a "286" type PC?
    (a) a little less than you always need
    (b) 640k
    (c) 64k
    (d) 170

15b. Name the most useful one and why?

16. How many "C cell" type batteries are used to power the original FT290R portable VHF transceiver? (Hint: foxhunters sometimes use these)
17. Given $I=I_0(e^{qV/kT}-1)$ is the current characteristic of a pn junction diode. What does the band on the diode case indicate?
    (a) That is a good one!
    (b) It is mourning for the valve it replaced
    (c) To signify which end is the cathode
    (d) To indicate the "safe" area for static-free handling
18. Given that optical-fibre-based telecommunications are replacing coaxial-cable-based systems, why is this so?
    (a) A dramatic shortage in low-loss coaxial cable due to increased 6mx activity, just ask John VK2BUI!!
    (b) Lower loss optical fibres. Typically 0.6dB/1km
    (c) Wideband response of coax
    (d) None of the above

The Story of the Erratic Hand-Held

KEITH GOOLEY VK5BGZ
LOT 15 TENAFEATE CRT
ONE TREE HILL 5114

WHAT FOLLOWS IS AN account of a problem with a wayward 2m hand-held transceiver, namely an Azden PCS-300.

In retrospect, I see now that it all started with a short in the battery charger socket and, as you well know, nicad batteries are capable of delivering quite a hefty current into a short circuit, sufficient to burn up wiring in a hand-held. But more of that later.

The burnt wiring was repaired, and all seemed well, or so I thought. A year or two later, the transceiver started acting strangely. After a few minutes correct operation from cold switch on, it gave the appearance of non-existent button pushes of the keypad. It would give spurious beeps on its piezoelectric buzzer, then, after a time, refuse to respond to the keypad at all. I thought the micro-controller might have gone U/S. I looked at the waveforms on the keypad scanning lines with a CRO, having verified that the clock oscillator was going okay. At first the waveforms looked fine with the micro scanning the keypad every five milliseconds or so. But, then the waveform started to become distorted and erratic, coincident with the spurious beeps. It had all the hallmarks of a crook micro-chip.

Contacting the agents in Sydney produced no satisfactory result. I contemplated getting a letter to the Japanese manufacturer translated into Japanese, but then saw an advertisement in *QST* magazine for Azden transceivers. The agent gave his address, naturally, so I wrote to the US and subsequently bought a new microchip for the rig.

All well now, you ask? Not so. They sent the wrong chip, didn't they? A fact I found out after laboriously removing the supposedly faulty chip and fitting the new one. The device comes in a 48-pin plastic leaded chip carrier for surface mounting. The replacement device caused the rig to act most strangely or to not act at all. A further check with the CRO revealed that the keypad scanning waveforms were on quite different pins from the original.

Another letter to the US brought a prompt response in the form of a replacement chip, this time the correct one. Remove the IC again, all 48 leads at 50,000 spacings, and fit the correct one. Turn the set on with trepidation, and oh joy! it worked. Then, after a short time, a spurious beep, and the same symptoms returned; lots of spurious beeps and erratic operation. Gloom!

Put the rig away and think about replacing the whole microcontroller and display board with hard-wired logic. But now I had a supposedly working microchip (the original), so I wired it up on a piece of copper-clad board with a clock crystal and power supply, and examined the keypad scanning lines. They were stable and solid as a rock for hours.

So, back to the rig itself. Something had to be causing those spurious beeps. Figure 1 shows part of the CPU circuit with the keypad. Remember those burned wires I mentioned at the beginning of this article? Well they were PVC insulated. When PVC burns, it gives off hydrochloric acid. I had noticed some tarnished screw heads some time after the burn up but I hadn't noticed the corrosion occurring between two solder pads on the back of the micro-keypad PCB until now. On looking at the transceiver again I saw the grey powder between the very closely spaced pads.

Using a stiff toothbrush to brush the corroded pads, and a number of others which looked suspicious, brought the unit back to life. The grey powder had lowered the resistance between one of the keypad scanning column lines and a row line to the extent that the CPU thought a button was being pressed at first intermittently, then continuously. Needless to say I was rather pleased after 18 months of despairing of ever getting the rig working properly again.

So, there we have it. Burning PVC gives off hydrochloric acid, which settles itself in minute amounts through the set and can cause all manner of problems. The lesson we can learn from this is, if PVC wire burns in a set, look for the corrosion effects of hydrochloric acid and don't be afraid to attack one of these sets using surface-mounted components with a soldering iron. With care, components can be successfully replaced.

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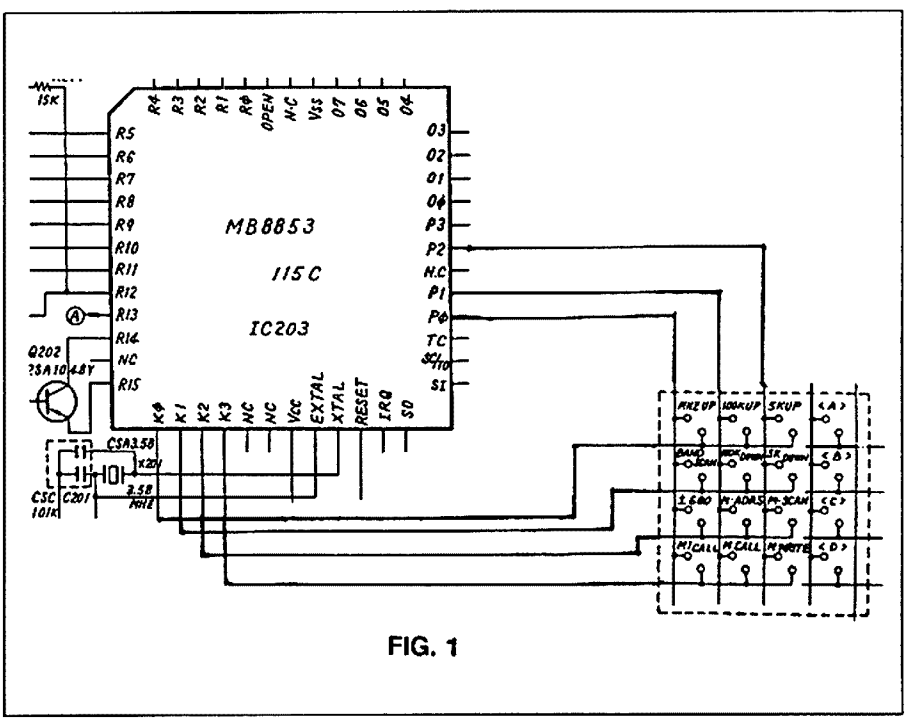

FIG. 1

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FT-411E 2M HAND-HELD

Superb performance on the 2M band with all of the 'top-of-the-line' features and reliability you know you can expect from Yaesu! Don't be fooled by unknown brands which can only offer some of these features...

— 144 to 148MHz tranceive operation, with enhanced receiver performance
— Ultra long life 1000mAH NiCd battery pack
— 2.5 watts RF output as standard, up to 5 watts with 12V DC (or FNB-11)
— Better than 0.16uV (12dB SINAD) sensitivity
— Programmable power saver for extended operating periods
— Keypad or dial frequency entry, with 5 selectable tuning rates
— 49 tunable memories which store repeater offsets
— Band, memory, priority, or limited-band scanning
— Carry case, belt clip, approved AC charger
— **2 Year Warranty!**

*** Now with enhanced receiver sensitivity, and improved strong signal handling!**

Cat D-3350

$449

YAESU

FT-4700RH DUALBAND MOBILE FM TRANSCEIVER

Features 50 watts output on 2 metres, and 40 watts output on 70cm (430-450MHz), with Full-duplex crossband operation or dual-band reception modes provided, so you can listen for calls on both bands simultaneously, or work someone on one band while also listening on the other band. The **BONUS** YSK-4700 extension cable allows the main body of the transciever to be installed remotely, while the front panel mounts conveniently on the dashboard. On the front panel the amber back-lit LCD shows both VHF and UHF frequencies and signal strengths, and all controls are back-lit for clear readability, with a dimmer switch for nightime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands. See ARA review Vol. 12 Issue 11 (Feb 1990), or A.R. review May '89.

D-3300

2 YEAR WARRANTY!

BONUS

- YSK-4700 front panel extension cable (Cat D-3301)
- 2m ⅝ λ mobile antenna (Cat D-4207)
- 70cm co-linear 4.5dB gain mobile antenna (Cat D-4030)

SAVE $83

$999

DICK SMITH ELECTRONICS

B1183/PB

DON'T BELIEVE US?

'The Best of the Best!"... That's what Yaesu and Dick Smith Electronics think of the FT-1000 deluxe HF all-mode transceiver. But don't believe us- read what the experts have to say...

On documentation

"clearly written and complete, and includes a complete set of schematics and many high quality photos" — QST "The quality of printing and presentation of this book is the best I have seen..." — AR

On operation

"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the Icom IC-781 or the Kenwood TS-950S." — ARA "...I found the FT-1000 easier to learn and use than any other radio in its class." — QST

On the receiver

"On receive, the performance was often beyond the limit of the latest professional measuring equipment, with no measurable trace whatsoever of synthesizer phase noise." — PW "...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." — QST* "The direct digital synthesizer works very well and produces receiver performance that sets new standards." — AR "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter — SSB

"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST "Reports were all very favourable, especially when using the speech processor." — AR "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

Transmitter — CW

"CW keying was a delight...power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." — AR "On CW the FT-1000 was absolutely faultless." — ARA "CW operation with the internal keyer is a breeze... in QSK CW operation, the rig has well shaped and weighted keying." — QST

Transmitter — RTTY/Packet

"Using the set on HF packet was an absolute pleasure..." — PW "RTTY and packet radio operation with the '1000 are straight forward..." — QST "Packet and RTTY modes were tried and proved just superb." — ARA

Conclusion

"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW "...the FT-1000 represents unbeatable value..." — AR "It is an excellent set worthy of accolades and rave." — ARA "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST*

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver, and easy to use controls put it far ahead of the competition. Wouldn't you rather be using the "Best of the Best"?

Cat D-3200

2 YEAR WARRANTY

$4995

including MD-1 desk mic

Magazines

ARA — Amateur Radio Action Vol. 13, No. 2
AR — Amateur Radio August 1990
PW — Practical Wireless January 1990
QST — ARRL QST March 1991 *(review with optional filters fitted)
Copies of these and other reviews plus our 12 page colour brochure are available upon request. Phone (008) 226610 or (02) 8882105.

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Serious Amateurs Deal With The Professionals

VHF/UHF BASE STATION ANTENNAS

These high quality, vertically polarised base station antennas are ideal for the discerning Amateur operating on the 2m, 70cm or 23cm bands. They're beautifully constructed Diamond brand antennas from Japan and provide high gain for maximum range. Constructed from robust F.R.P. tubing for excellent all-weather operation, with ground-plane radials for a clean radiation pattern.

2m ANTENNA F23A

Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x $^{5}/_{8}$ λco-linear
Cat D-4850

$199

2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x $^{5}/_{8}$λ(2m), 4 x $^{5}/_{8}$λ(70cm)
Cat D-4860

$199

23cm ANTENNA F-1230A

Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
Length: 3.06m
Type: 25 x ½ λco-linear
Cat D-4870

Limited Stocks!

$249

2m ½ WAVE BASE STATION ANTENNA

An outstanding value for money, compact, Australian made base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection and comes with a 5 year warranty.

Cat D-4820

MOBILE LINE

$49.95

HF/6m POWER/SWR METER

$199

A superb wideband SWR/Power meter which boasts quality Japanese construction and a truly accurate P.E.P. metering circuit (unlike many 'other' so called P.E.P. monitor systems). The Revex W502 features solid construction with an all-metal case and a large back-lit meter... and it covers the 1.8 to 60MHz range with less than 0.1dB insertion loss. With 20W, 200W and 2kW power ranges and LED indicators which show average or P.E.P. operation. Requires 13.8V DC @ 200mA power supply.

Cat D-1360

EA Jan, Feb, Mar '91

2m FM TRANSCEIVER KIT

This outstanding high performance FM transceiver can be used as either a mobile or base station on the 144-148MHz amateur band. It must be one of the easiest transceivers of its kind to build yet it comes loaded with advanced features.

Features like:

- Full PLL frequency synthesis
- 24 memory channels which store repeater shifts
- 25W or 5W switchable output
- 5kHz and 25kHz tuning steps
- Microprocessor control system
- Excessive SWR safety shut-down circuitry
- 0.15uV typical sensitivity at 12dB SINAD
- 30kHz selectivity at -60dB
- -60dB image rejection

NEW '91

At this price you can afford to take the challenge! Kit includes all components, hardware, heatsink, detailed construction and testing information, and a pre-punched silk screened front panel. Microphone is not supplied. YAESU D-2110 or D-2105 are recommended.

Cat K-6400

Only $399

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 8622 • Kotara 58 2092 • Liverpool 600 9888 • Maitland 33 7866 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 **ACT** • Belconnen (06) 253 1785 • Fyshwick 80 4944 **VIC** • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0899 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2366 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 232 711 • Melbourne City 399 Elizabeth St 328 6066 & 246 Bourke St 639 0396 • Richmond 426 1614 • Ringwood 879 5338 • Springvale 547 0522 **QLD** • Brisbane City 229 9377 •Buranda 391 6233 • Cairns 311 515 • Chermside 359 6255 • Redbank 286 5599 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0644 • **SA** • Adelaide City 223 4122 • Beverley 347 1900 • Elizabeth 255 6099 • Enfield 260 6088 • St. Marys 277 8977 **WA** • Cannington 451 8686 • Fremantle 335 9733 • Perth City 481 3281 • Midland 250 1460 • Northbridge 328 8944 **TAS** • Hobart 31 0800 **NT** • Stuart Park 81 1977

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VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169, MENINGIE 5264

All times are Universal Time Co-ordinated (UTC)

Beacons

At the recent SERG Convention in Mount Gambier, I was advised that VK3RMB on 432.535 has resumed operation. Also that the 70cm repeater VK3RBU is ready for operation.

Six Metres

Six metres has quietened down for many people but there are still places providing interesting contacts. One such place is Sarina where Ron VK4BRG lives. A condensed version of his log is as follows: DX FROM SARINA 30/3: 0836 KH6; 31/3: 0025 to 0041 K7KV, K6STI, P29JT; 0943 KH6; 2232 TI2HL. 1/4: 0118 to 0255 seven W7s, 0313 to 0354 N7LFX, WA7TDM, WA6BYA, K6FV, these represented a very late US opening; 0409 KL7NO and 0414 WL7X via auroral propagation with KL7NO beaming towards the Great Lakes region of Canada - no signals on the direct path! 0734 T31JA on CW worked by many VKs. Ron said they figured it out by next day that it was an April Fool's joke!! 0817 KH6IAA, 2237 YS1ECB, 2325 PJ2BR. 2/4: 0903 KH4AE Midway Is, 0921 NH6YG/KH3 Johnston Is, 2213 to 2226 eight Californian and Arizona stations, 2224 (Ron queries time) PJ9JT at 5x9 + 20dB running five watts. 3/4: 0838 KH6IAA, 2131 two W6s, 2149 WB6VIN, 0012 PJ2BR, 0211 ZL2TIC, 0933 V73AT, 0937 NI6E/KH6, 2337 N6XQ.

6/4: 0753 KH4AE, 0759 NI6E/KH6, 2159 YV4DDK, 2246 YV4AB, 2250 PJ9JT, 2317 W5GVE. 7/4: 0129 to 0157 N6CW, WA7JTM, W5VY, KF5RM, KB5KBY (?), WA5IYX, WB40SN Florida, 0205 three W7s, 0212 W5GVE, 0214 W5OZI, 0418 KF7NP and six W6s, 0846 NI6E/KH6, 2127 FO5HK, 2306 to 2341 eleven W6s. 8/4: 0831 NI6E/KH6 and again at 0802 on 9/4. 10/4: 0016 to 0026 VK6YU, VK6HK, VK6JJ. 11/4: 0848 V73AT, 0854 NI6E/KH6, 2210 N6XQ. 12/4: 0806 NI6E/KH6, 0836 AH3AB Johnston Is, 0837 KH6IAA, 0840 V73AT. From 13 to 18/4 KH6 and V73. 18/4: 2304 several W6s. 19 to 21/4: KH6, JA, KH3AE. 21/4: 2126 to 2203 nine W6s and W7s. 22/4: 0014 XE1GRR, 0023 to 0502 eighty-five (yes, 85) W6s and W7s! 22 to 26/4: KH6s. 26/4: isolated contact to W5GVE, 2155 to 2232 ZL1AKW, ZL3TIC, ZL2CD, ZL4OY all very strong. 27/4: 0050 to 0057 VK6KXW, VK6HK, VK6RO, 0150 NI6E/KH6. 28/4: 0632 NI6E/KH6, 2150 to 2207 ZL1ANJ, ZL3TIC, 2218 3D2PO, 2240 LU7DZ, 2257 ZP6XDW - possibly first ZP to VK. 29/4: 0204 NI6E/KH6, 0354 FO5NK, 2148 FO3BM, 2149 PJ9EE, 2152 3D2PO. 30/4: 0129 to 0133 VK6VB, VK6YU, VK6HK, 2230 V63JC, 2342 VK8ZWM, 2345 VS6BI heard but no two-way.

1/5: 0007 KG6UH/DU1, 2247 V63JC. 3/5: 0050 V73BQ, ZL, VK6, 3D2AG, V63. 4/5: 2055 V73AT, 2101 3D2PO. 5/5: 0014 to 0208 six W6 and W7. 6/5: 0158 to 0233 five W6. 7/5: 2221 KG6DX. 16/5: 0450 to 0503 three W6, 0753 KH6IAA, 2238 KG6SL/KHO. 22/5: 0056 to 0135 WA7FPO, WA7CJO, WA7TDZ, KF7NP, NN7K, KF0AH, KG7CE, KB6IGC, N6XQ; 2255 KG6DX.

Ron commented that the contacts to the USA on 22/5 were via an Es link-up at their end and thus were very interesting and unpredictable openings to a variety of locations. Also, he was very happy to work ZP and LU, although he had to work hard with the latter. He hoped he could work JT1CO, who was scheduled to operate from Mongolia for two weeks commencing 3/6/91.

A report on 28.885MHz said that on 3/6 between 0105 and 0130 JU1JA operating a DXpedition from Mongolia had heard the VK3SIX beacon on 50.053MHz, but no contact was made with any VK stations. This report came via JA8RC and VK3OT.

Six-Metre DXCC

From the SMIRK Six Shooter Newsletter comes advice of 18 recipients of the ARRL DXCC AWARD. Number 1 was awarded to K5FF, 2-W5FF, 3-VE1YX, 4-JA4MBM, 5-JA1BK, 6-W2CAP/1, 7-K5CM, 8-K8WKZ, 9-K4CKS, 10-WA1OUB, 11-KA1PE, 12-K1JRW, 13-JA1VOK, 14-JA3EGE, 15-JE1BMJ, 16-JE2KCP, 17-W4CKD/8 and 18-JA2BZY, JA4MBM being the first Asian operator to achieve DXCC status, SMIRK is awarding a special plaque to him and will do likewise to the first recipient of DXCC in each continent. These plaques are available because Hal Lund ZS6WB some time ago established a fund for this purpose. LU3EX has achieved DXCC, but the ARRL awaits his QSL cards.

Two Metres and Above

Aircraft Enhancement

Ron VK3AFW advises aircraft enhancement contacts continue to be made from Melbourne to VK1 and VK2 on 144.200 and 432.200MHz between 2200 and 2300 each Saturday and Sunday. If you wish to participate, you could find any of the following on air: VK1AU, VK1BG, VK1VP, VK2ARA, VK2ZRS, VK2ZAB, VK3HQ, VK3AMZ, VK3AFW and VK3XRS.

During the period 2245 to 2315 on Mondays, Wednesdays and Fridays, Gordon VK2ZAB looks for and works VK4s using this mode. Some VK4 signals have been heard by Arie VK3AMZ despite being about 30 degrees too far east for best results.

Ron says Adelaide stations should be able to use this mode to work country stations in VK2, VK3 and VK5, but their effort need to be organised. The Melbourne path may be difficult due to improper alignment of the flight paths.

Tropospheric

Andrew VK7ZHA provides the Tasmanian end for continuing weekday morning contacts on 144.100 CW to Ron VK3AFW with signals averaging S2/3 with QSB. Others to join in are Mike VK3BDL, Ian VK3ALZ and Rodger VK3XRS.

Meteor

One 10/5 meteor propagation tests were conducted between VK4ZKR and VK1BG. A number of pings were heard, but no QSOs were completed. Ron VK3AFW said during this time two longer-than-usual bursts of pings produced one-and-a-half complete callsigns at his location.

EME Contacts

Ron VK3AFW reports that on 11/5 Arie VK3AMZ completed his 34th EME contact by working W7VXW on 144.008MHz. Ian VK1BG copied W5UN and heard two other stations around 0200 on 19/5.

Doug VK3UM reports that for some time he had been waiting to work VS6BI, and finally managed a contact just before 0500 on 19/5 when Faraday rotation came good and he completed the contact in 90 seconds for one of his fastest contacts on EME.

On 18/9-5 Doug said moonrise to North America was poor. Good activity, but deep fading libration and cross polarisation changing rapidly. Europe was much better, with consistent signals.

18/5: 0200 WB0GGM, 0233 K2UYH, 0245 ZL3AAD, 0315 WB0GGM (repeat with 100 watts to four yagis), 0900 UT5DL, 0916 DF3RU, 0924 SM2CEW, 0948 LA8LF, 1000 DF9CY and 1020 DL9NDD. 19/5: 0248 ZL3AAD, 0259 V3QBVL, 0325 WA9FWD, 0345 JL1CZG, 0409 K1RQG, 0458 VS6BI, 0932 SM2CEW, 1006 LA8LF. Signals varied from 339 to 559, which indicates Doug's eight-bay array is working well.

Closure

About a month after you read this it will be necessary to be vigilant on six metres as the spring equinox approaches, bringing with it the possibility of more F2 long-distance contacts. Don't despair, there will be some!

Closing with two thoughts for the month: "Money may not buy happiness, but it buys the kind of misery you can enjoy", and "A budget is what you stay within if you go without." 73 from The Voice by the Lake. ar

50-54MHz DX Standings

DXCC countries based on information received up to 5 June 1991. Crossband totals are those not duplicated by six-metre two-way contacts.

Column 1: 50/52MHz two-way confirmed contacts
Column 2: 50/52 MHz two-way worked
Column 3: Crossband 50/52MHz to 28MHz confirmed
Column 4: Crossband 50/52MHz to 28MHz worked
Column 5: Countries heard on 50/52MHz.

Callsign	1	2	3	4	5
VK4ZJB	78	78		4	
VK3OT	76	81			2
VK4BRG	71	79			
VK2BA	62	63		4	
VK2QF	62	63			
VK4ALM	62	66			
VK4ZAL	55	58			
VK4ZNC	53	61			
VK8ZLX	45	60			
VK3AMK	45	47			
VK8GB	42	42			13
VK3AWY	34	36			
VK5RO	31	34			
VK3NM	31	34			
VK5LP	31	33			9
VK3AUI	27	28			
VK6RO	27	28		4	14
VK2DDG	25	26		2	13
VK6HK	23	32		1	3
VK4KHZ	23	24			
VK3XO	23	25			2
VK4TL	22	23			
VK2KAY	21	23			
VK2BNN	20	21			
VK4BJE	19	25			
VK7JG	18	20			2
VK3TU	17	19			
VK4AYX	17	17			
VK9XT	17	17		4	
VK2ZRU	16	19		4	
VK9YT	12	14			
VK6OX	10	10		1	1
VK5KL	6	11		1	14
Overseas					
JA2TTO	48	48		9	
YJ8RG	25	25			

The next list is planned for the February 1992 issue. Copy to me by 15 December 1991, please. Some amateurs have responded with the photocopies or certified lists of their QSLs as I earlier requested. I await the others, please. If you cannot obtain ready access to a photocopier, then why no have your cards vetted and certified by two other amateurs, preferably WIA members.

A perusal of the ARRL DXCC Countries List as it appears in the WIA Call Book indicates that for DXCC purposes, contacts with VK9 (New Guinea) prior to 15/9/75 and P29 (Papua New Guinea) after that date constitute separate countries!

Originally I doubted this claim, although it appears to be so stated in the call book. John VK4ZJB wrote to the ARRL and its reply indicated it would accept two countries, one deleted and one current. Earlier listings in QST apparently showed information such as 310/314, which means 310 current countries or with deletions 314. I am told present lists show only the full total, eg 314.

On that basis it seems that for the Standing List two claims for that country will be acceptable, either side of 15/9/75. Those who have already claimed both have been duly credited. Those who wish to claim need to send proof of contacts. ar

AMSAT

Maurie Hooper VK5EA
11 Richland Road Newton 5074
Packet: VK5EA@VK5WI

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
Information Nets
AMSAT Australia
Control: VK5AGR
Amateur check in: 0945 UTC
Sunday bulletin commences: 1000 UTC
Primary frequency: 3.685MHz
Secondary frequency: 7.064MHz
(7.064MHz is the frequency presently in use)

AMSAT SW Pacific 2200 UTC Saturday, 14.282MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA divisional broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has over 310 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001.

The Newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal

RS 12/13 FREQUENCIES

HR AMSAT NEWS SERVICE BULLETIN 158 02 FROM AMSAT HQ
SILVER SPRING, MD JUNE 18, 1991
TO ALL RADIO ANATEURS BT

RS 12/13 Radio Frequency Guide & Beacon Data

		RS 12	RS 13
MODE "A"	uplink	146.910-146.990	145.590-146.000
	downlink	29.410- 29.490	29.490- 29.500
	beacon	29.4081 (or 29.4643)	29.4552 (or 29.5043)
MODE "K"	uplink	21.210- 21.290	21.290- 21.300
	downlink	29.410- 29.490	29.490- 29.500
	beacon	29.4081 (or 29.4843)	29.4552 (or 29.5043)
MODE "T"	uplink	21.210- 21.290	21.250- 21.300
	downlink	145.910-145.990	145.950-146.000
	beacon	145.9125 (or 145.9587)	145.8622 (or 145.9083)
MODE "KA"	uplink	21.210- 21.290	21.290- 21.300
		145.910-145.990	145.950-146.000
	downlink	29.410- 29.490	29.490- 29.500
	beacon	29.4081 (or 29.4843)	29.4552 (or 29.5043)
MODE "KT"	uplink	21.210- 21.290	21.290- 21.300
	downlink	29.410- 29.490	29.490- 29.500
		145.910-145.990	145.990-146.000
	beacon	29.4081 (or 29.4543)	29.4552 (or 29.5043)
		145.9125 (or 145.9587)	145.8522 (or 145.9053)

Autoanswer "Robot"

MODES	A; K; T; KA; KT	A; K; T; KA; KT
uplink	21.1291 and/or 145.8308	21.1356 and/or 146.6403
downlink	29.4543 and/or 146.9557	29.5043 and/or 146.9063

TECHNICAL DATA

	RS 12	RS 13
DC POWER:		
All system OFF	4.6 W	3.9 W
All system ON (max. output)	35 W	26 W
RF OUTPUT POWER:		
Beacon and "Robot"(low/high)	0.45/1.2 W	0.45/1.2 W
Transponder TX (29 or 145)	about 8 W	about 8 W

donation of $10 per item to AMSAT Australia, together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services, send a SASE to Graham.

UoSAT-2 News (from SpaceNews)

Here is a recent UoSAT-2 On-Board Computer (OBC) status report:

UoSAT-2 OBC Status Information

Diary Operating System V3.1 SMH MLJM MSH

Today's date is 29/6/91 (Saturday)
Time is 0:50:10 UTC
Auto Mode is selected
Spin Period is - 304
Z Mag firings = 0
+ SPIN firings = 140
- SPIN firings = 80
SEU count = 1502
RAM WASH pointer at D07D
WOD commenced 29/6/91 AT 0:0:8
with channels 10, 11, 19, 29
Last cmnd was 109 TO 0, 0
Attitude control initiated, mode 1
Data collection in progress

In addition to this status report, UoSAT-2's telemetry report indicated a total of seven primary OBC errors and a total space dust count of 166 during the 4.84-second telemetry sample period. These values are higher than "normal" and can probably be attributed to high solar activity.

The space dust experiment is similar to what was flown on the GIOTTO spacecraft and was built by a group of students at the University of Kent, England. It uses a dialectric diaphragm which, when punctured by a large particle, discharges the capacitance associated with it, thereby indicating the impact. This works in conjunction with a piezo electric microphone which detects particles of a smaller size.

WO-18 Status Report

HR AMSAT News Service Bulletin 173.02 from AMSAT HQ

Silver Springs, MD 22 June 1991

To all radio amateurs BT

WA3PSD provided A Webersat-Oscar-18 Status Report

There has been a bit of unexpected behaviour observed on WO-18 the past week. If it continues so, it will be quite a timely development. Rotation about the Z-axis has begun to accelerate. For a period of months, the spin rate seemed stable at about one rotation every 21 minutes. It clearly was not. The latest whole orbit data collection unmistakably indicates a change to around one rotation every 10 minutes. This casts doubt on the accuracy of what had been evolving as the most popular theory (asymmetry in shape and moment-of-inertia of the spacecraft) to explain why spin slowed originally. It's too soon to discard it, though. But no matter. This is good news. ALL passes across the magnetic equator now are yielding earth-pointing attitudes. And, perhaps not surprisingly, we now have aboard and in memory five separate valid (non-dark, non-washed-out, ie detailed) pictures. The best I've seen so far is picture #6, which is the usual wispy clouds (store-and-forward meteorology from space with imaging equipment priced less than $10,000 IS possible). We will try to default to it as often as possible during the next few days, but if your QTH is within a footprint including Utah, you will also be getting the other pictures as we download 'em to see what's in 'em. We will always try to reset picture #6 transmitting before the end of our passes here. If you are on the east coast, picture #6 will probably be what you see. We intend to start shooting more within a week, but we'll always try to keep picture #6 or something interesting coming down as long as the Single-Event-Upsets (SEU) stay out of the synch fields.

And, now the really good news. Again, if this rotation sustains itself, it produces a substantial increase in the probabilities that we will have had a sunward pointing attitude at some point during shadowing in the eclipse on 11 July. I had intended containing our shoot conditions during the event to large current generation from the +Y array, and very low amounts from the other arrays. With essentially no rotation before, we were stuck with just hoping to be lucky enough to have +Y pointing properly during shadow traversal - and shooting then. With this new rotation rate, there are better chances for that to happen. I expected to use a nine through three mix of pictures with nine constrained to shoot the sun (with only 10 seconds between picture constraint waits) and three pictures constrained to shoot the Earth with what will be lower light levels. Picture #9 will shoot with different camera iris values. We certainly know more now about the iris than we did, but we don't have much experience shooting the sun so nine different values are probably in order.

Enjoy. 73s, Chris Williams WA3PSD
WO-18 Operations Manager

ar

```
      2-Line Orbital Elements   (Set 180.AMSAT)  June 29, 1991

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00  0  0 BBBBB.BBBBBBBB  .CCCCCCCC  00000-0  00000-0 0  DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MMANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM


AO-10
1 14129U 83 58  B 91173.06914142 -.00000000  00000-0  99998-4 0  6762
2 14129  26.7941 139.3114 6032796 252.4433  36.2637  2.05882678 32349
UO-11
1 14781U 84 21  B 91174.09087683  .00001883  00000-0  34349-3 0   323
2 14781  97.8972 218.7097 0013099 148.4442 213.7874 14.67044936330314
RS-10/11
1 18129U 87 54  A 91175.05919894  .00000080  00000-0  81903-4 0  6908
2 18129  82.9259  53.7824 0011792 160.1059 200.0562 13.72194566200537
AO-13
1 19216U 88 51  B 91173.76313884 -.00000192  00000-0  86587-3 0  2758
2 19216  56.7478  87.7149 7196447 257.5679  20.2672  2.09706085 23149
FO-20
1 20480U 90 13  C 91176.39441776  .00000018  00000-0  70648-4 0  2342
2 20480  99.0290 156.1836 0640184 285.2432  68.9674 12.83183140 64485
AO-21
1 21087U          91175.16264941  .00000120  00000-0  11471-3 0   939
2 21087  82.9417 228.5694 0033826 239.4483 120.3325 13.74390104 19986
RS-12/13
1 21089U 91  7  A 91174.83113993  .00000136  00000-0  13233-3 0   935
2 21089  82.9234  99.1855 0027752 262.8262  97.1736 13.73906619 19058
UO-14
1 20437U 90  5  B 91174.73368879  .00000567  00000-0  23656-3 0  3944
2 20437  98.6652 254.1473 0011185 144.4280 216.7823 14.29159191 73928
AO-16
1 20439U 90  5  D 91174.41835947  .00000521  00000-0  22081-3 0  2925
2 20439  98.6714 254.1774 0011992 142.5616 217.6467 14.29243349 73581
DO-17
1 20440U 90  5  E 91174.53824828  .00000578  00000-0  24279-3 0  2927
2 20440  98.6721 254.3469 0011938 142.1292 218.0731 14.29330727 73900
WO-18
1 20441U 90  5  F 91176.76813716  .00000492  00000-0  20669-3 0  2892
2 20441  98.6716 255.6194 0012698 139.7941 220.4173 14.29373111 74080
LO-19
1 20442U 90  5  G 91172.52230334  .00000563  00000-0  23638-3 0  2899
2 20442  98.6718 252.4514 0012822 149.1026 211.0911 14.29447928 73627
MIR
1 16609U 86 17  A 91174.59167206  .00023940  00000-0  32068-3 0  6504
2 16609  51.6036 255.1688 0004049  27.7163 332.4614 16.57846771306163
HUBBLE
1 20580U          91175.00187178  .00003199  00000-0  32553-3 0  4785
2 20580  28.4712  38.6836 0005126  29.1632 330.9244 14.87941341 63333
```

REPEATER LINK

WILL MCGHIE VK6UU @ VK6BBS
21 WATERLOO CR LESMURDIE 6076

Regulation Changes

The WIA and, in particular, FTAC, have been tackling the difficult problem of repeater regulation over the past couple of years.

Having been a part of the effort to see sensible repeater regulations adopted, I can sympathise with the WIA and its efforts to bring about change. Not just the adoption of more regulations to overcome regulation anomalies, but genuine change in the concept of what the regulations should be.

The future is at long last looking brighter than it has ever been. Rather than regulate an experimental hobby in finite detail, broaden the regulations to apply only to frequencies, emissions, message content and interference, let the amateurs themselves, via their elected representatives, decide the fine detail.

So many problems with the present regulation system exist that experimental repeaters and link systems are buried under a mountain of regulations. To give one such example: building a link system between two or more repeaters is complex, at least that is the way I have found it to be. With one side of the UHF link built and under test before it is placed into service, the amateur designer cannot place it on air and talk through it. A link can only be used to talk to another link, not an amateur using the UHF link frequency direct. Amateurs may not be aware that 420.0MHz to 421.0MHz and 440.0MHz to 441.MHz are not for normal amateur use. An amateur licensed to operate on this band can in effect not use this portion of the band. Doing so may place you on a repeater link frequency and, as a result, in communication with a novice operator using a 2m repeater, linked to another 2m repeater.

This restriction of not being permitted to use a link frequency to talk into a repeater needs further thought. Say you live between two linked repeaters but have poor access to one or both of these repeaters, or UHF equipment only. However, the UHF link, due to its directional antennas, has a good signal at your QTH. As the regulation now stands you cannot use the UHF link frequency to talk into the repeaters.

The bottom line to all this is that it is contrary to what amateur radio is all about - experimentation. The effort that John Martin (Chairman of FTAC) is putting in to sort this situation out is greatly appreciated in VK6.

There must be many repeater groups and individuals out there planning and building link systems for some of the existing repeater network that already is in place.

How about sharing some of your ideas with the rest of the amateur world? Put your concepts on paper and send them to me for inclusion in Repeater Link.

In VK6 considerable time has been spent on discussing what repeaters should be linked, how they are to be linked, and how best to interface with the end user, you the amateur. It may sound easy to link the odd repeater together, but it has not proved to be, at least not in VK6. So many options present themselves. To give an example: when linking two repeaters together, firstly are they suitable to be linked in terms of the type of use they receive? Should the link be permanent or user determined? Are there times when each of these options may be required? A user-determined link may be required to be linked permanently for a period of time. If a link is user determined, once the QSO has finished should it be left up to the amateurs to then disconnect the link, or should it time-out after a period of no use? What code control will be required by the amateur to understand in order to access link systems?

Apart from a lengthy paper from Will Scott VK4XP, I have seen no other ideas on all these interesting options. Any thoughts on how your repeater group is looking at linking could advantage other repeater groups.

Limited Access

If I told you that a new amateur transceiver was coming on the market, but it covered only a third of the band, what would you think?

Well, this silly situation already exists with transceivers for the 70cm band. They don't cover the whole 30MHz from 420MHz to 450MHz, but only 10MHz from 430MHz to 440MHz. Even though these transceivers are capable of operating on the whole 70cm band, they are deliberately restricted by the programming of the internal CPU. In most cases, it is a simple hardware change by removing or adding a diode or two to gain access to the whole 70cm band, so why the limited access?

The reason is that, with the restriction removed, these transceivers can now operate outside the amateur band, and be used in a service they are not licensed for.

My interest in having access to the complete 70cm band is for the development and testing of link systems, which operate between 420.0MHz to 421.0MHz and 440.0MHz to 441.MHz. This is a legitimate use, but is it legal?

The next generation of transceivers may have internal masking of the CPU chips that will be impossible to modify. What you get frequency coverage wise is all you can get. To whoever decides these things, please allow access to the whole 70cm band and not just a third of it.

The ridiculous outcome of not having access to the entire band could be that amateur radio may lose a part of the 70cm band. ar

SPOTLIGHT ON SWLING

BY ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

The first of July saw a significant alteration to the worldwide maritime allocations. As mentioned in last month's column, the International Telecommunications Union agreed that there would be changes internationally on that date to HF maritime allocations. Already I have noticed that the Coast Station telex portions have shifted a few hundred kilohertz downwards in each allocation. Now they are within 50kHz or less from the ship's telex allocations.

The former sub-bands are quiet, with a few A1A marker signals from fixed stations slowly appearing. Only a few telex stations are left there, presumably waiting for new frequencies or crystals. The Radphone allocations have increased slightly, with the channel allocations altering by a few hundred Hertz. For example, I have noted VIT in Townsville listening for calls on 8176kHz, at very good levels here in Launceston.

As mentioned last month, Kol Israel in Jerusalem was going to significantly reduce English language broadcasts on shortwave. For a while, there were reports that this was not going to happen. But a spokesperson for Kol Israel confirmed that the cuts were very likely to go ahead. The reasons for the cutbacks are budgetary. There were hopes, even then, that there would be a last-minute reprieve of the English language service, particularly in view of the outcry from overseas listeners.

Another international station on shortwave closed down recently. Radio Peace and Progress in Moscow, which has been on-air since 1963, closed down suddenly at the end of April. Most of the programmers have been absorbed into Radio Moscow, or have commenced work in the new independent stations which have been rapidly springing up within the USSR. This station was operated by the Central Committee of the Communist Party, whilst Radio Moscow was a part of the Soviet broadcasting service. They broadcast mainly in English, Spanish, Portuguese, Creole, Chinese and Guarani (a South American dialect). Surprisingly, the majority of their programming was in Chinese.

And, while we are on the Soviet Union, there have been developments on the broad-

casting scene. Some independent stations are springing up, particularly in Russia and the Baltic republics. The most popular station in St Petersburg (formerly Leningrad) is Radio Rock on FM. Although the sender is near that city, the studio is actually in Oslo, Norway. The audio is fed by satellite to the sender. The station will probably have opened the sender within Moscow by now. They aim to have a string of stations across the USSR. The station was started by former staffers at Radio Moscow, Radio Peace & Progress and domestic radio networks and, as its title suggests, broadcasts rock music in a commercial format.

Other entrepreneurs have plans to also start commercial broadcasts by leasing time from the existing Soviet transmitters, many of whom were former jamming senders. One American/Soviet effort is reportedly beginning in September. However, there were plans for a joint venture on Radio Moscow last year for a semi-commercial format on the North American Service which, for some reason, didn't materialise. Radio Moscow World Service has been airing commercials for Soviet enterprises for a couple of years now.

It is significant that there continues to be cutbacks in Radio Moscow programming, with several languages being axed. Several Indian and African languages, plus Tagalog used in the Philippines, haven't been heard lately. As well, many language sessions have been reduced by half.

Well, that is all for this month. Don't forget, if you do have any news, please drop me a line to the above address, or leave a message on packet as follows - VK7RH @ VK7BE-1. Until next time, the very best of listening, and 73.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

This month we are given the opportunity to polish our procedures with the help of the RD contest on 17th and 18th. I have been listening to the broadcasts lately (on account of rain) and know that both VK3 and VK2 are encouraging members to participate for their respective states, and I assume other states have similar aims. The RD contest also provides morsiacs with an ideal environment in which to test and improve our operating procedures (as I have expounded over the past couple of months), where there is a friendly and relaxed atmosphere in the midst of a world-class competition. Beginners will find this an easy way to recognise callsigns and especially numbers of which there are plenty!

If you have not tried your hand at contesting in the past, this contest is an excellent one to begin with, provided you prepare yourself and your equipment accordingly. You have only two weeks, so the first thing to do is READ THE RULES. *(See page 40)* Once you understand the rules you can sort out the paperwork that you will need "on the day". Depending on the contest and the individual rules, you will need log sheets with the columns ruled out as appropriate. I prefer to use separate sheets for each band, and if (by some improbable chance) I wanted to work both Cw and voice, I would use separate sheets for each mode as well. It is then quite simple to scan (by eye) each band's sheet for duplicates as you are listening to callsigns on the air. I think that this way is faster than using a computer, as your brain does not need to have the information entered by hand for each contact, so your hands can be occupied with the keyer and radio controls at all times, and with a pen when receiving. I'm not trying to give the impression that the RD is an especially hard contest regarding workload; it isn't. In fact, I usually manage a rag-chew now and then, especially late at night, but it is worthwhile getting the paperwork right first.

Two weeks (assuming you are reading this at the beginning of the month) should be ample time to ensure that your station is ready for anything. Once you have decided which bands you will work, you will need to check the antennas for each band, making sure you can switch between them easily, and that they are tuned for the section of the band you will be using. If you don't have tuned antennas for each band you can build simple dipoles in a day or two. I suggest dipoles because you can cut two or three sets for each feedline and hang them all from a single mast. I don't recommend beams or other highly directional antennas for contests because of the time needed to swing them. A delta loop on 7MHz or higher is excellent, but unless you are working overseas dog-piles, a beam always seems to be pointed the wrong way whenever you hear a station that you want to contact in a hurry. I have one dipole tuned to 1820 and 3520kHz, and one dual dipole (one feeder) on 40 and 30 metres. For this contest I would add a delta loop for 20 and 15, and maybe also 10 metres, as this seems to work best at this location. Whatever you use, it is essential that you be able to change bands quickly with as little fuss as possible, even to the extent of using a tuner and having all the settings tabled for reference, as I do with my long-wire, my favourite antenna.

I usually arrange to have two keyers ready to use with fresh batteries, as I can leave both connected to the rig at the same time, with a straight key for further backup. My rig is run off the mains, but I can connect batteries in about five seconds if needed. I don't have a spare rig, unfortunately, unless you count the homebrew QRP! If your rig has memories, you can enter appropriate frequencies for each band into the memories to further save time when operating.

Whether you enter the contest or not, I hope this has been helpful to you in setting up your station for any event, be it contest or emergency. But one last point ... no matter how small ... SEND IN YOUR LOG or, for this contest, as indicated by the new rules, you need only to send in your SUMMARY SHEET!! You will still have to KEEP a log in case it is called up by the contest co-ordinator to prove your summary sheet.

VK4 Networking on CW

Slow morse is alive and well in VK4 with three clubs and one individual operator putting out sessions four nights a week on 3535kHz from various locations throughout the state. It was hoped that sufficient clubs would volunteer to cover seven nights a week, but this did not eventuate, most pleading lack of interest among members, or operators discouraged when nobody came up on callbacks.

However, when you listen around in the evenings on 80m there seems to be plenty of interest in CW, with some clubs going to great lengths to provide training for local examination candidates. The potential is there for a statewide network of CW enthusiasts at all levels of proficiency.

The reason for appearing in this column is to seek out CW operators who would like to call back on the regular session with signal reports and general feedback. Sessions run for approximately 30 minutes, starting at 0930 UTC (some stations go to 0830 during daylight savings) followed by a brief callback on SSB. Listen for VK4WIT (Monday), VK4WCH (Wednesday), VK4AV (Thursday), or VK4WIS (Sunday). (Note - not as published in *AR).* Frequency 3535kHz. Also needed are operators in VK4 to make use of the "free" nights (Tuesday, Friday and Saturday) either in an ongoing capacity, or for a limited period. Possible uses are - another 5wpm to 12wpm session, a higher speed session or a CW training net. Ideas and suggestions regarding Morse Code training, methods of generating morse practice sessions and other items of interest will be welcomed.

Contact the Slow Morse co-ordinator via TARC, PO Box 964, GPO Townsville 4810, or call in on one of the sessions.

Sally Grattidge, VK4MDG

More on QSK (Break-In) from Tim VK4CBP

"I use a TS-430 here and it does not have QSK, only the VOX setup. Well, the relays do seem to make lots of noise, and that does make one not use short delay times for fear of doing

some damage. Anyway, recently I did a modification to the 430 which stopped the attenuator relay activating each time one went from Tx to Rx. It is now much quieter to use, and it must save the relays a bit, too. While not quite QSK, it is not bad! Anyway, the modification is quite simple, and it entails cutting the resistor, R28 (2.2k) on the X41-1470 switch unit, just behind the attenuator switch on the front panel.

I just thought some of your readers might be interested in doing this modification to make the 430 a lot smoother and quieter to use in the gentlemen's mode!

73, GIL VK3CQ
ar

HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93, DURAL 2158

June was not a good month for propagation. Comments were heard daily on the bands about: M-class flares, X-class flares, satellite porton events, polar cap absorptions, major storms. Auroras were sighted near both of the polar regions, and they were seen as far north as Sydney or Adelaide.

The average 100-watt DXer had some difficulty securing a DX contact in the single sideband mode. However, those who have not yet forgotten the ancient art of morse telegraphy had no difficulty picking up choice DX on any of the bands, including the WARC bands.

Here are a few active stations on the CW section of the band. Whilst I am only giving you a sample of 20 and 15 metres, all of the bands from 160 to 10 metres are producing good CW DX. 20 metres: 3B8, 4K1, 4S7, 9M2, A22, EA9, HZ1, OX3, PJ, PZ, TA, TL, UJ, ZD8 etc. 15 metres: 9X5, CO2, FH, HP, HZ1, JY, ST2, TF, TL, XV, ZD8, 3B8, 8R, CE0, D2, FY. As you can see, there is a good selection of pickings. All you have to do is this: dust off your old key or keyer, adjust your thinking, attitude and method of operation to DX, from a group concept to individual effort; hunting "on your own". You will be pleasantly surprised by the result. Good luck!

Afghanistan - YA

Good news for those who missed the previous YA0RR Russian expedition from this rare country.

IT9AZS and other Italian amateurs intend to operate from Kabul between 12 July and the beginning of August. There will be four operators, and the activity will be in SSB and CW. They hope to use amplifiers and a variety of vertical and wire antennas. The possible callsign could be YA0AS or T6AS. Favoured SSB frequencies are: 7080, 14180, 18142, 21280, 24942, 28580 and, on CW, 1kHz up from the bottom of the band segment. QSL will be via IT9AZS.

Myanmar (Burma) - XZ

Ed Kritsky NT2X, who has helped Romeo with his previous DXpeditions, gave some further details in the various DX outlets about Romeo's proposed activity. The expedition is definitely on. Additional documentation has arrived in Moscow from Burma, and according to news received at the very end of June, the documentation was presented to the ARRL DXCC committee and was accepted by them. It seems that it is up to Romeo and the international DX fraternity to make sure that adequate funds are secured in advance to make the expedition a success. Romeo arrived in the US at the end of June for a fund-raising activity tour. The Myanmar expedition is expected to take place in August or September of this year.

Angola - D2ACA

The most important DX activity in the month of June were the Russians, who operated from Angola as D2ACA, but later under their own callsign, prefixed with D2. They were very active on the 21 and 14MHz bands, but were heard also on other bands. The lower ends of the bands were used for some high-speed CW contacts. Propagation from VK did not favour Angola very much, and not many VKs or ZLs were able to contact them. Nets were "overloaded" with hopeful waiting queues. Amplifier problems also compounded the difficulties. DX sources said that the operation closed on 24 June. QSL goes to: LZ2DF Minchi I Petkoff, K Kukuvishky 15, 5600, Troyan, Bulgaria.

DX on 24MHz

Some time ago we reported that Graham VK6RO is quite active on this WARC band. Graham is now happy to report that he has worked 200 countries on this band. He has been on almost every day since December 1982. Here are a few interesting prefixed worked by him between April and the middle of June: ZT0, HB0, FW0, VP2, 9X5, FP, PY, A71, CU2, 9L2, JU1(JT), C21, HS1, XX9. Graham thinks he is the first VK to date who achieved this. Any challengers? So, if you feel that the 10-15-20-metres are crowded and there is no elbow room, please consider the WARC bands. Antennas are easy to make, and most modern "black boxes" have provision for WARC bands. The 24 and 18MHz bands have already proved their excellent DX capability.

Penguin Islands - ZS1

The ARRL DX Awards committee has accepted the recommendation of the DXAC and added the Penguin Islands to the DXCC list, which now stands at 323 countries. QSL cards will be accepted after 1 September 1991. The Penguin Islands are administered by South Africa and are situated off the west coast of Africa. Namibia (V51) separates the islands from the South African Republic. The last activity from these islands was in December 1990 as ZS9Z/1 and QSLs are handled by OH2BH.

South Georgia - VP8

John, operating from Bird Island in the South Georgia Group (see July *AR*), now has his own callsign: VP8CGK. Arrangements have been made for him to soon receive a three-and

beam, which will make contact with this rare DX station so much easier.

South Sandwich Islands - VP8

The postponed South Sandwich Islands expedition is on again (See Sept, Oct and Dec 1990 *AR*).

Jerry AA6BB/7 announced on 15MHz DX nets that eight operators will be leaving Port Stanley, Falkland Islands on 28 November, and start operation from South Thule Island on 5 December 1991. They were to be picked up by the research vessel *Abel J* on 20 December and return to Port Stanley on 28 December. The expedition will be active on CW, RTTY, SSB and other modes. Although there is some money from the last year's postponed event, donations are sought and recommended. Send money and QSL cards to AA6BB/7.

Future DX Activity

* Nick G0ACJ will be on Ascension Island until November 1991. He uses the callsign ZD8ACJ.
* Tom LA4LN and Hans LA1SP will go to the Faroe Islands early in August, and will sign with their own callsign prefixed by "OY". Note: you will find this system to be a general rule for stations operating from a European country.
* The International Baden-Powell DX Foundation will use the callsign C30EJA during July and August on all bands.
* There will be a DX conference in Leningrad (or St Petersburg if the city's mayor has his way) between 2 and 8 August. The special event call 4L3FS will be used during those days.
* Look for FY/N4QDX and FY/KD3FK. Jan and Beth are missionaries in French Guyana. They are operating barefoot and use a Mosley Beam. QSL direct only to Jan Weaver, 35 bis Cite Cesaire, F-97300, Cayenne, French Guyana, South America.
* VE7NH/MM left Vancouver on 6 June and will arrive in Hawaii on 6 July. Doug hopes to operate from Kingmann Reef (KH5K) and Palmyra Island (KH5). QSL to the VE7 QSL Bureau.
* TL8FD is operating from the Central African Republic until the end of August. QSL to: Pat, Box 265, F-67504, Haguenau, France.
* DK4UW will be active from Corsica Island as from 2 September as TK/DK4UW.
* Bing VK2BCH advised me that he will return to Rotuma in September or October this year.

Interesting QSOs and QSL Information

Note: callsign, name, frequency, mode, UTC, month of QSO.

ZC4RF-Bob-14031-CW-0535-June. QSL to: GO3YP R T Francis, 42 Carmarthen Rd, Up Hatterley, Cheltenham, Glos GL51 5LA.

7X2FK-Mohamed-14041-CW-0454-June. QSL to: ARA QSL Service, Box 2 PO Algiers, Algeria.

FT4WC-14017-CW-1046-June. QSL to: PO Box 35, Villemandeur, 45700, France.

4J1FS-14001-CW-0639-May. QSL to: OH2BU Jari Jussila, Pilvijarvi, SF-02400, Kirkkonummi, Finland.

C30EUA-21027-CW-0500 QSL to: HB9MM USKA Section Vaudois, Box 3705, CH-1002, Lausanne, Switzerland.

XV2A-Mark-21295-SSB-0943-June. QSL to: JJ1TBB, Masumi Kawasaki, 4-36-10 Kasuga Cho, Nerima-Ku, Tokyo, 176, Japan.

CO2VG-Juan-21MHz-SSB-0405-May. QSL to: Juan A Viera, Box 9028, Habana 10900, Cuba.

V I 4 H B W

SPECIAL EVENT STATION

CELEBRATING

"THE WHALE FESTIVAL"

IN HERVEY BAY

P.O.BOX 829
HERVEY BAY 4655
QLD. AUSTRALIA

STATION	DATE			UTC	MHz	REPORT	MODE 2-WAY
	DAY	MONTH	YEAR				
SAMPLE							

GJ4KBM-Byron-21MHz-SSB-0941-April. QSL to: B Nelson, Les Marais, Route Du Marais, Saint Ouen, Jersey, UK.

7P8EG-Hans-28MHz-SSB-0737. QSL to: K0JZM Dennis M Luscomb, 510 Virgo St, Mission, TX 78572, USA.

FP5DX-Pat-14225-SSB-0627-June. QSL to: Box 4204, F-97500, Saint Pierre, France.

V63HS-Smitty-14244 SSB -1133 -June. QSL to: AL7JG via the Bureau.

5W1JQ-Harry-14254-SSB-0604-June. QSL to: DL1RBH Herman Wagner, Klavgweg 13, D-8391, Obernzell, Germany.

YS1AG-Andy-14222-SSB-0616-June. QSL to: Jose Andres Goens Marmol, 5 Calle Poniente, 929, San Salvador, El Salvdaor.

3B8GA-Faizal-14240-SSB-1200-June. QSL to: Faizal Baccus, 410 Modern Square, Vacoas, Mauritius.

6W6JX-Jean Louis-1422-SSB-0522-June. QSL to: Jean Louis Pippien, Box 200, Kaolack, Senegal.

KC6MR-14205-SSB-1126-June. QSL to: JJ1TZK Kazu Nakamura, Box 32 Ageo, Saitama - 362, Japan.

P29UV-Olaf-14201-SSB-0731-June. QSL to: LA5NM Mathias Bjerrang, Box 210, N-9401, Harstad, Norway.

VE8PM-(Zone 2)-Peter-14226-SSB-1158-June. QSL to: Peter U Wollenberg, 125 Albertus Ave, Toronto, Ontario M4R1J6 Canada.

RTTY News

Syd VK2SG provides some interesting contacts during the past weeks.

* V44KAE-14082 at 0610Z. QSL to: Box 298, St Kitts, West Indies.
* FG4FI-14088-at 2325Z. QSL to: Box 205 - 97139 Abymes, Guadeloupe.
* SU1DZ-14077-at 0400 Z. This station is 9K2DZ when he is at home. QSL to: Home address.
* A41KB 21080 at 1510 Z ARQ. QSL to: ON6BY.
* HI3UD 14089 at 0409 Z. QSL to: HI3AB.
* TJ1MR 14087 at 2357 Z. QSL to: F6FNU.
* 4S74M 21086 at 1718 Z. QSL to: Box 840, Colombo, Sri Lanka.
* SN0PJ 14086 at 0525 Z. QSL to: SP4KM.
* KG4DD 14086 at 2210 Z. QSL to: Don Donley, Box 692, FPO NY, 09583-0055 USA.
* V63BN 14089 at 1138 Z. QSL to: JG1NBD.

From Here and There and Everywhere

* Murphy again. Contrary to an earlier QSL information, V85EB Brian's QSL manager is not G0AWF. (June *AR*). Brian advised me that his QSL manager is still: VK2KFS, PO Box 62, Northbridge, NSW Australia 2063.
* Earlier we published some information about the "See Australia First" net on 21185kHz. There is now additional information from Ross VK6DA, who wants to correct any misunderstandings about his net. According to Ross, the "See Australia First" net operates on 21185kHz each Sunday morning, or 2300 UTC. However, there is an independent net on 21185 as

such, operating for about three years on that frequency each day at 0100 UTC, with a secondary session at 0400 UTC, and the net controller is Ross VK6DA. The frequency of 3.603MHz is monitored most evenings at 1100 UTC. Ross hopes that this information will clarify the position.

* Christine 3DA0BX advises that the Radio Society of Switzerland has been reconstructed, and we can expect a slightly increased activity from 3DA.
* Crozet Island is very active at the lower end of the CW portion of 14MHz. There is a new alternative QSL address: F6GVH, PO Box 35, Villemandeur, 45700 France.
* Andy UA3AB offers his help in obtaining cards from the operation of 1S0XV and 3W3RR or any of Romeo's cards. His address: Andrei Chesnokov, PO Box 967, Moscow, 125299 USSR.
* C31LJ is the new callsign of Peter, who used previously the callsign C31LHJ. QSL to: VE3SUN.
* 3D2JQ is Harry VK2CCW. QSL to: DL1RBH.
* VI4ILC was a special event station operated by Laurie, from 17 to 21 June in connection with the 74th International Lions Convention in Brisbane. QSL via: VK4WIN via the VK4 QSL Bureau.
* Bing VK2BCH returned from his Rotuma 3D2VX and Vanuatu YJ0AXV trip. QSL direct only to his home call.
* 9W6WPX was active during the WPX contest. QSL to: JA0VBJ.
* SN8JP was a special event station in Poland celebrating the visit of Pope John Paul II to that country. The operator was Tony. QSL to: SP8AJK.
* It wasn't so long ago that Dave K2PBB, who was operating as ZD8DX from Ascension Island, had a bad accident and had to be evacuated to the US for urgent medical treatment. Dave was replaced at his job by Jaques W4LZZ, who was also known as V29A, 5T5ZZ, 3X1Z etc. On arrival at Ascension, Jaques obtained the callsign ZD8XX. It is very sad to hear that Jaques has now become a silent key as a result of a heart attack.
* The cards of 3X1SG are still not acceptable to the DXCC, because Edmund has not yet sent the necessary documentation to that organisation for acceptance.
* According to John N5DRV, Dennis TJ1PD is coming back to the States with his log. QSLs to: N5DRV. In the meantime, a second operator will be active as TJ1PD. Dennis intends to return to Cameroon in two years' time.
* Heard on the band, a grand old lady, Helen W8GJX, who held an amateur licence and has been operating for the past 62 years.
* If you are one of those DXers who are constantly using the International Callbooks for correct QSL addresses, you need one important tool: a magnifying glass. Recently I found that I had to recheck some of the QSL addresses provided to me by my helpers, as it is very easy to misread the address one line above or one line below the wanted one. Please check and re-check the address before you send that QSL card to its destination, otherwise it might never reach the wanted QTH.
* The Malpelo Island Expedition cards, HK0TU, are now arriving in VK.
* Gray VK4OH, net controller on the Australian end of "The Family Hour" net on 14226, says that in the first six months of this year, 151 DX stations have checked into the net each day at 1100 UTC.

Festival of Whales

Finally, do not forget the special event station in Hervey Bay, Queensland VI4HBW, which will start operating on 3 August at 2300 UTC on 14180. The station will be active during the month of August celebrating the whale festival in that town. (See July *AR*). The humpback whale is one of the favourites of whale watchers along the coast of Hervey Bay, because of its graceful antics. The humpback frequently breaches or dives out of the water, slapping the surface with its great flippers. When beginning a deep dive, it brings its huge tail clear of the water in a graceful arc. The whale is black, with light grey undersides, and attains a length of 40 to 50 feet (12 to 16m). They migrate between polar waters in summer and their tropical breeding grounds in winter, and can be seen along the east coast of Australia.

The special event station will be active on the following frequencies: 3.790, 7.085, 14226, 21205, 28495 or as near as possible. Besides the QSL card specially designed for this occasion, there will also be an award for those who work the station. To obtain the award, send your QSL card and $5 to the Hervey Bay Amateur Radio Club, PO Box 829, Hervey Bay, Queensland, Australia 4655. QSLs can be sent via the Bureau, but if you want a quick response to your card, send with your SASE to above address.

QSLs Received

Note: W=week, M=months, Y=years, FM=from, Mgr=manager, OP=operator.

4U6ITU(3W FM OP DF4UW), ZL0ADN/ZL7 (5MO FM OP HA8XX), ZL0AAD/ZL7 (5MO FM MGR HA8XX), A25/KF7E (3W FM MGR K7UP), VU2JJQ (2W FM OP), FW/VK2BEX (6W FM OP), S21U (3W FM OP VK9NS), V31SW (4W FM OP), YJ8RN (3W FM OP), GJ4KBM (5W FM OP), 8P6AM (5W FM OP), FW/SM7PKK (1Y 4M FM OP), ZK1CT (3W FM OP), Y88POL (5W FM MGR Y32WN), YJ0AXV (2W FM OP VK2BCH).

Thank You

Thank you to all those who assisted me in compiling this column. Thank you for your information, photographs, letters, QSL informations, but special thank you to: VK2BCH, VK2BEX, VK2CKW, VK2DID, VK2QL, VK3DD, VK4DA, VK4OH, VK5TL, VK6DA, VK6RO, VK9NS, V85EB, VU2JJQ, 3DA0BX, and the following publications: QRZ DX, The DX Bulletin, DX News Sheet.

GOOD DX AND 73.
ar

CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CONTEST MANAGERS)

VK-ZL-O Contest

The starting and finishing times for both SSB and CW contests are 1000 hrs UTC not 0100 hrs as stated in the July issue.

1991 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 15 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 30MHz, except the 10, 18 and 24MHz bands;
- in any VK call area, including their own, P2 and ZL on bands above 52MHz, and as indicated in Rule 5.

Contest Period

0800 UTC Saturday 17 August to 0759 UTC Sunday 18 August 1991. 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 52MHz band.
(b) Very High Frequency (VHF) - for operation on bands from 52MHz 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 callsign) 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 52MHz 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 callsign. 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 callsign 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.
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 operator takes place, eg VK5XY/2 - this score will be added to the VK2 Division scores.

Entries - a log of all contest contacts must be kept. This should be in the format as shown in the example.

A summary sheet for each category and section entered must be submitted to the RD Contest Co-ordinator showing the following information in this order as per the example shown:

Category (HF or VHF). Section (phone, CW or receiving). Callsign, name, address, total score.

Declaration: "I hereby certify that I have operated in accordance with the rules and spirit of the contest."

Signed: Date:

Only the summary sheets for each category/section entered are to be submitted. DO NOT send contest logs.

Sheets are to be forwarded to the RD Contest Co-ordinator, 2 Moss Crt, Kingsley, WA 6026. Envelopes are to be endorsed "Remembrance Day Contest" on the front outside.

Entries MUST be forwarded in time to reach the RDCC by Friday 4 October 1991. Although they are not required by the RDCC, the contest logs should be retained by contestants in case proof of claimed score is desired by the contest co-ordinator.

Example Transmitting Log

Remembrance Day Contest 1991
Callsign: VK1XXX Category: HF
Section: (1) Transmitting phone

Date Time (UTC)	Band (MHz)	Mode	Call	No Snt	No Red	Pts
0800	14	SSB	VK2QQ	001	002	1
0802	14	SSB	VK6LL	002	001	1
0805	14	SSB	VK5ANW	003	011	1
0807	14	SSB	ZL2AGQ	004	003	1
0809	14	SSB	VK4XX	005	007	1

Example Front Sheet

Remembrance Day Contest 1991
Category: HF
Section: (a) Transmitting phone
Callsign: VK1XXX Name: Joe Brown
Address: PO Box 123, Farm Orchard, ACT 2611
TOTAL SCORE
Declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest.
Signed: J Brown Date: 20.8.91

Example Receiving Log

Remembrance Day Contest
Name/SWL No: L30371 Category: HF
Section: (c) Receiving phone

Data Time (UTC)	Band (MHz)	Mode	Stn Calling	Stn Called	No Snt	No Red	Pts
0800	14	SSB	VK1XXX	VK2QQ	001	002	1
0802	14	SSB	VK1XXX	VK6LL	002	001	1
0805	14	SSB	VK5ANW	VK1XXX	011	003	1
0807	14	SSB	ZL2AGQ	VK1XXX	003	004	1
0809	14	SSB	VK7AL	VK2PS	007	010	1

12. **Disqualification.** Any station observed during the contest as constantly departing from the generally accepted codes of operating ethics may be disqualified.
13. Awards - certificates will be issued in accordance with the Guidelines for Certificate Issue Remembrance Day Contest.

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 Licences per Division times the Weighting Factor.

The Weighting Factor is calculated such that should each WIA Division perform equally as well in 1991 as in the past four 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.

1990 VK-ZL-Oceania Contest

VK and ZL results have been published (*AR* March 1991, p39). Here are the results of the Overseas Section.

Congratulations to the high scorers. Their certificates are on the way.

The Contest Manager speaks ... I was again this year disappointed with the small number of ZLs entering a log. Per capita, more VKs seem to work in contests. Over the years, the rules have been changed to make it easier for all to enter, but obviously further input from contestants is needed to increase its appeal to ZLs. On the other hand, entries from overseas are well up, perhaps partly due to the activity of ZL150A, but there is a worldwide trend towards increased popularity of contest type activities. All logs received were of high standard, many prepared by, or logged straight off, a computer. There are many programs for this purpose, but most do not have the ability to correctly score the final result as required under the VK-ZL rules, and as the result of this, some contestants will find their scores adjusted.

Here are extracts from letters received from contestants ... I would like to let you know that despite my inexperience with CW contesting, I had a great time, and I'll have another go next year, VK3AOR. Enjoyed this contest as always, VK4LT. As General MacArthur said, "I will be back," VK5ZN. Lots of fun, VK3DZM. A most enjoyable contest, conditions seemed pretty good overall. Same set-up as in previous years, IC 751 to droopy dipoles, ZL2AGY. Enjoyed working the test as always, ZM1IM.

This year it is the WIA's turn to manage the contest, and I look forward to hearing lots of activity!

JOHN LITTEN ZL1AAS,
NZART VK-ZL-O CONTEST MANAGER.

Awards: Top scorer in each continent

	Phone	CW
Oceania	N7DF/NH2	YB3FEA
North America	W7TSQ	N6MU
South America	CP1FF	No entry
Europe	UT5DK	UZ1AWT
Africa	No entry	No entry
Asia	UA0TO	UZ0LWC

Top scorer in each country

Phone	CW
W7TSQ	N6MU
CP1FF	DK3KD
CT1BWW	EA5CLO
DL1KCW	G3WPF
EA7BA	HA3MQ
G5MY	HB9FR
HA3MQ	IK0ADY
HB9AAA	LA8WG
IK2LNF	OH3TY
IS0AEQ	OK2SG
LA1KQ	ON4XG
LZ1UO	SP3RBI
OH2PM	UZ1AWT
OK2KDS	UA2FU
ON8WN	UC2OL
OZ1ASP	RB5QF
PA0ZH	UI8AWX
SP3CDQ	UJ8JA
UZ1OWZ	UO5ODA
UT5DK	LY2BTA
UC1WWF	ES4MM
UD6DFF	UZ0LWC
LY2BR	JA1DAI
UA0TO	HL30AP
JA6YJS	

VHF-UHF Field Day

A log submitted by Maurie Batt VK3XEX was lost in the mail. However, he has sent another copy which has earned him second place overall, with 1283 points.

His scores were:

6 metres	225
2 metres	882
70cm	176

Congratulations, Maurie.

The photo shows Maurie's portable station in the field.

Ross Hull Contest 1991-92

A summary of the proposed rules for the next contest will be published next month. In the meantime, any comments on the proposals in April *AR* would be most welcome.

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VK3XEX Field Day and WICEN set-up.

CLUB CORNER

Amateur TV Goes Offshore

The South East Queensland ATV Group recently conducted a unique outside-broadcast between two islands in Moreton Bay, near Brisbane.

Bob VK4BOB and Brian VK4BDB set up a complete two-way vision and sound link at the lighthouse on Moreton Island, while Richard VK4XRL and Bob VK4ADN did likewise on Bribie Island. The exercise, which was carried out on Thursday 21 March, enabled primary school students to interact with teachers and students on each island.

The students normally get their education by correspondence, and this was their first experience of a classroom situation via television. A lesson on handwriting and a show-and-tell session were the highlights of the three-hour telecast.

To enable constant transmission in both directions, a 426.25MHz link was used from Bribie to Moreton, and a 1250MHz FM-TV link was used for the return path. The picture and sound quality of both links was perfect P-5s on the ATV rating scale. The distance between the two transmission sites was about 30 kilometres - mainly over water.

The operation attracted interest from at least one commercial television station, which sent a camera crew and reporter to cover the story, and there've been enquiries from other schools throughout Queensland about the exercise. The SEQATV Group would like to thank the Queensland Distance Education Department and the relevant authorities for allowing the transmission from the lighthouse area.

Peter Jones VK4YAC ar

DIVISIONAL NOTES

FORWARD BIAS

PHIL CLARK VK1PC

Technical Symposium

The very popular technical symposium conducted by the Canberra Amateur Packet Radio Group will be held again this year on Saturday 31 August.

The agenda has not been finalised at this time but, to whet your appetite, some of the likely subjects will be:

Repeaters of the future (combining voice and data)

High speed modems

Antenna modelling on PCs

Getting started in packet

Getting your stations on the air (HF, VHF, UHF-SSB, CW, FM)

Satellites aloft etc, etc.

The day will be jam-packed with topics from many aspects of our hobby. The symposium will be held in University House at the Australian National University and will start at 9.00am and finish around 5.00pm.

Refreshments, catered lunch and all seminar papers are included in the low $16 registration fee. Registration in advance is required in order to provide for the catering, so be early to secure your place. Registrations will close on 2 August.

Contact Gavan Berger VK1EB on phone (06) 258 5390 for further information.

Registration may be made by forwarding your name, address, callsign and $16 fee to:

CAPRG
c/o Gavan Berger
PO Box 68
Charnwood ACT 2617.

Please note that cheques should be made payable to CAPRG, and that the closing date for registration is 2/8/91. All amateurs are welcome to attend, so come along!

Demonstration Station

George VK1GB and his band of hardy helpers have been doing a great job of promoting the hobby of amateur radio in the "deep" north, with the demonstration station at the Hall markets on the first Sunday of each month. Volunteers are still needed to help man (person?) the station and to explain the equipment and hobby to anyone interested.

There has been considerable interest at the station and it has already attracted new members to the Division.

If you can help out with this station, please contact George VK1GB QTHR or via two metres.

You do not need to spend much time and you don't have to come every month, but the more we have, the less each has to do.

So, what about it? Will YOU come along and help promote amateur radio to the community? George would certainly be pleased to hear from all those who could help out.

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VK2 NOTES

TIM MILLS VK2ZTM

VK2WI Adds 20-Metre Relay: In the last notes it was indicated that the Division was expanding its HF broadcast coverage. Fifteen metres had already been added a few weeks ago and, during July, 20 metres was introduced. This will be done on behalf of VK2WI by Peter VK2OG using a frequency of 14.160MHz. This may change at a later date higher up the band; it depends upon coverage. The relay will only be on the morning broadcast, which starts at 0045 UT. With this relay there is coverage from 160m through to 23cm except for 17 and 12m; if anyone can assist, please contact the Divisional Office.

VK2WI is located at Dural in the north-western section of Sydney, and is one of the highest locations in the metropolitan area. For some years, commercial systems had been located at the site on a limited basis. It is now proposed to increase the commercial use of the site, and negotiations are currently underway. The financial return from this venture will fund the operation of VK2WI and associated facilities.

80th Anniversary Dinner: A most enjoyable evening was had by the 60 members and guests who attended Darling Harbour on 28 June.

Divisional Examinations: There is a change of date for the forthcoming August exams. They will now be held on Sunday afternoon, 18 August. Closing date is end of July. Expanded details in the broadcasts.

RD Contest: For the RD weekend there will be a broadcast from VK2WI starting at 5.15pm on Saturday 17 August, using the morning frequencies. There may be a repeat at the usual time Sunday morning, without callbacks. The evening broadcast will be as usual from 7.15pm.

Grab Bags: A limited number of bags of assorted components has recently been assembled, limit two. A bag is just under a kilo in weight, and will set you back $3. Collect from the office. If you would like them by mail, then you can get two bags plus pack and post for $10. You might as well have the two bags for the postage is the same for one or two bags. By now the ballot for the 2m hand-helds has been conducted. When these notes were being completed there was still a surplus over demand, so listen to the broadcasts to see if any remain.

Divisional Software Library: This commenced last month; the first item was a Morse Code program. Send a self-addressed 9x4 envelope to PO Box 1066, Parramatta NSW 2124 for details and operating conditions.

Spread Spectrum Group: There is interest to form a group for this mode. If you have an interest, contact the Divisional Office or Dave VK2KFU.

WICEN (NSW) Inc: This month is the annual City to Surf exercise on Sunday 11th. Co-ordinator is Brett VK2XMU. The Batemans Bay car rally is on 7 September. AGM at Parramatta 24 August.

Happenings: The Sydney Radio Group advises that it will not be holding its field day this year and has shifted planning to next year ... A recently formed club in Sydney is the Australian Amateur Television Club. Details from Colin VK2JCM (02) 759 8151 ... Next St George ARS auction, 14 September ... Next Divisional Trash and Treasure, 29 September.

New Members

A warm welcome is extended to the following who recently joined the VK2 Division.

S	DeFrancesco	VK2XDF	Croydon Park
G	Hancock	VK2GCH	Wauchope
K H	Harrer	Assoc	Arncliffe
H M	Martin	VK2MKB	Lyndhurst
W	Memphis	Assoc	Quirindi
A	Mollenhaver	Assoc	Wentworth Falls
L D	Smith	Assoc	Hornsby
R	Soulie	VK2ARS	Fairfield
J H	Walker	Assoc	North Parramatta

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5/8 WAVE

JENNIFER WARRINGTON VK5ANW
& ROWLAND BRUCE VK5OU

Examinations

Here is an update on the information given in this column in April. Examinations will be given at the following times and dates:

31 Aug	1pm	WIA SA Div
21 Sept	10am	Christine Taylor
26 Oct	1pm	WIA SA Div
23 Nov	10am	Christine Taylor
7 Dec	1pm	AHARS

For further information, please contact the following:

WIA SA Div
Don McDonald VK5ADD
WIA (SA Div) Examinations Officer
Ph: 276 1251 (H)
AHARS
Adelaide Hills Amateur Radio Society
Alan Haines VK5ZD (Secretary)
Ph: 276 7091 (H)
Christine Taylor VK5CTY
16 Fairmont Ave, Blackforest 5035
Ph: 293 5615 (H)

Nomination for examinations closes one week before exam dates. My thanks to Peter Koen for the above information.

Excellent Speaker Missed

The late substitution of our June speaker meant that there was little time to publicise him or his subject, which was a great shame because it meant that only a small number heard Bob Major from the Department of Mines speaking on Chernobyl and its nuclear disaster, and on the safe storage of nuclear waste. He also put a convincing argument for the use of nuclear energy over, coal etc. Bob is well versed on many subjects. I recently heard him speak on the Mt St Helens volcano and the San Francisco earthquake disasters. I hope that we will get a chance to hear him again.

In the meantime ... DON'T FORGET that Tuesday 24 September is our Display of Members' Equipment night. This is the one night in the year when members can bring along their home-built equipment, tell us a bit about it, and stand a chance of winning money or vouchers as prizes.

Although I have not had confirmation of their participation this year (and I hope I'm not putting anyone in an embarrassing position) we are usually indebted to John Moffatt VK5MG of International Communication Systems, Port Adelaide, and to Merv Millar VK5MX who presents the Millar Award and Prize for the best "newcomer" - so, get that pet project finished and bring it along to next month's meeting.

Diary Dates

27 Aug General meeting (speaker not known)
24 Sept Display of members' equipment

JENNIFER WARRINGTON VK5ANW

Jenny VK5ANM is overseas at present, so you have a few lines from me as a "guest editor".

I must say, being a council member certainly gives you a chance to try your hand at quite a wide range of jobs. I have been the QSL Bureau manager (a regular position, now taken over by Alan VK5ZN) broadcast officer (relieving), *AR* contributor (relieving, I hope), education officer, federal councillor, co-ordinator of what seems to have been a fair number of events, but in practice probably only a handful, speaker to other organisations, visitor to affiliated clubs, chairman of meetings, broadcaster, writer of letters to papers, answerer of innumerable phone calls from members, prospective member, ex-members ("let me tell you why I resigned"), journalists ("what are you hearing from the Middle East? How often have you spoken to Rajiv Ghandi?") and, on a couple of occasions even, the month's attraction at the WIA meeting. In most of these, I have been very ably assisted by others who gave me wonderful support. Yet, despite the long list, there are man others who, year in year out, do jobs for the WIA which are far more onerous, far more time consuming, far less rewarding - no, that's wrong, "much lower profile" is a better phrase - than these.

I changed the wording because it would be fair to say that, despite the occasional whinger, despite the frustration from time to time, I have found the jobs rewarding; I've learned a lot of things I wouldn't have known, I've made a lot of friends who otherwise would have been only acquaintances, if that and, indeed, I have achieved a certain satisfaction in being able, in some small measure, to put something back into this hobby of ours. So, and there has to be a "so", after all that, if you have ever considered standing for a position in the WIA, or any other organisation for that matter, and have rejected the idea, don't be afraid of the work involved, don't worry about the late hours of committee meetings, and the fact that your XYL/OM will consider you a total stranger and the kids will think you to be only a lodger, go for it; it's well worthwhile. Mind you, when all this is over next year, I'm going to put up my tower, dust off the rigs and get back on-air again to prove to all those DX friends that I am in fact not a silent key, but alive and well in one of the best places on earth. - This "editor's" decision is final, and no correspondence will be entered into.

One of those almost unsung heroes, Peter VK5PRM, BGB supervisor, auctioneer extraordinaire (the spell checker didn't like that) is also the program organiser. Despite the difficulties in coming up with a speaker or some other event each month, it looks as though he has got a bit ahead of himself, and arranged things quite a way in advance. Look out for details on the Sunday broadcast.

When you receive this edition of *AR* the involvement of the WIA in the Hobbies Fair and Exhibition at the Wayville Showgrounds will have just taken place. I hope you found time to visit it. Once again, much, nearly all, of the work has been taken out of my hands. It needed to be; I seem to be spending more and more time away from Adelaide on work-related matters. At the time of writing, details have yet to be finalised, but my thanks to all who helped make it the success I am sure it is going to be. Finally this month, although I guess it is a paragraph I could insert each edition, welcome to our new members, and congratulations to all those who have successfully taken their examinations, or upgraded. I must say the devolution of exams was a great step in making it easier to find time to sit them, and it is good to see so many potential amateurs and therefore WIA members, making use of the more flexible arrangements. **Rowland Bruce VK5OU** ar

QRM FROM VK7

FRANK MOORE VK7ZMF

The Northern Branch of the VK7 Division has seen a lot of increased activity in the past few months, thanks mostly to the instigation of Barry Hill VK7BE. Barry is the recently elected Northern Branch president.

Barry and his Executive have put to air a broadcast called *The Amateur Hour*. This is a weekly broadcast on Wednesdays 19.30 hrs local on the Launceston 2m repeater VK7RAD, with relays on VK7REC, and sound on ATV RPTR VK7 on the north-west coast.

Other activities in the northern branch are the start of lessons for the NAOCP course, which started 14 July.

Also, it produces a monthly magazine called *The Network*, which contains local news and happenings, with a section for classified ads. This is available at electronics outlets in Launceston, and from the Northern Branch at Box 275, Launceston.

Andrew VK7ZHA is conducting experiments with propagation across Bass Strait on the VHF and UHF bands. He has a group of regular contacts in VK3 on 2m and, when conditions are right, 70cm. Listen for Andrew on 144.100, 0820 local every morning.

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EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

Firstly, thank you very much to those of you who have sent in comments or suggestions about the present examinations system. Input has been received from several individuals and groups, with a number of topics being raised. The general feeling from this sample is that there is significant dissatisfaction with the system, with a number of possible ways of streamlining worth considering. The WIA is negotiating with DoTC in the hope of overcoming some of the problems.

However, I have not so far received any copies of past examination papers from readers. I think it is time that some comparisons were made to see how even the standard has become. I realise that any one examining body will have tried to keep the standard of its own papers even, but there is scope for a lot of variation between groups, and I would like to have a few impartial opinions on the degree of variation.

Ever since the question banks were released a number of us have been concerned that they are too small and too unbalanced. I am now starting to make a collection of questions, both theory and regulations, for possible addition to the banks. I intend to circulate the collection for comment to a number of volunteers who are active in either classes or examinations. Consequently, I would be very happy to receive copies of questions which have been

written by readers.

However, I am being a bit pushy, and asking that if you have some to send or intend to write some specially, you check with the syllabus and the existing banks so that the new set complements the old rather than duplicating it. For instance, there is no need for more questions on capacitors in parallel. It would also be helpful if the new questions were tagged with the syllabus section and subsection so that they can be slotted in to the banks easily.

I seem to spend a lot of these notes asking for people to do things or contribute something. (I do not think I have ever asked for money, have I?). One of the satisfying features of this position has been that so many readers have taken the time to make comments or suggestions, so that there has been feedback on most of the topics raised.

So, for my last item this month, another request. The current novice and AOCP/LAOCP theory syllabuses were last revised in 1984. There was a slight amendment after the extension of the novice privileges to include some of the 2m band, but ,to my thinking, they are starting to become outdated. Some time within the next year I would like to start on another revision, and here again is an opportunity for the readers, the class teachers, examiners and other concerned amateurs to have some input to the review. The trouble is that technology has developed so much over the past seven years that it is hard to decide how far to extend the syllabus without making it much too extensive. The alternative is to delete some existing sections, but which are so dated that they are no longer applicable?

Please note, I am NOT suggesting altering licence structure or dropping the CW examinations, I just want input on the theory syllabuses. I look forward to receiving your comments and ideas.

73, Brenda VK5KT
WIA Federal Education Co-ordinator
ar

WARC-92 UPDATE

David Wardlaw VK3ADW
WIA WARC Coordinator

Proposals to go to Warc-92 are now Appearing

A number of countries, including Australia, have published their preliminary positions for WARC-92.

The CEPT (European Conference of Administrations of Posts and Telecommunications) which has 31 members, has produced its provisional views.

And CITEL (Inter-American Telecommunications Conference) has published the report of the CITEL 1992 World Administrative Radio Conference Interim Working Group.

I am now in a position to let you know the provisional proposals of Australia for WARC-92 in regard to the Amateur Service.

Australia supports a realignment of HF broadcasting allocations on a worldwide basis in relation to harmonising the amateur allocations near 7MHz, provided that there is no net loss of broadcasting spectrum.

There are no proposals for intrusions into any other amateur bands from Australia.

The situation in regard to Wind Profiler Radars is of concern to amateurs, as the optimum frequencies being quoted are around 50MHz and 400MHz, as well as 1000MHz.

As there is a problem at 406MHz with interference to Search and Rescue satellites from Wind Profiler Radars, alternative frequencies between 440 and 450MHz have been mentioned.

WARC-92, due to the limitations of its agenda, will not be in a position to make an allocation to Wind Profilers.

Australia has said there is a need for CCIR and WMO to conduct urgent studies, and for a later WARC to examine the matter of suitable bands for the operation of wind profile radar.

HF Broadcasting

The USA has proposed the worldwide harmonisation of amateur and broadcasting in the allocated spectrum.

HF spectrum is essential for services other than broadcasting.

Regions 1, 2 and 3.

6900-7000kHz	Fixed Amateur Change in all regions Amateur satellite Land mobile (secondary service)
7000-7200kHz	Amateur Amateur satellite
7200-7300kHz	Broadcasting Change in region 2 Amateur

New Zealand says no intrusions into amateur, amateur satellite allocations.

CEPT Position

In respect of the 7MHz situation, the administrations submitting these proposals offer the following rearrangements of the existing amateur, amateur satellite and HFBC allocations with a view towards eliminating the present regional differences and thus standardising the allocations to these services on a worldwide basis.

Regions 1, 2 and 3

6900-7000kHz	Fixed Amateur Change in all regions Amateur satellite Land mobile (secondary service)
7000-7100kHz	Amateur Amateur satellite
7100-7300kHz	Broadcasting Change in region 2 Amateur

CITEL Position

There should be no intrusions into or reduction of the amateur or amateur satellite service from 3.5MHz to 10MHz.

The broadcasting requirements have greatly exceeded the number of available channels in

VHF and Up

The original USA proposal that 420-421MHz be allocated to the Mobile Satellite Service, which could have affected the Amateur Service in Australia, has been withdrawn.

The USA has also made proposals concerning the 2300-2450MHz band which, if accepted, may cause further restriction in access to the band by the Amateur Service, and especially the Amateur Satellite Service.

The USA has a proposed recommendation *relating to interim implementation of wind profiler radars at frequencies near 400*MHz. For WARC-92 to put forward. This could easily affect the 420-450MHz amateur band, as the frequencies have been left for the conference to insert.

ar

ALARA

JENNY ADAMS VK3MDR
70 KANGAROO GROUND RD WATTLE GLEN 3096

Each year my husband and I listen to the Sydney to Hobart and Melbourne to Devonport yacht races on the HF box, hearing ahead of the general population of incidents occurring, especially at night. Sometimes not getting much sleep with the hiss and crackle. It was with great delight I received a letter from Joan Beevers VK3BJB catching up on her activities with yachts, yacht races and JA m/m nets.

In the Melbourne to Osaka double-handed yacht race, Joan was kept busy helping the two all-female crews. Beth Higgs and Sumiyo Kaneko on the Yacht *Marina City Club* when it had rudder trouble in the Coral Sea. Joan relayed messages between them and the vessel's owner, and other contestants with helpful advice. Beth and Sumiyo finally made it to Osaka okay; after their rudder trouble, they had very rough weather due to tropical cyclone *Lisa* around the Solomon Islands/equator area, and also very strong winds around Guam, with torn sails etc as a result of typhoon No 4. Joan is sure they were glad to finally set foot on firm land after months on board the yacht. The irony of it was that when they were within 50 miles of Osaka they were becalmed and had to wait for winds to get them over the finish line at Osaka!!!

The marine radio of the other all-female crew on the yacht *Raika* gave up working, so they were not able to check into the official Penta Comstat race roll schedule every afternoon. Also, they had no idea where the rest of the Melbourne to Osaka yacht fleet were, so Joan kept a schedule with the girls every night at 7.30pm EST to relay the latest Argos positions of the leading 20 yachts, plus all the yachts in their class, Racing Division Class C when they checked into the afternoon roll call schedule on the marine band. The girls had only amateur radio for contacts to Japan; every fourth day, when it was the compulsory day for the Class C to check in, Joan would send *Raika's* position from the afternoon Japanese yacht net to Penta Comstat by fax. This daily schedule was kept up for three weeks until they arrived in Osaka.

Joan was able to go on board this year's winner of the Melbourne/Osaka double-handed yacht race (it won the 1987 inaugural Melbourne/Osaka yacht race.

When she and her family went to Victoria Dock, Melbourne to meet all the Japanese entrants they met the Japanese skipper, Mr Sugair (TJIMBY/mm) and crew member Ross Field, who was on the winning New Zealand yacht *Steinlager 2* in the last Whitbread Around the World yacht race. "Great to be able to mix with all these "famous" yacht people," says Joan.

CHEERS TILL NEXT TIME
ar

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. All of the items given below are available in the Executive Office Library. As a special service to **Members Only**, a photocopy of any complete article is available for $2.50 posted. To circumvent any copyright problems, please be sure to state - 'The information is required for the purpose of private study'. Address your request to 'The Librarian, Executive Office WIA, PO Box 300, Caulfield South Vic, 3162.'

To make life easier for our hard-working librarian, Ron Fisher VK3OM, please quote title, periodical, month and page number. eg The Logic analyser, EA, May pp 126 - 128.

Amplifiers

Linear RF

Ameriton's AL-811 Linear Amplifier. Bill Clarke WA4BLC, *73* issue #367 April 1991 pp 38, 40. il photos. A product review of a 600W PEP amplifier which uses 3 811As in grounded grid. Pi networks provide input and output matching. The reviewer points out the cost effectiveness of this product - priced at US$649, it provides a power output less than one S point down on amplifiers costing an extra $1000.

Command Technologies Commander HF-2500 Linear Amplifier. Mark J Wilson AA2Z, QST vol LXXV No 5 May 1991 pp 41 - 44. il graphs and photo. A Product review of this equipment including measured results.

The Commander II Amplifier. Jeffrey J Covelli WA8SAJ, 73 issue #365 Feb 1991 pp 54 - 55. il photos. A product review of a 2m linear amplifier with an output up to 1kW on SSB. A single 3XC-800A7 tube is used.

Small Signal

The Basic Transistor Amplifier. Peter Phillips, *EA* vol 52 No 5 May 1991 pp 100 - 103. il ccts. An educational dissertation containing information necessary to design voltage amplifiers.

Antennas

Microwave

A High-Performance UHF and Microwave System Primer. Dave Mascaro WA3JUF, *QST* vol LXXV No 5 May 1991 pp 30 - 33. il diags. The use of separate antennas is proposed for transmission and reception. A greater ERP together with better signal to noise on reception and lower cost is claimed for this system. If a dish is used, a waveguide feeder design is offered, which separates transmitted and received signals.

The Super Rover. Richard Comly N3AOG, *QST* vol LXXV No 5 May 1991 pp 26 - 27. A description of an eight-foot parabolic rotatable antenna mounted in a pickup truck. The assembly is dismantled for transportation.

Miscellaneous

Apartment Antennas: A Challenge. Stan Gibilisco W1GV, *73* issue #368 May 1991 pp 42, 44 - 45. il diags. A general discussion is given of the difficulties faced by the apartment dweller; numerous suggestions are offered to solve these problems.

Artificial RF Ground. J Frank Brumbaugh KB4ZGC, *73* issue #367 April 1991 pp 10, 12. il cct. A series resonant circuit, tuneable on all bands from 40 to 10m, which holds the transceiver chassis at zero RF potential. An 8 foot counterpoise is required; if extended somewhat, 80m can also be handled. A current transformer provides a resonance tuning indication.

Ten for 10. Michael Harris KM4UL, *73* issue #367 April 1991 pp 52, 54, 56. il diags, graph and photos. A low-cost X-beam antenna for 10m, which should cost less than US$10 to build. Tails are provided at 45° to each element; it is claimed that these reduce the incidence of minor lobes. A forward gain of 6dBd is quoted, together with a front-to-back ratio of 15 - 18 dB.

The ESV Mod Quad. Martin Beck WB0ESV, *73* issue #367 April 1991 pp 14 - 15. il diags. A design for four element quads using Acrylite plastic; construction details are given for different antennas covering a frequency range of 50 to 1296 MHz. Modifications for delta loops are also given. A gain of 10 dBi is claimed.

10 dB om 10 Meters - for Nothing (2). William Skidmore VE3AUI, *QSTVE* June 1991 pp 3 - 4. il diags. A description of a five over five Sterba array, which gives 10 dB gain. Directivity is 55° between half-power points, concentrated at low vertical angles. The antenna may be fed with open-wire line and an ATU, or via a bazooka balun and coax. This latter arrangement can be improved by a quarter wave stub, also described in the article.

Multiband

Pocket-Portable Seven-Band Antenna. J Frank Brumbaugh KB4ZGC, *73* issue #367 April 1991 pp 46 - 47. il diags. This antenna uses 7-wire flat ribbon; each of the wires is cut

for the appropriate length to cover 40 to 10m operation. The flat ribbon gives a compact, tangle free transport package. It is suitable for use as an indoor antenna, or for portable field use.

The Carolina Windom 160. (Product Review) Bill Clarke WA4BLC, *73* issue #367 April 1991 pp 34, 36. il diags, graphs and photo. This off-centre fed antenna is manufactured by The Radio Works, and can be operated with a tuner over the complete HF range. Polar plots are presented in the article.

Product Reviews

The Happy HalfSquare. Jim Gray W1XU, *73* issue #367 April 1991 pp 22 - 23. il diags and photo. A review of the AntennasWest HalfSquare antenna. It consists of a horizontal dipole with quarter wave vertical tails. The input resistance at either corner is 50Ω. A gain of 4dBd is claimed. Good low-angle propagation is reported.

VHF/UHF

Collinear for Two Meters. F W Lee G3YCC, *73* issue #367 April 1991 p 24. il diag and photo. A low-cost two element vertical antenna, which uses a quarter wave matching stub for connection to either a 50Ω or 75Ω coaxial cable.

Yagi

Mosley TA-34-M Triband Yagi Antenna. (Product Review) James W (Bus) Healy NJ2L, *QST* Vol LXXV No 5 May 1991 pp 43 - 44. An evaluation of this antenna is given, with measurements.

SV Products' WARC Band Yagi. (Product review) Drayton Cooper N4LBJ, *73* issue #367 April 1991 pp 42, 44. il diags, graphs and photos. A review of a two element duo-band trapped Yagi for 17 and 12m. The traps are of coaxial design.

ATV

FM-ATV

Future Modulation Amateur Television. Don C Miller W9NTP, *73* issue #365 Feb 1991 pp 32 - 33. il cct and photos. This article discusses the benefits of video transmission using FM instead of AM. It is claimed that a 20 to 30 dB improvement is obtained. A circuit is given for a 23cm FM-ATV modulator.

Audio

Quad 'DI' Box For Stage And Studio. (DI = Direct Injection) Rob Evans, *EA* vol 53 No 6 June 1991 pp 64 - 69. il cct, cmp, pcb and photos. This device provides buffered single or balanced complementary outputs, from signals derived from various musical instruments. The balanced output has a 20dB attenuation option, but otherwise the amplifier is unity gain. The design allows for four such units to be housed in a single cabinet; it is powered by 240V AC.

Computers

Software for the Ham Shack, Part I. Bill Clarke WA4BLC, *73* issue #368 May 1991 pp 22, 24. The initial article in a series of programs written in GW BASIC for IBMs and clones, which provide ham system calculations. Part I handles antenna and transmission line calculations.

Electronic Devices

The Copperhead Keyer Paddle. Charles D Rakes KI5AZ, *73* issue #368 May 1991 pp 9 - 10. il cct, cmp, diags, pcb and photos. A non-mechanical paddle, which uses touch-sensitive copper strips to actuate dits and dahs. The wrist and hand rest on a copper plate, to provide an earth connection. Two output transistors, each driven by a 4093 Schmitt trigger, can energize a conventional keying circuit.

The Mini Keyer. Klaus Spies WB9YBM, *73* issue #368 May 1991 pp 14, 18. il cct, cmp, pcb and photo. An electronic keyer which is based on a 555 timer and a dual 74HC73 JK flip-flop. The circuit is presented without a functional description; performance specifications are not stated.

The SR3 Simplex Repeater from Brainstorm Engineering. (Product Review) Dick Goodman WA3USG, *73* issue #368 May 1991 pp 46 - 47. il photos. A description of a store and forward simplex repeater controller. Message is retransmitted from memory store on cessation of carrier input. Various accessory functions may be controlled by DTMF tones.

Filters

Audio Notch

The J.Com MagicNotch Audio Filter. (Product Review) David Cassidy N1GPH, *73* issue #368 May 1991 p 40. il photo. A switched capacitor scanning device, which detects and notches out continuous tones. It will track frequency variation of an interfering signal.

Crystal

Simple Crystal Filters. Bill Parrot W6VEH, *QEX* No 111 May 1991 pp 10 - 14. il cct and graph. The article considers the application of low-cost computer crystals to half-lattice filter design for SSB or CW use. A simplified approach is described to achieving the best possible results without the purchase of more expensive crystals.

Transceiver

The JPS NIR-10. (Product Review) Peter Ferrand WB2QLL, *73* issue #368 May 1991 pp 34, 36. il graphs and photo. This device uses digital processing methods to recognise speech, and to produce an output which discriminates against noise. It is inserted between the receiver and speaker. A switchable bandpass option gives a sharp sided bandpass filter at pass bands of 200, 600 and 1500 Hz.

Power Supplies

Miscellaneous

Power Supply To Replace Plug Packs. Jim Lawler, *EA* vol 53 No 6 June 1991 pp 80 - 81. il cct, pcb and photos. This circuit is designed around an Arlec 7VA transformer with two independent 12V windings. Provision is made for positive and negatve regulated outputs; alternatively, each winding may be combined in series or parallel.

Series Regulated

The Series Regulator Power Supply:A Closer Look. William E Sabin W0IYH, *QEX* No 111 May 1991 pp 3 - 9. il ccts, cmp, graphs and photos. The article includes a general theoretical discussion on the design of series regulators. A specific design is offered for a laboratory power supply, using the LM723 regulator chip, and two 2N3055 output transistors. Its specifications are: continuously variable output voltage from 4.5 to 25V, continuous duty load current of 2.5A, load regulation better than 0.03% to 2A and 0.1% to 2.5A, line regulation 0.01% for 5% AC line change, AC ripple less than 2μV RMS, less than 2μV RMS random noise to 500kHz, rapid response to line and load changes, and a low output impedance. Bend over (foldback) current limiting is included.

Receivers

Simple SupeRX. Bruce O Williams WA6IVC, *73* issue #367 April 1991 pp 26, 28, 31. il cct, cmp, pcb and photo. A simple 4 IC receiver, which is operated by a tuning knob and a volume control. It receives CW and SSB, and can be built to function on either 80, 40 or 30m.

Technology

Basic Steps Towards Eliminating Telephone RFI. Pete Krieger WA8KZH, *QST* vol LXXV No 5 May 1991 pp 22 - 25. il diags and photo. A general discussion which outlines the basic steps to be undertaken to eliminate RFI problems from the telephone system. A filter choke design is offered to reduce common mode induced RF currents in telephone wiring.

Connectors for (Almost) All Occasions - Part 2. David Newkirk WJ1Z, *QST* vol LXXV No 5 May 1991 pp 34 - 39. il diags and photos. Concluding part of article, which gives wiring details for shielded phono, DIN, mike and RF plugs.

ESD - Electrostatic Discharge - Part 2. Brian P Bergeron NU1N, *QST* Vol LXXV No 5 May 1991 pp 28 -29. il diag photos. A further discussion on ESD, which expands on detail for precautions which may be taken to prevent damage to sensitive components.

Test Equipment

Bridges

The Handy Inductance Bridge. J Frank Brumbaugh KB4ZGC, *73* issue #368 May 1991 pp 11 - 12, 18. il cct, cmp, pcb and photos. This device is capable of measuring inductance values for 1 to 30μH. A 5MHz crystal oscillator ensures bridge stability. The measurement range may be altered by different choice of crystal frequency or tuning capacitor.

Using a Noise Bridge To Measure Co-

axial-cable Impedance. Jack Althouse K6NY, *QST* (Technical Correspondence) vol LXXV No 5 May 1991 p 45. il diag. A technique is described to use a noise bridge to measure the characteristic impedance of coaxial cable.

CROs

New CRO Adaptor for Monitors - 2. Peter Phillips, *EA* vol 52 No 5 May 1991 pp 74 - 80. il ccts, cmp, diags, pcb and photos. Construction details are given for input amplifier and graticule generator.

New CRO Adaptor for Monitors - 3. Peter Phillips, *EA* vol 52 No 6 June 1991 pp 72 - 78. il ccts, cmp, diag, pcb and photos. Concluding part provides details of A to D conversion and storage circuits. The complete construction and adjustment is discussed in detail.

Miscellaneous

A Better Tube Tester. John Shelley WA1IAO, *73* issue #368 May 1991 pp 30, 32. il cct, diag and photo. Device tests for interelectrode shorts by means of manual switching between base pins. 7 and 9 pin bases are catered for on a plug-in basis; others may be tested by flying leads.

Transceivers

Miscellaneous

A Digital Frequency Display for the Modular Transceiver. Mike Grierson G3TSO, *RadCom* vol 64 No 4 April 1991 pp 49 - 51, 54. il ccts, cmp, graphs and pcb. A design for a four digit frequency display, with a resolution of 100 Hz. The ability of the Intersil 7217 IC to be offset programmed is exploited so that the display only requires local oscillator input to present operating frequency.

Covert Hamming. Eldon Ryan K6BRP, *73* issue #368 May 1991 pp 20, 85. il ccts and photos. A design for a miniature microphone and PTT switch, which enables a hand held to be used in a clandestine manner. The microphone may be concealed in a pen housing, or within a phone jack plug.

Product Reviews

Kenwood TS-790A VHF/UHF Transceiver. James W (Russ) Healy NJ2L, *QST* vol LXXV No 4 April 1991 pp 39 - 43. il photos. A comprehensive review, with measurements and spectral responses for this transceiver.

Transmitters

QRP

Two QRP Transmitters. Charles D Rakes KI5AZ, *73* issue #368 May 1991 pp 26, 28 - 29. il ccts, cmps, pcbs and photos. (1) 'Color Burst Ether Duster' (so named from the use of a 3.579 MHz colo(u)r burst crystal) is designed to produce 1W output via four 2N3904 transistors in parallel.

Two 7400 quad gates supply oscillation and drive for the transistors. (2) The '40m Wave Bender' gives 500 - 750 mW output from a pair of 2N3904 transistors. driven and controlled by a single 7400 quad gate.

Glossary of Abbreviations

il	The article contains illustrations, a list of which follows.
cct	A circuit diagram
cmp	A component layout drawing
EA	*Electronics Australia*
diag	A mechanical drawing
pcb	A master drawing from which printed circuits may be produced
QSTVE	*QST Canada*
RadCom	*Radio Communication*
73	*73 Amateur Radio Today*

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OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Slow Sleuths

Regarding recent letters to *AR* about unlicensed operators and pirates, I had an instance in January 1991 where a pirate was heard operating on 28.485MHz using a callsign which is allocated to a VK5 club station.

After gathering, with the assistance of a full-call operator, as much information as possible, letters were written to the WIA SA Division, DoTC and the club station concerned.

I received a verbal thank-you from the WIA SA Division, but the club station and DoTC did not even bother to acknowledge my letters. If DoTC cannot be bothered to acknowledge correspondence in regard to unlicensed operators or pirates, I ask you, what hope do we have?

I suppose if we lose the 10m band that will be one band less for DoTC to worry about, that is if it worries about the bands in the first place.

BILL VOGEL VK5NVW
16 WANDILLA ST
LARGS NORTH 5016

Plug Availability etc

Re the common three-pin plug that is used on all household domestic appliances, and possibly misused elsewhere. A while back I saw a motor vehicle parked in front of the local hospital with a short length of three-core flex and a three-pin plug hanging out from under the engine bonnet.

Now, to get to my point. Just where can one get plugs and sockets like the old Jones plugs and sockets along with other types that can be used safely where there is a bit of current or voltage or both? It seems that all one can get today are "D" connectors, microphone connectors and printed-circuit-board plugs and connectors. In regard to the use of the 10m band (amateur) by non-amateurs (Over To YOU, June 1991) maybe we have here a case for dropping the CW requirement for all frequencies higher than 25MHz.

This would allow those with limited licences to use this band and perhaps encourage these people to upgrade their licences because of the creation of an interest in the high frequency bands.

A case of populate or perish.

GRAHAM J MUIRHEAD VK4WEM/4WIW
23 CUNNINGHAM ST
WARWICK 4370

Amateur and CB Combined?

I have been reading and hearing of the concerns of amateurs regarding potential loss of 28MHz. I have also heard suggestions of no-code amateur licences being introduced overseas. It seems that there is a trend for amateur radio options to expand to fill the gap after CB. I have often thought that it is silly that I must have TWO receivers if I wish to listen to 28MHz sometimes, and talk with the CBers other times. I like the use of CB when on the road, and it is the only legal way I can transmit below 30MHz, having only a limited amateur licence as well as CB.

If DoTC allowed amateurs to transmit on 27MHz, provided they kept to AM/SSB and around four watts, then they could retain and maintain ONE rig. They could encourage the progress, on-air, of those serious technically minded parties who are restricted to CB. Provided amateurs using CB didn't abuse the options (eg, by holding Morse QSOs) I believe this could do more good than harm.

IAN GRIFFITH VK3XNV
PO Box 323
ROSANNA 3084

Displays, Museums, Collections

From time to time one reads of a certain display, museum or collection featuring amateur radio or related equipment. Possibly most are the work of various organisations or groups, but it is obvious from advertisements that a number of individuals have collections or are restoring old equipment.

I have not seen this information in a correlated form, and think that such a list would be in the interest of all concerned. The list could include such information as type and size of

exhibit, organiser, location, viewing times etc. I would assume that many of the smaller collectors are happy to welcome interested viewers and that it may be necessary to arrange a suitable time. The list could, in this case, give a contact phone number.

Should there be a reasonable response to this idea, a suitable list could be prepared, kept up to date, and published in *AR* a suitable number of times per year.

RON GRAHAM VK4BRG
Box 323
SARINA 4737.

W6 Visiting Cairns

The following amateur is visiting the Cairns area from 25 September to 5 October and would like to meet or stay with locals, particularly anyone offering paid bed and breakfast service. He can afford to stay at the tourist traps but would prefer to taste Aussie hospitality. He is also looking for ideas as to how to make the most of his short stay. Monty has looked after many visitors at his Los Angeles home through the International Travel Host Exchange scheme and would be pleased to hear from intending visitors, even if they are not ITHE participants. Contact:

Monty Bancroft W6NJW
9921 Edmore Place
Sun Valley CA 91352 USA
Tel: 0011 1 818 767-3499

If you wish to be placed on the ITHE list (free service offered by the WIA), please contact me at the address below. Please advise your callsign/s, phone numbers, languages spoken and whether you want to accommodate visitors or just meet them.

ASH NALLAWALLA VK3CIT/ZL4LM
FEDERAL CO-ORDINATOR, ITHE AUSTRALIA
PO Box 539
WERRIBEE 3030.

CB and Amateur Radio

I read with interest both the editorial and the letter from Neil VK6NE in the June issue. The Sydney Radio Group is basically tackling the situation in reverse order. We started out as a CB group only, about eight years ago. Now we have about 18 amateurs in the group - six full call, one combined, and the rest limited. All are still very active on the CB band, keeping in touch with the rest of the group with a regularly weekly get-together on 27MHz.

The group has run both NAOCP and AOCP theory courses for members, using the video tapes from Gladesville Amateur Radio Club. We propose running a "CB Workshop" covering such subjects as power supplies, antenna theory, propagation and operating protocol. We hope it will generate pride in operating a good station and develop an interest in upgrading to the amateur bands. We have just completed a (wet) weekend operating under canvas in the Blue Mountains where unlicensed operators were given some hands-on experience talking on the amateur bands (club call is VK2SRG). We also publish a quarterly newsletter to keep members in contact with group activities.

Perhaps some of the "amateur only" clubs need to hold an "open day" every two or three months where interested CBers can come in and see and use an operating amateur station. Maybe even offered associate membership for a nominal amount. Encouragement, example, exposure, enlistment. Show them the way to expand their horizons and you may increase club membership and the amateur ranks.

JIM STEDMAN VK2XJX
SYDNEY RADIO GROUP
PO Box 185
GORDON 2072

Radio Theme Variations

The June editorial comment on amateur radio is a simple and precise statement of fact. Radio has "come of age" and is no longer a heady adventure. A solar outburst will perhaps provide conditions for the "specialists" to achieve a new VHF or UHF record.

All technologies mature, and radio has, in the past 20 years, become an acceptable norm - colour TV from the moon, IDD to anywhere, metal and fibre-optic cables plus satellites have linked together the world via telex, telephone, TV and now fax. The cellular phone system has destroyed privacy in developed areas, and CB extends the range of the shout over the fence with a useful anonymity!

What is left is the opportunity to pursue development, not necessarily in the straight line laboratory or commercial sense, but for the pleasure of exploring POSSIBILITIES, likely or unlikely, and re-examination of "past" techniques. Did they have virtues that were not perceived or achievable with available components? There are still frontiers in communication. Make up your own list of the aspects of operation and performance of equipment that you feel needs improving, and hang it on the wall with the QSLs. Solve one and add it to your awards list!

My original licence was headed Experimental Radio Licence - passive operation of a black box, no matter how complicated, can never equal full personal involvement with its sense of achievement. Cut and try a new antenna, dig in an earth plate and really get out on 160; use the excellent articles in *AR* and have a first-class mobile; oh, and check out the antenna system.

A club field day with a field strength meter for comparisons can be instructive.

You have the privilege to investigate every aspect of the frequencies allocated and the equipment you can acquire or devise to utilise them. A multitude will co-operate in the testing process. Maybe our executive should be more active in this "mode"?

ROBERT R MCGREGOR VK3XZ
2 WILTSHIRE DRIVE
SOMERVHLE 3912

Long Live CW

I thought it was time to put pen to paper and write my thoughts on a debate that became extremely heated on a 2m repeater recently.

Yes, it's on again - the CW debate. Well, first of all, I am a full call. I got this at 25 years of age. I, like so many others, found the task hard and sometimes annoying (along with all the other excuses you hear), but the success of a pass at 10 words per minute brought satisfaction. It was something new. Yes, it may be old in its history, but new to the individual. This brings me to my argument. Yes, I found it hard, but it is part of the whole hobby I am interested in. There are lots of directions to take - ATV, digital, satellite and many others. But, where did it all start? Well, it started with those "home brewers" who built the CW transmitters that conquered the world on QRP. There would be no amateur radio, if not for these people.

Nobody is asking it to stand still (God forgive! Long live progress), but it is part of our hobby. Now, for those lazy people who believe it is their God-given right to just show up anywhere at 400 watts, just because they have some *theory* technical ability, you are joking!

Let's continue the CW, sort out the men from the boys, and see who is genuine interested in the hobby, which means its future and, most of all, its colourful past.

LONG LIVE CW.
GEOFF MARSH VK2GRM
10 LANDAIS PLACE
EMU PLAINS 2750

Morse Transmissions

I feel Slow Morse listeners in VK4 deserve some explanations as to why the timetable as published in *AR* and the Call Book has not been accurate for the past year. Apologies to all those who tried unsuccessfully to extract information.

It all started with a letter sent by TARC, but not by me, in July last year, and in spite of regular updates and corrections being forwarded for publication, the contents of this ill-fated letter are still appearing in *AR*.

Apologies to Mount Isa VK4WII was a misprint for Brisbane VK4WIL. Apologies to Sunshine Coast - your enthusiastic efforts on 3542kHz were good listening, but not part of the official timetable.

For those who really want to know, the present timetable is:

Monday	Townsville Amateur Radio Club	VK4WIT
Wednesday	Townsville Amateur Radio Club	VK4WCH
Thursday	Gladstone area	VK4AV
Sunday	Sunshine Coast Amateur Radio Club	VK4WIS

Time: 0930 UTC (some stations go to 0830 during summer time)
Frequency 3535kHz

Clubs, groups or individual operators interested in sending Slow Morse sessions on Tuesday, Friday or Saturday nights contact the

Slow Morse Co-ordinator via TARC, PO Box 964, GPO Townsville 4810, or call back on one of the sessions.

SALLY GRATTIDGE VK4MDG
SLOW MORSE CO-ORDINATOR (QUEENSLAND)
ar

Innovation?

I refer to your issue of April 1989, page 64, in which reference was made to the resignation of Fred Swainston from the position of VK3 Divisional Education Officer. The statement was made that "Fred innovatively pioneered revision weekends" - presumably in the lead-up to DoTC examinations.

I must point out that the WIA NSW Education Service and Youth Radio Scheme had conducted Study Weekends years ago. Camp Technology was organised, using accommodation at Mount Victoria year after year. Also, at Katoomba we used a Catholic seminary to accommodate quite popular study sessions just prior to DoTC testings. There are many present-day amateur operators who benefited by these seminars.

With all due respect to Fred, whose reference book is of great benefit to amateur radio students, I feel that the "innovatively" designation is not quite appropriate.

REX BLACK VK2YA
562 KOORINGAL RD
WAGGA WAGGA 2650 ar

Handybridge Impedance Bridge for HF

(Continued From page 9)
cannot get yours to work satisfactorily, please write to me about it and any reasonable amount of help will be returned (SASE, please).

Parts

All the components should be available from the usual electronics suppliers. The 100 + 200pf variable capacitor and all other parts were obtained from Truscotts Electronic World ([03] 723 3860 - will answer mail orders). Suppliers of Amidon cores also regularly advertise in this journal.

References and Further Reading

1. *Radio Handbook* - Orr
2. *Solid State Design* - Hayward & DeMaw
3. A Simple Impedance Bridge Diamond VK3XU, *AR* May '89
4. Measuring Small Coils and Capacitors - Novite Notes *AR* May '88
5. Any recent *ARRL Handbook*.

Parts List

Capacitors

3.3pF NPO ceramic	C5, C7
27pF (nominal) NPO ceramic	C3
100pF (nominal) styroseal	C2
220pF (nominal) styroseal	C1
100 + 200pF air variable	C4
0.01µF ceramic	C11
0.047 (or 0.1) vF or monolithic	C6, C8, C9, C10.

Resistors

100ohm 1/2W 5%	R2, R6, R8 (2)
1k linear (A) pot with long 1/4" shaft	R7
47kohm 1/2W 5%	R1
100kohm 1/2W 5%	R4, R5
220kohm 1/2W 5%	R3.

Semiconductors

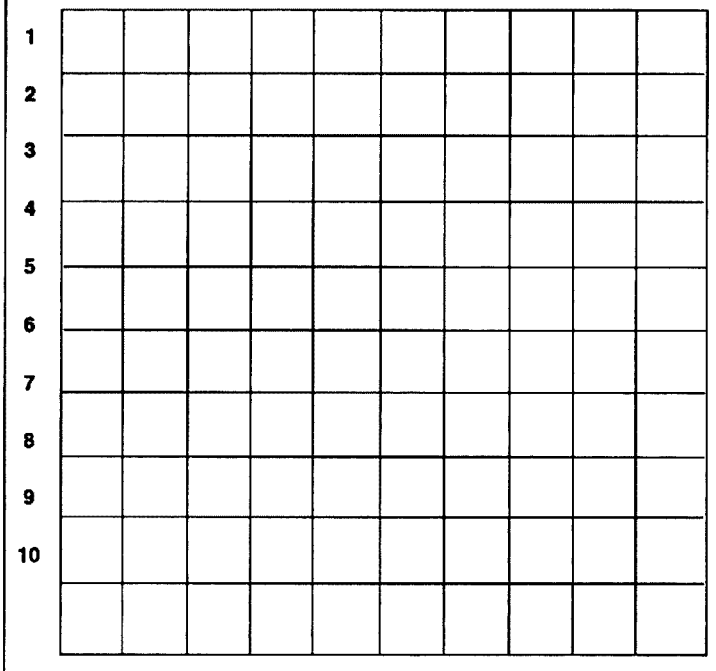
MPF102, 2N5457 etc	Q1
MFE131, 40673 etc	Q2
1N914, 1N4148	D1
Germanium diode, OA91, OA95	D2.

Miscellaneous

Case to suit, Amidon T68-1, T68-2 (2), T68-6, FT50-43, FB43-101 bead, #22 and #24 enamel wire, 4 or 5-pin line plugs (4), line socket, coax socket, 6.5mm knitting needles (4), on/off switch, tag strips (3), knobs, reduction drive (Dick Smiths), flexible coupler, perspex for cursor and battery holder, 9V type 216 battery and connector, 250mA meter, hook-up wire, screws, nuts, epoxy glue etc. ar

Solution Page 56

Morsewood No 53



Across
1 Sense
2 Carry
3 Church house
4 Prevalent
5 Sins
6 Ode
7 Marries
8 Skin
9 Taste, for one
10 Boast

Down
Tarts
2 Picture
3 Look intently
4 Hand
5 Pretent
6 Tier
7 Chooks
8 Post
9 You have, thou ..
10 Note of the scale

Audrey Ryan © 1991

HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

This month, two DXpeditiona are scheduled: one to Myanmar, previously known as Burma, and one to Annobon Island, which is in the Gulf of Africa, south of Nigeria and west of Gabon. For Myanmar, the Asian predictions should serve. For the Annobon Island DXpedition (3C0), I have produced the three 14 MHz signal strength versus time (UTC) graphs, shown in Figure 1 here, assuming 400 watts transmit power, all other parameters being as usual.

The Tables Explained

The tables provide estimates of signal strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column, the second column lists the predicted MUF, the third column the signal strength in dB relative to 1 µV (dBU) at the MUF. The fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency.

The signal strengths are all shown in dB relative to a reference of 1 µV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point 'standard' where S9 is 50 µV at the receiver's input and the S-meter scale is 6 dB/S-point.

µV in 50 Ohms	S-points	dBU
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	-2
0.39	S2	-8
0.2	S1	-14

The tables are generated by the Graph-DX program, assuming 100 W transmit power output, modest beam antennas (e.g. three-element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST. The major part of NSW and Queensland.

VK SOUTH. Southern-NSW, VK3, VK5 and VK7.

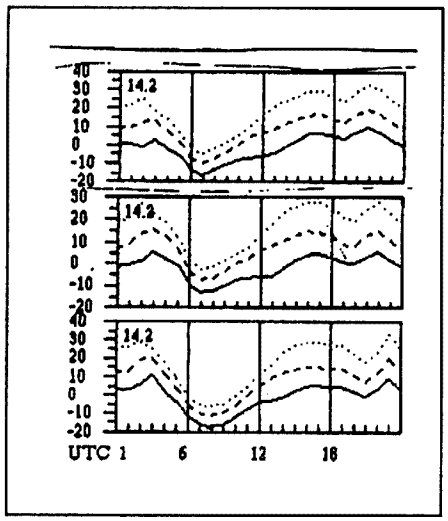


Figure 1. 14 MHz signal strength predictions for the Annobon Island DXpedition. Top chart: VK East, then VK South, with VK West at the bottom. Solid line 90% of days, dashed line 50% of days, dotted line 10% of days. UTC time, 1 to 24 hours, left to right.

VK WEST. The south-west of West Australia.

VK EAST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.4	5	13.2	-1	5	4	-1	-9
2	17.3	-1	13.0	-10	0	1	-2	-9
3	20.8	0	15.5	-21	-4	0	1	-2
4	26.0	3	19.7	-34	-9	-1	3	2
5	27.6	2	20.8	-37	-12	-3	1	1
6	27.0	1	20.4	-38	-12	-3	1	1
7	25.9	1	19.6	-35	-11	-3	1	0
8	24.3	1	18.4	-27	-7	0	1	0
9	22.3	1	16.8	-19	-3	1	1	-2
10	20.0	2	15.1	-10	1	2	0	-6
11	18.0	4	13.6	-2	4	3	-3	-12
12	16.2	7	12.2	5	6	1	-8	-20
13	14.9	11	11.2	11	7	-1	-13	-29
14	14.0	16	10.4	16	7	-4	-20	-39
15	13.3	22	10.1	20	6	-7	-27	...
16	12.7	25	9.5	21	4	-11	-33	...
17	12.4	27	9.4	21	3	-14	-37	...
18	11.4	29	8.7	17	-3	-22	...	...
19	10.4	30	7.9	12	-11	-33	...	...
20	11.0	30	8.5	15	-6	-27	...	...
21	14.5	27	10.8	28	13	0	-19	...
22	19.5	22	15.0	32	25	17	7	-5
23	18.0	20	13.8	23	20	14	4	-7
24	19.7	14	15.0	12	15	12	6	-2

VK STH - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.5	10	13.3	7	10	7	0	-10
2	17.3	2	13.0	-4	3	2	-2	-10
3	20.9	2	16.4	-16	-1	2	1	-2
4	26.2	3	19.9	-29	-7	0	3	2
5	27.0	2	20.2	-34	-10	-2	2	1
6	26.7	1	20.0	-35	-11	-3	1	0
7	26.0	1	19.5	-34	-11	-2	0	0
8	24.7	1	18.5	-29	-8	-1	1	-1
9	22.8	1	17.1	-22	-4	0	0	-2
10	20.7	1	15.5	-13	0	2	0	-6
11	18.0	2	13.5	-5	2	1	-4	-13
12	15.8	5	11.8	3	4	-1	-10	-23
13	13.9	8	10.3	8	3	-6	-20	-38
14	12.5	13	9.2	11	0	-13	-33	...
15	11.6	21	8.6	13	-4	-21	...	...
16	11.3	25	8.3	14	-6	-26	...	...
17	10.9	27	8.1	13	-9	-30	...	...
18	10.8	29	8.1	13	-10	-32	...	...
19	10.1	29	7.7	9	-16	...	...	...
20	9.6	30	7.3	5	-22	...	...	...
21	10.3	29	7.9	10	-14	-38	...	...
22	13.2	27	10.3	23	6	-10	-33	...
23	15.8	23	12.2	26	17	7	-6	-22
24	20.1	18	15.2	21	20	16	8	-1

VK WEST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.1	16	12.2	17	12	5	-7	-21
2	15.9	7	12.0	5	6	1	-8	-20
3	19.2	4	15.1	-5	4	4	0	-7
4	23.9	4	18.2	-16	0	4	4	1
5	25.2	2	19.5	-22	-4	1	2	0
6	24.8	1	18.7	-26	-6	0	1	-1
7	24.6	1	18.6	-27	-7	-1	0	-1
8	24.2	0	18.3	-25	-6	0	0	-2
9	23.2	1	17.6	-22	-4	0	0	-3
10	21.8	1	16.5	-15	-1	1	0	-5
11	20.1	3	15.1	-6	2	3	-1	-9
12	18.0	6	13.6	3	6	2	-5	-16
13	16.3	9	12.3	10	7	0	-11	-25
14	14.7	14	11.1	14	6	-4	-20	-39
15	13.6	20	10.2	18	4	-10	-31	...
16	12.8	23	9.6	18	1	-16	...	...
17	12.2	25	9.3	17	-2	-21	...	...
18	11.6	27	8.7	15	-6	-27	...	...
19	11.3	28	8.6	14	-9	-30	...	...
20	10.4	28	7.9	9	-17	...	...	...
21	9.5	29	7.3	2	-27	...	...	...
22	10.0	29	7.7	6	-22	...	...	...
23	13.1	26	9.8	22	3	-14	-38	...
24	16.6	24	12.7	29	19	10	-4	-19

VK EAST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.2	8	11.0	7	8	4	-3	-13
2	15.6	11	10.7	11	10	4	-4	-16
3	15.0	15	10.3	15	11	4	-7	-20
4	14.2	17	9.8	17	10	2	-11	-26
5	14.2	21	9.9	21	13	3	-11	-28
6	14.8	22	10.3	23	15	5	-8	-24
7	17.1	22	12.0	26	20	12	1	-11
8	17.6	15	13.7	19	15	8	-2	-14
9	15.4	10	11.9	10	7	1	-9	-23
10	13.5	2	10.4	3	2	-4	-15	-29
11	12.1	-9	9.2	-2	-1	-6	-17	-30
12	11.2	-17	8.5	-4	-2	-6	-16	-29
13	10.8	-37	8.4	-16	-11	-15	-24	-38
14	10.4	...	7.9	-30	-23	-26	-37	...
15	10.1	...	7.8	...	-32	-35	...	...
16	9.5	...	7.3	...	...	...	...	...
17	9.0	...	7.0	...	...	...	...	...
18	9.7	...	7.6	...	...	...	...	...
19	12.3	...	9.2	-27	-15	-15	-21	-31
20	16.3	-10	13.0	-19	-6	-3	-5	-11
21	20.4	-2	14.2	-22	-5	-1	-1	-5
22	19.0	0	13.1	-14	-1	1	0	-4
23	19.0	3	12.4	-5	3	3	0	-6
24	17.2	6	11.7	1	6	4	-1	-9

VK STH - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.5	5	10.8	3	5	2	-6	-16
2	15.0	8	10.4	8	7	1	-8	-20
3	14.3	12	10.0	12	8	0	-11	-26
4	13.6	16	9.6	15	8	1	-10	-33
5	13.7	21	9.7	20	10	-1	-17	-34
6	14.2	21	10.1	22	12	1	-13	-30
7	16.2	20	11.6	23	16	8	-3	-17
8	17.3	16	13.5	19	14	7	-3	-16
9	15.0	11	11.7	11	7	0	-12	-27
10	13.3	3	10.3	4	1	-6	-18	-34
11	11.9	-5	9.1	0	-2	-9	-21	-37
12	11.1	-13	8.5	-2	-3	-9	-20	-34
13	10.7	-29	8.4	-11	-8	-14	-25	-39
14	10.3	...	7.9	-27	-22	-27	-39	...
15	10.0	...	7.7	...	-35	-39	...	...
16	9.3	...	7.2	...	...	...	...	...
17	9.0	...	7.0	...	...	...	...	...
18	9.6	...	7.6	...	...	...	...	...
19	11.8	...	8.9	...	-28	-28	-34	...
20	15.3	-15	12.2	-20	-7	-4	-6	-12
21	19.0	-6	14.0	-26	-8	-4	-3	-7
22	18.4	-5	12.9	-22	-6	-2	-2	-6
23	17.4	-3	12.1	-14	-2	0	-2	-8
24	16.5	1	11.5	-5	2	1	-3	-11

VK WEST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.1	-6	10.5	-8	-2	-3	-9	-17
2	14.5	-2	10.2	-3	0	-3	-11	-21
3	13.9	1	9.8	1	1	-4	-13	-26
4	13.2	3	9.4	4	1	-5	-17	-31
5	13.3	7	9.5	7	3	-5	-18	-33
6	13.8	9	10.0	9	4	-3	-15	-30
7	15.7	12	11.4	12	9	2	-7	-20
8	18.1	13	13.1	14	13	8	0	-9
9	19.4	10	14.6	11	11	7	0	-9
10	17.0	8	13.2	8	8	5	-7	-18
11	14.9	0	11.4	-1	0	-4	-15	-25
12	13.1	-8	10.0	-5	-3	-7	-16	-28
13	11.7	-18	8.9	-7	-4	-8	-17	-29
14	10.9	...	8.5	-20	-15	-19	-28	...
15	10.5	...	8.2	-35	-28	-31	...	...
16	10.1	...	7.7	...	...	...	...	...
17	9.8	...	7.5	...	...	...	...	...
18	9.2	...	7.1	...	...	...	...	...
19	8.8	...	6.9	...	...	...	...	...
20	9.5	...	7.5	...	...	...	...	...
21	11.6	...	8.7	-38	-25	-26	-33	...
22	15.1	-16	12.1	-20	-8	-6	-9	-15
23	16.9	-11	11.9	-22	-8	-5	-6	-11
24	18.0	-8	11.2	-15	-5	-3	-7	-13

APOGEE ARTS

VK EAST - AFRICA

UTC	MUF	d6U	FOT	14.2	18.1	21.2	24.9	28.5
1	11.2	6	8.9	5	-5	-19	-39	...
2	10.7	0	6.2	3	-5	-16	-34	...
3	10.9	-7	8.4	0	-4	-14	-29	...
4	14.6	-2	11.4	-3	0	-3	-12	-24
5	20.6	3	15.9	-9	1	3	0	-6
6	23.6	5	17.6	-12	0	3	2	-2
7	22.5	2	16.8	-12	0	3	1	-4
8	20.8	3	15.5	-8	2	3	-1	-7
9	18.9	3	14.1	-3	3	2	-3	-12
10	16.5	3	12.3	0	3	0	-9	-20
11	14.4	4	10.7	4	2	-5	-17	-32
12	12.7	5	9.4	6	0	-10	-26	...
13	11.4	10	8.4	7	-4	-18	-39	...
14	10.7	16	7.8	8	-8	-25	...	...
15	10.3	24	7.7	10	-11	-31	...	...
16	9.9	27	7.3	9	-14	-36	...	...
17	9.6	29	7.2	8	-17	...	...	...
18	9.0	31	6.8	4	-23	...	...	...
19	8.6	32	6.6	2	-27	...	...	...
20	9.3	31	7.1	6	-21	...	...	...
21	9.5	31	7.3	7	-19	...	...	...
22	8.9	27	6.9	3	-24	...	...	...
23	8.6	16	6.7	0	-24	...	...	...
24	9.2	9	7.3	1	-17	-36	...	...

VK STH - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	11.0	13	8.4	9	-3	-18	...	...
2	11.3	7	8.7	7	-3	-15	-34	...
3	15.2	8	11.3	8	6	0	-11	-25
4	21.4	9	16.5	4	10	9	4	-3
5	24.5	6	19.8	-4	6	8	6	0
6	25.8	5	20.8	-7	4	7	6	2
7	25.3	5	20.2	-8	4	7	5	1
8	24.0	5	19.1	-5	5	7	4	0
9	22.2	6	17.6	-1	6	7	3	-3
10	20.2	7	15.9	3	8	6	0	-8
11	17.8	8	13.9	6	7	3	-5	-17
12	15.3	9	11.9	10	6	-1	-14	-29
13	13.6	13	10.5	12	3	-7	-24	...
14	12.2	19	9.3	14	0	-16	-37	...
15	11.5	24	8.8	15	-3	-21	...	...
16	11.0	27	8.4	14	-6	-26	...	...
17	10.6	29	8.1	13	-9	-31	...	...
18	10.2	30	7.8	11	-13	-36	...	...
19	9.5	31	7.4	7	-19	...	...	...
20	9.4	51	7.3	6	-21	...	...	...
21	10.0	50	7.9	10	-14	-38	...	...
22	9.8	31	7.4	8	-18	...	...	...
25	9.3	26	7.2	5	-20	...	...	...
24	9.9	18	7.8	6	-13	-33	...	...

VK WEST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	9.9	19	7.6	7	-13	-33	...	...
2	11.3	12	8.7	9	-2	-17	-37	...
3	15.2	11	11.4	11	7	0	-12	-27
4	21.5	9	16.7	6	11	9	4	-3
5	25.1	6	19.1	-1	8	9	7	1
6	25.2	5	18.9	-6	5	7	5	0
7	24.9	4	18.6	-8	4	6	4	0
8	24.2	4	18.1	-8	3	5	4	-1
9	23.0	4	17.3	-6	4	5	2	-3
10	21.3	6	16.0	0	7	6	1	-6
11	19.3	8	14.4	5	8	5	-2	-12
12	16.8	10	12.6	10	8	2	-9	-22
13	14.7	13	11.0	14	6	-3	-18	-36
14	13.0	18	9.6	16	5	-1	-31	...
15	11.7	24	8.6	16	-2	-20	...	...
16	10.9	27	8.0	14	-7	-28	...	...
17	10.5	29	7.9	13	-10	-32	...	...
18	10.2	31	7.6	11	-13	-36	...	...
19	10.0	31	7.5	11	-14	-38	...	...
20	9.4	32	7.1	7	-20	...	...	...
21	8.9	33	6.8	4	-25	...	...	...
22	9.6	32	7.4	8	-18	...	...	...
23	9.9	32	7.5	10	-14	-38	...	...
24	9.2	29	7.0	6	-20	...	...	...

VK EAST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	20.4	17	17.3	20	20	15	6	-5
2	20.1	17	17.2	21	20	15	5	-6
3	19.9	17	16.0	22	20	15	5	-7
4	19.4	19	14.7	24	21	15	4	-9
5	18.6	21	14.1	28	22	14	1	-13
6	17.4	25	13.1	33	23	12	-3	-20
7	15.9	28	12.0	34	20	7	-11	-31
8	14.1	31	10.7	30	13	-2	-24	...
9	12.7	33	9.6	26	6	-12	-37	...
10	11.4	35	8.5	21	-3	-24	...	...
11	10.4	36	7.8	15	-11	-36	...	...
12	9.7	37	7.3	11	-18	...	...	...
13	9.3	38	7.0	7	-23	...	...	...
14	8.9	38	6.7	4	-28	...	...	...
15	6.7	39	6.6	2	-30	...	...	...
16	8.1	39	6.2	-3	...	...	...	...
17	7.4	40	5.7	-11	...	...	...	...
18	7.8	40	6.1	-6	...	...	...	...
19	10.2	33	7.6	13	-12	-37	...	...
20	13.9	24	10.8	23	10	-4	-24	...
21	17.3	20	13.4	24	18	9	-4	-19
22	19.5	18	15.0	23	21	14	4	-8
23	20.3	17	15.9	22	21	15	6	-5
24	20.6	17	16.9	21	20	16	7	-4

VK STH - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	22.4	11	16.9	16	17	13	6	-4
2	22.3	11	16.7	18	17	13	6	-4
3	22.1	12	16.6	18	18	14	5	-5
4	21.9	13	16.4	21	19	14	5	-5
5	21.2	15	16.0	25	21	15	5	-7
6	19.8	19	14.9	32	24	15	1	-13
7	18.1	22	13.6	34	22	10	-5	-23
8	16.0	24	12.1	31	16	2	-17	-39
9	14.4	26	10.8	27	9	-7	-31	...
10	12.8	29	9.6	22	0	-19	...	...
11	11.5	30	8.6	16	-9	-34	...	...
12	10.4	31	7.7	9	-21	...	...	...
13	9.7	32	7.2	3	-29	...	...	...
14	9.4	55	6.9	1	-33	...	...	...
15	9.1	33	6.7	-2	-38	...	...	...
16	8.9	34	6.7	-3	...	...	...	...
17	8.3	35	6.3	-9	...	...	...	...
18	7.9	35	6.0	-15	...	...	...	...
19	8.5	29	6.5	-8	...	...	...	...
20	10.8	19	8.4	7	-15	-37	...	...
21	14.4	15	11.1	15	4	-8	-28	...
22	18.0	13	13.8	17	13	5	-7	-23
23	20.6	12	15.7	17	16	11	1	-10
24	21.9	11	16.6	16	17	13	4	-6

VK WEST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.6	8	20.2	4	12	13	10	5
2	27.3	8	20.5	3	12	13	11	6
3	27.1	8	20.5	4	13	14	11	6
4	26.8	9	20.1	7	14	15	11	6
5	26.3	10	19.7	12	17	17	12	6
6	25.1	13	18.8	21	22	19	13	5
7	23.3	16	17.5	29	26	21	12	2
8	21.1	20	15.9	34	27	19	8	-4
9	18.5	23	13.9	34	24	14	0	-15
10	16.4	25	12.3	32	20	8	-9	-27
11	14.5	28	10.8	29	14	0	-20	...
12	13.1	30	9.7	26	8	-8	-31	...
13	12.2	31	9.0	23	3	-15	...	...
14	11.5	32	8.5	20	-1	-21	...	...
15	11.2	32	8.4	18	-4	-25	...	...
16	10.8	33	8.0	17	-6	-28	...	...
17	10.5	33	7.9	15	-8	-30	...	...
18	9.7	34	7.4	11	-14	-39	...	...
19	9.5	30	7.2	8	-17	...	...	...
20	10.2	20	7.8	9	-11	-31	...	...
21	13.2	15	9.7	13	3	-9	-28	...
22	17.7	12	13.6	13	11	5	-5	-18
23	22.1	10	17.0	9	13	11	5	-3
24	25.3	9	19.2	6	13	13	9	3

VK EAST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	28.5	4	21.4	-26	-4	2	5	4
2	27.1	7	21.1	-13	2	7	8	6
3	25.4	11	20.4	0	10	13	12	8
4	24.1	15	19.3	14	18	18	14	8
5	23.5	19	18.7	27	26	23	17	9
6	23.0	22	18.2	36	31	26	18	10
7	22.1	22	17.5	37	31	24	15	5
8	21.0	22	15.9	37	29	21	10	-1
9	19.2	23	14.4	36	26	17	5	-9
10	17.5	24	13.1	34	23	12	-2	-18
11	16.2	25	12.1	32	19	7	-8	-26
12	15.2	26	11.3	29	18	3	-15	-35
13	14.2	25	10.6	25	11	-2	-21	...
14	13.4	19	10.0	18	6	-7	-25	...
15	12.8	12	9.7	11	2	-9	-26	...
16	11.7	0	8.9	3	-3	-13	-29	...
17	10.4	-13	8.0	-1	-6	-15	-31	...
18	10.9	-18	8.4	-4	-5	-12	-24	...
19	14.5	-10	11.2	-11	-3	-5	-11	-21
20	20.1	-2	15.5	-22	-5	-1	-2	-7
21	25.0	0	19.2	-32	-10	-2	0	-1
22	27.8	2	21.2	-37	-12	-2	1	1
23	28.5	2	21.7	-37	-11	-2	2	2
24	28.7	3	21.7	-33	-9	-1	3	3

VK STH - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.8	4	21.6	-24	-4	3	5	4
2	27.5	7	20.5	-10	4	8	9	6
3	26.8	10	20.3	2	12	14	12	8
4	25.6	14	19.8	16	20	19	15	9
5	25.0	16	18.9	27	26	23	17	9
6	23.4	19	17.5	34	29	24	15	5
7	21.2	21	15.8	35	28	21	10	-1
8	18.4	23	13.7	34	24	14	1	-13
9	16.2	25	12.0	31	18	6	-9	-28
10	14.2	27	10.5	27	11	-3	-23	...
11	12.7	28	9.4	22	4	-12	-36	...
12	11.8	29	8.7	19	-1	-20	...	...
13	11.4	26	8.5	15	-4	-23	...	...
14	11.1	18	8.2	10	-6	-23	...	...
15	10.9	6	8.2	6	-6	-20	...	...
16	10.2	-5	7.7	1	-7	-20	-39	...
17	9.6	-16	7.3	-1	-7	-18	-36	...
18	10.3	-19	7.9	-3	-5	-12	-26	...
19	13.4	-12	9.8	-9	-3	-6	-13	-25
20	18.2	-5	14.0	-19	-5	-2	-4	-10
21	22.8	0	17.5	-28	-8	-2	0	-3
22	26.1	1	19.9	-34	-10	-2	1	0
23	27.5	2	20.8	-35	-10	-2	2	2
24	28.1	3	21.1	-32	-8	0	3	3

VK WEST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	27.2	3	20.7	-36	-11	-1	3	3
2	26.3	5	20.8	-28	-6	2	5	5
3	24.5	8	19.6	-17	1	6	8	6
4	23.2	10	18.5	-5	7	10	10	6
5	22.4	14	17.8	7	14	15	12	6
6	21.9	18	17.3	18	21	19	14	7
7	20.9	22	16.9	28	26	22	14	6
8	20.1	26	15.7	35	30	23	14	4
9	18.9	27	14.6	37	29	21	11	-1
10	17.5	27	13.4	35	25	15	1	-13
11	15.7	28	11.8	32	20	8	-8	-27
12	13.8	29	10.3	28	13	-1	-21	...
13	12.4	28	9.3	22	6	-10	-32	...
14	11.6	21	8.6	15	1	-14	-37	...
15	11.3	12	8.5	10	-1	-14	-34	...
16	11.0	2	8.2	5	-2	-13	-30	...
17	10.9	-6	8.2	2	-2	-10	-25	...
18	10.3	-16	7.8	0	-2	-9	-23	...
19	9.6	-38	7.3	-9	-10	-17	-31	...
20	10.3	...	8.0	-16	-12	-17	-29	...
21	13.6	-16	10.0	-12	-2	-2	-7	-16
22	18.4	-6	14.2	-25	-7	-2	-2	-6
23	23.0	-1	17.6	-35	-11	-3	0	-1
24	26.1	1	19.9	-39	-13	-3	1	1

VK EAST - USA/CARIBBEAN

VK STH - USA/CARIBBEAN

VK WEST - USA/CARIBBEAN

APOGEE ARTS

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

Lea Downing VK4FX

Lea passed away on 20 June 1991 in the Bundaberg Base Hospital. He was 83 years old, and had moved from Gympie to Bundaberg many years ago. He was an active member of the local amateur radio club.

As a youth, Lea trained as a motor mechanic and, during the Second World War, he served with the Royal Australian Air Force as an aircraft engine maintenance fitter in New Guinea.

Prior to his retirement Lea conducted his own business of refrigeration service.

Lea had been interested in radio almost all of his life and held the call VK4FX since October 1963. Lea had been quite active on most bands.

His many interests include music and photography. For many years he was the official cine stringer photographer for the ABC in Bundaberg; in recent years he took an interest in video photography.

Lea will be sadly missed by the many friends and fellows amateurs who knew him.

Due to his influence and interest in amateur radio, his two daughters and two grandsons have callsigns: Ann VK4VAW, Kay VK4MQG, David VK4VOW, Michael VK4MLD.

To his two daughters, Ann and Kay, and their families, we extend our sympathy.

LES BRENNAN VK4XJ ar

We regret to announce the recent passing of:

Mr C Jeffery	VK2ACK
Mr J Trevena	VK2APT
Mr F L Barrett	VK2ECR
Mr T R Smith	VK3KQI
Mr R C Rivington	VK3NHI
Mr L Downing	VK4FX
Mr R Shartell	VK4ARS/VK3RS
Mr D A Ward	L40232
Mr T Reilly	VK5AI
Mr D Thornley	VK5NOD
Mr I Shearer	VK8IS

HAMADS

TRADE HAMADS

● AMIDON ferromagnetic cores: for LF/HF/VHF/UHF applications. Send DL-size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office, please ... 14 Boanyo Av, Kiama). Agencies at: Goeff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscott Electronics, Melbourne.

● LOGMASTER: Radio logkeeping software $69. Codemaster: Morse training/proficiency software $49, endorsed by Officers of Signals Schools of Aust Army. Both products include manuals for IBM/clones PC, XT, AT. Information/order: Milestone Technologies P/L PO Box 699, Mt Waverley Vic Australia 3149. Tel (03) 807 6767. 8 Greenham Cres, Mt Waverley 3149.

● WEATHER FAX programs for IBM XT/ATs * Radfax2 is a high resolution shortwave weatherfax, morse & RTTY receiving program. Needs CGA, SSBhf radio & radfax decoder. Also RF2HERC, RF2EGA and RF2VGA, same as RADFAX2, but suitable for Hercules, EGA and VGA cards respectively, $35 * SATFAX is a NOAA, meteor and GMS weather satellite picture-receiving program, uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, & WEATHER FAX PC card, & 137MHz receiver, $45 * All programs are on 5.25" or 3.5" disks (state which) & documentation, add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm Old 4005. Ph (07) 358 2785.

FOR SALE - NSW

● DECEASED ESTATE VK2ECR current Kenwood TS440S $1500. TS680S $1200. PS50 $350. FL2100B $700. FL2100Z $950. Mactronics Terminal RTTY etc $350. Sig Gen $250. BWD CRO 824 35MHz $400. Many other bits & pieces. Jack VK2APT QTHR (044) 76 7961.

● TANDY TRS80 computer, Model III twin drive with DMP106 Tandy printer and word processor software $450. VK2BZM David QTHR (02) 498 2259.

● DECEASED estate. Kenwood TS940S HF txvr $2500. Mike MC85 $50. Linear amp TL922 $1500. 2m txvr TM2570 $425. Icom hand-held IG2GAT $425. Tower with beam rotator controls $1950. 1kW dummy load $200. Other items available. (02) 580 5190.

● UNUSED Telereader CWR 685E. John VK2DEJ (02) 809 5686.

● MICROBEE 32K series 3 with word processor and Telecom 3 built in Mitsubishi high resolution amber monitor. Dot matrix printer 100cps. Tape drive with 93 programs, complete with back-ups. All manuals, magazines & original packing. All mint cond. $595. VK2MQ Brian (069) 47 1213 AH.

● YAESU 747GX S/N 9I200300 near new $1025. DSE multi-band receiver $80. Alinco DN-130MVZ power supply, s/no 9470004 $455. Bernard VK2FZH (02) 597 7427.

● YAESU FC707 ATU $250. Yaesu FT301D FP301D P/S FV301 ex VPO YO301 monitorscope $1400. Palomar TX100 HF linear $250. Webster Bandspanner mobile antenna 80-10m $150. VK2DB QTHR (063) 67 5095.

● AEA Pakrat 232 with AEA com Pakrat with fax for C-64. Includes RS232 interface for C64, as new cond. $500. Also Yaesu FT101Z digital fan, manual, original carton. Like new $625. Kirt VK2DOJ (02) 436 2618.

● KENWOOD TS130S $650. AT-180 $120. VK2AWA QTHR (066) 52 6135.

● DRAKE T4XC R4C transceiver L4B linear incl power supplies, manuals, all good working order $1500. Also Yaesu 757GX complete lineup $1800. Ian VK2CJP QTHR (02) 44 4985. SNS DRAKE 27743 5717 YAESU 4K131281 4K080406 4G070098 3L010089.

● KENWOOD TR851A 70cm all-mode txvr, unmodified, in carton, as new, $900 ONO. Terry VK2XAS (02) 724 9770.

FOR SALE - VIC

● YAESU FT101B SN:4G109924 in EC. Comp with manual, hand mike, AC/DC power cables, 4 spare final tubes and 2 spare drivers $670. FV101 matching VFO for FT101 SN:21406020. In EC, comp with manual $150. Yaesu desk mike to suit FT101, in EC $60. Philips FM828/25A Mk2 SN:68391 in VGC, tuned recently by Philips to 2m comp with mobile bracket, power cable and hand mike $170. David VK3THY QTHR (03) 646 1500 BH, (03) 434 7152.

● KENWOOD TM721A 2/70 Dual bander s/n 9081234 full duplex, CTCSS encode, multi scanning functions 45/35w O/P mob mount etc. Orig carton, EC, $890. Michael VK3EMJ QTHR (03) 531 9954.

● KEMTRONIC SSB 1000 180H 11m txvr. Microwave modules MMG 1296/144G transverter STC MTR 10-191D radiophone. Contact Roger VK3XRS (051) 56 8291.

● BATTERIES, Exide and Chloride lead acid cells $50 ea, and Power Sonic gell cells $100 ea. High current ratings, good cheap power supplies. Evan VK3EJV (03) 438 2878 AH.

● VALVES 572B one Cetron brand 80% efficient $95. One GE brand 50% efficient $30. Ferris standing wave bridge and field strength indicator model 30-100 $25. Four 2N250A transistors and mounting micas suitable for transistorised DC/DC converter $4. VK3EQO QTHR (03) 592 6236.

FOR SALE - QLD

● WORLD'S MOST WIDELY USED mobile radio, Kenwood TS440S in GC $1700. Also YK88SN SSB and YK88C CW filters $150 the pair. VK4CRR (074) 82 5272.

● CHIRNSIDE/TH6 6-element 3-band Yagi antenna, VGC. George VK4GB QTHR (07) 396 1838.

● KENWOOD TS520S with mike and manual in original carton, VGC $500. VK4ARB QTHR (07) 269 8848.

● ATU Emtronics 1.8 to 30MHz 300 watts $25. Linear amplifier (QQV03-20A) 433MHz, 10W in 40W out $60. 433MHz amp solid state 10W in 30W out $55. Spectrum analyzer, home brew $45. Video recorder (needs new heads) Beta-Sony $50. 50 to 54MHz transceiver, home brew, needs attention $50. VK4ZFQ. Not QTHR (077) 79 4641

● KENWOOD TS520S-3 spare finals digital display, R1000 full coverage receiver, TS440S transceiver with PS50 power supply, MC50 desk mike, Yaesu FL1000M linear amp, Werner Wulf triband Yagi antenna, complete with 90ft. RG8U coax. 40ft mast winch & guys. Icom-IC2A hand txvr-240V & adapter 12v adapter, extension aerial & speaker-mike, bat charger-4-NC batteries..Datong D70 morse tutor. George (070) 54 1043.

FOR SALE - SA

● KEN KP-202 2m FM handheld txvr crystals for 7 channels incl 4 repeaters, battery case, manual, exc working order. s/n PC13430 $100. VK5BVN QTHR (087) 24 9626 AH.

FOR SALE - WA

● GRID DIP Meter model TE15 0.44MHz-280MHz 6 coils plus old military crystal calibrator $120. VK6NAT (09) 384 8881.

WANTED - NSW

● YAESU Remote VFO FV-901-DM or FV-101-DM or FV102-DM, reasonable price offered for acceptable cond. Michael VK2BMV QTHR (02) 570 4642.

● 3EL TRIBAND BEAM TH3JR or similar. David VK2BZM QTHR (02) 498 2259.

WANTED - VIC

● KENWOOD TS-120S txvr, require copy of service manual and modifications. Will pay for costs and postage. David VK3THY QTHR (03) 434 7152 H, (03) 646 1500 W.

● VARICAP Diode BB122 suit DSE Commander VHF txvr VCO or info on available equivalent VK3XFO QTHR (03) 723 1694.

● 150W HF AM TX with modulator and PSU. Will collect. VK3BCV Jim (054) 60 4048.

● POWER SUPPLY 12v capable of 10 amps continuous contact. Steve VK3XSP QTHR.

WANTED - OLD

● SK800A TUBE base with faulty screen capacitor, also 4CX1000A or 4CX1500B tubes. Also heavy duty ceramic bandswitch for linear tank. John VK4TL (070 54 3677.

● COLLINS 32S2 receiver VK4CRO QTHR (07) 390 7762.

WANTED - SA

● TS820S power transformer 2m hand-held VK5NOT (088) 42 2913.

WANTED - WA

● YAESU FT200 parts, esp valves & any ext fittings for FM 2M 2/50ohms 100+W for d/load. VK6NST QTHR (09) 419 2951 any time.

● YAESU FT301 HELP needed. Measurements of RF levels at output of RF unit, noise blanker, filter and IF unit in CW mode at max drive. Gerry VK6GW QTHR.

● INTRUDER watch observers in VK6. Free tape, logs, postage and advice. Please help. Contact Graham VK6RO QTHR (09) 451 3561.

INTRUDER WATCH

GORDON LOVEDAY VK4KAL FEDERAL INTRUDER WATCH CO-ORDINATOR AVIEMORE RUBYVALE 4702

Summary for May 1991 Intruder Watch

Date	Time U/TC	Frequency in MHz 'M' or 'E'	Callsign if Heard	Mode	Hrs On	Logs X	Details of Traffic if known And Any Other Information
180591	1255	7000		J3E/U			Several stns on freq
130591	1242	7009.3		J3E			Multi ch Indon type language
210591	2139	7021	T30A	J3E			English (American) NOT amateur
1205	1237	7031		A1A			Alphanum grpe (33W/4U/UN/DLO)
1305	1246	7083.5		F1B		2	Pop music & teleph conv
mni	mni	14007		F1B		4	AWMO 1000Hz continuous
mni	0610+	14023		F1B	24	73	Probable source USR pattern
Dly	mni	14042		J3E	24	35	3kHz wide rad teleph
Dly	mni	14058+		A2	24	68	Helschreiber fax China??
010591	1030_	14070	VBX	A1A		21	Traffic out
1705	1401	14070.5	VRQ	A1A		5	Very rough sig off freq???
0205	0830+	14075	VRQ	A1A		52	Also VPC on 14075 & 085
010591	1030+	14085	NPO	A1A		18	4 & 5 letter group
This bracket of stations also includes KFB, NZB, VPC, all sending similar tfc							
2204	0905	14140	UMS	F1B	18	17	Also A1A, 250Hz shift
0605	1215	14145		F1B		4	1000Hz shift 3rd register USR
040591	0800+	14170/1	UMS	F1B	18	20	Mxd modes 250Hz
0505	1035_	14172	3UGE	A1A			also XPLW
0205	0850+	14185		F1B	24	15	RTTY 250Hz
040591	0900	14200	VMO	A1A			VLQ de VMO
2904	0900	14202		F1B		16	
Dly	mni	14211	3SM	multi		57	RTTY mode 250Hz shift
200491	0045	14217	UMS	multi	24	20	5 fig blocks cypher 3kHz wide
0605+	mni	14218		F1B		5	RTTY 50Hz
2004	0840+	14220		multi		10	RTTY 250Hz/USR pattern
150591	0529	14270	???	A3E		1	Radio France International
News headings in French and current affairs 2nd harmonic of 7135MHz????							
0305	1245	18072		A3E		3	DL/BY language lessons!!!
2004	0055	21032	UMS	F1B+	24	31	Moscow Naval USR/1D in A1A
030591	0358	21115	CQ5	A1A		21	
0805+	0930+	21150	-	R7B		7	4-21kHz wide
190491	0600+	21283	UMS	F1B+	24	31	250Hz/A1A 3rd register USR
190491	0605	21347+		fax	24	37	Wx fax not directed to VK
0505+	0738+	21355	R Mosc	A3E		5	Rad Moscow in Russian
1705	1130	21435		A3E??			I make a guess at mode????
1005	0746	28478		F1B		7	RTTY (not enough info)
0705	0922	28980		A3E		6	Russian language talk USR

My thanks for this summary to VKs 2PS, 2COX, 2EYI, 3DVT, 3KCD, 4BG, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 5GZ, 5TL, 6RO, 6XW & 7RH.
Many logs have insufficient info to be included in this summary; please take more time to ascertain callsigns from broadcasting stations. Thank you. ar

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300,
Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

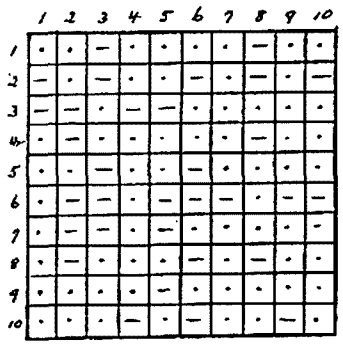
*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

State: .....

Not for publication: ❑ Miscellaneous ❑ For Sale ❑ Wanted

Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 52 P 49



Solution to Morseword No 53

Across: 1 feel; 2 cart; 3 manse; 4 rife; 5 errs; 6 poem; 7 weds; 8 rind; 9 sense; 10 skite.

Down: 1 pies; 2 image; 3 gaze; 4 fist; 5 fake; 6 rank; 7 hens; 8 mail; 9 hast; 10 lah.

TRADE PRACTICES ACT

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.

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the boxholder or seller of the goods.

TYPESETTING : Magazine Graphics, PO Box 72, Caulfield Sth, 3162, Ph: 528 1033

PRINTING: Industrial Printing, Richmond

MAIL DISTRIBUTION: R L Polk & Co Pty Ltd, PO Box 140, Collingwood, Vic. 3066, Tel:(03) 417 5161

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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HOW TO JOIN THE WIA

Fill out the following form and send to:

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Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

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VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200UTC on 3.555 MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 Mhz

WIA Divisional Bookshops

The following items are available from your Division's Bookshop
(see the WIA Division Directory on page 3 for the address of your Division

	Ref	Price to Members
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Ant. Compendium Vol 2 Software only	BX293	$18.00
Antenna Compendium Vol 1 ARRL	BX163	$19.80
Antenna Compendium Vol 2 & Software ARRL	BX294	$32.40
Antenna Compendium Vol 2 ARRL	BX292	$21.60
Antenna Handbook - Orr	BX217	$15.60
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Not all items above are available from all Divisions (and none are available from the Executive Office).
If the item is carried by your Divisional Bookshop, but is not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
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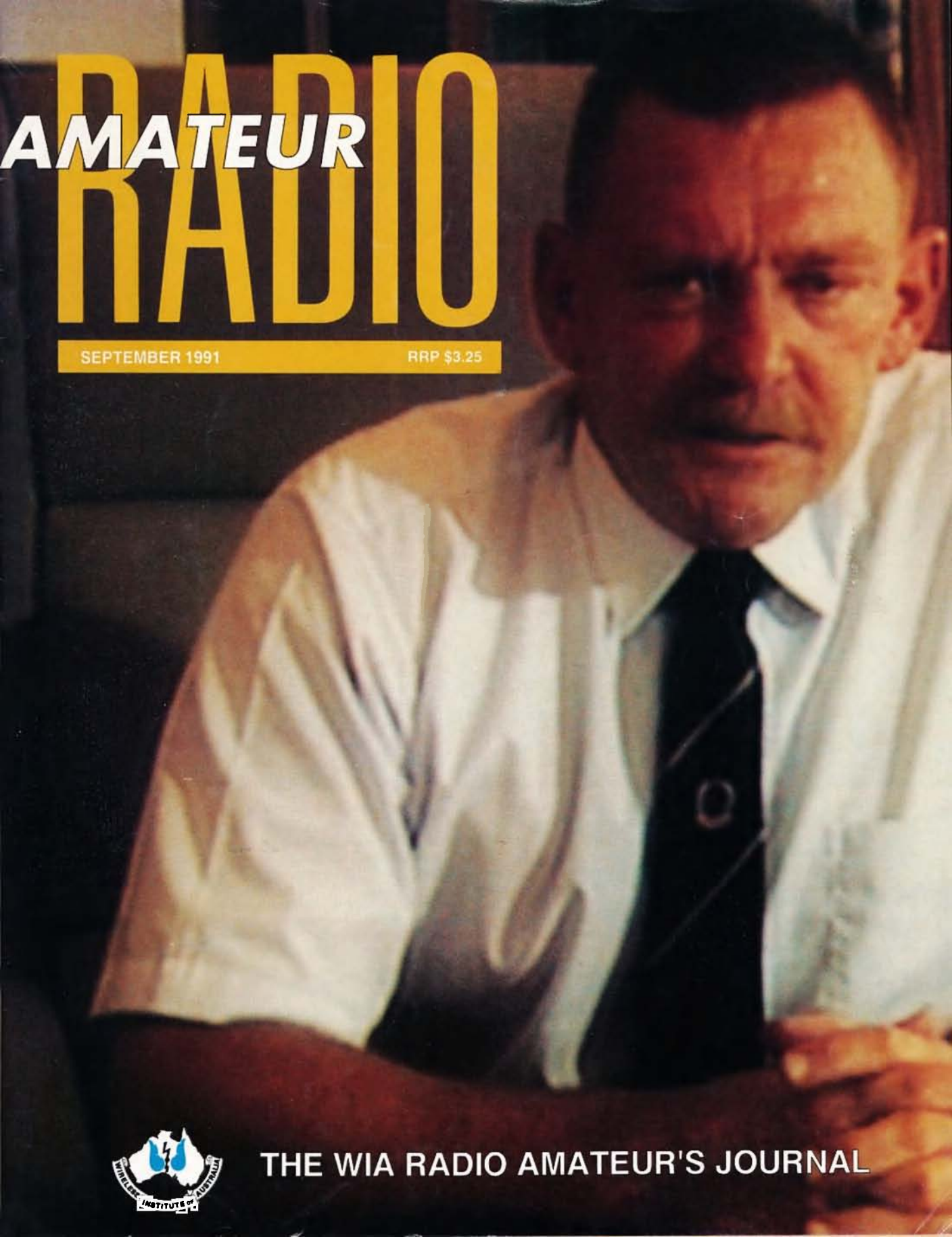

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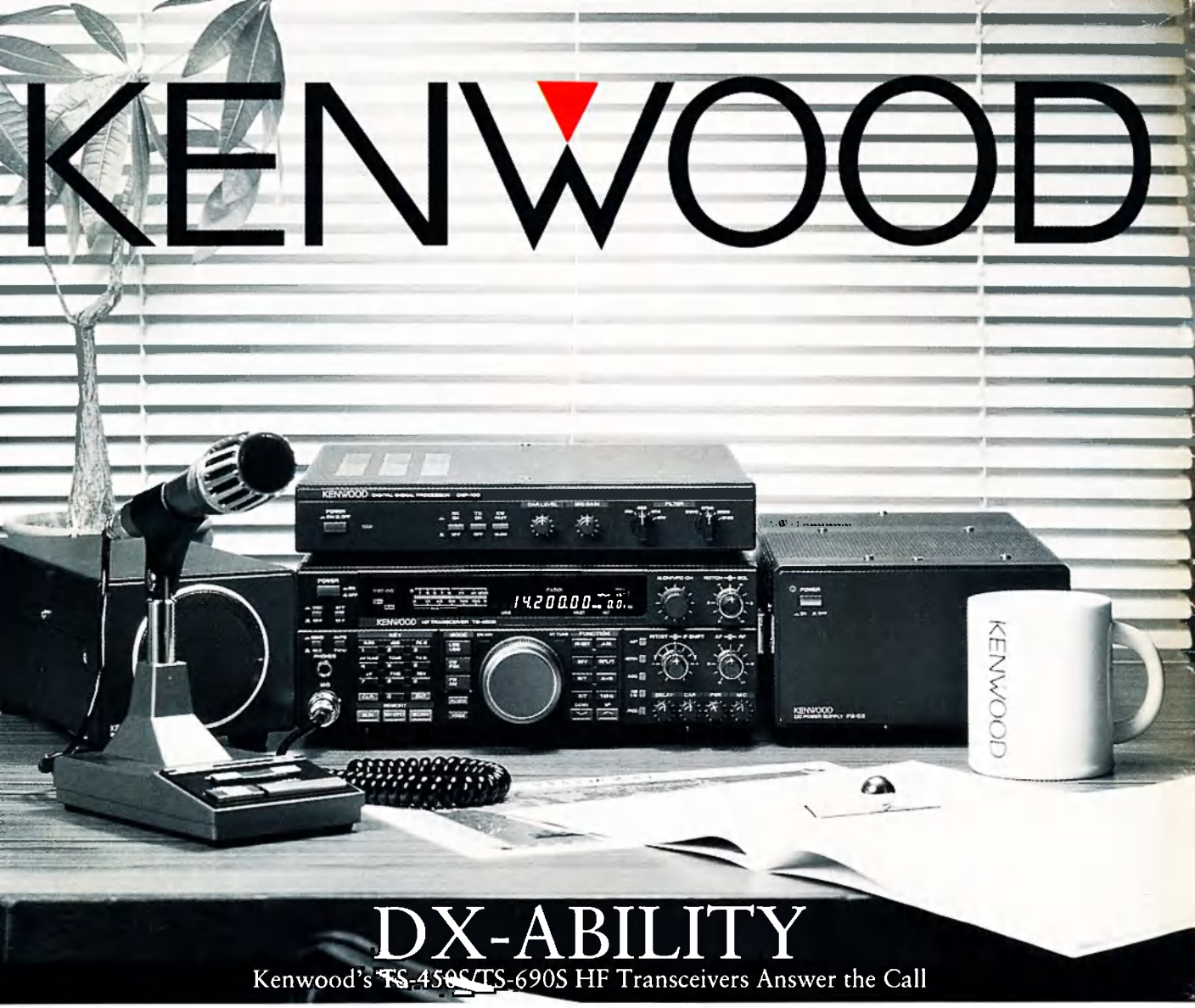

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Evan Jarman VK3ANI
Peter O'Connor VK4KIP
Gil Sones VK3AUI
Phil Steen VK4APA
Roy Watkins VK6XV

DRAFTING
Vicki Griffin VK3BNK

MARKETING
Bruce Kendall VK3WL
Norm Eyres VK3ZEP

ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191
(Non-dedicated line)
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Cover

Major General B W Howard AO MC, Director General NSW Emergency Service. For his RD opening address and profile, please see page 7. Photo by courtesy VK2 Division.

EDITOR'S COMMENT

Bill Rice VK3ABP Executive Editor

Mind Broadening

While Graham Thornton was finishing last month's editorial, my XYL Margaret and I were putting up a tent at the Burke and Wills Roadhouse, halfway between Cloncurry and Burketown in far north-west Queensland. We had left Melbourne on 29 June, driven to Adelaide, and travelled thence by the celebrated "new" Ghan to Alice Springs, arriving 2 July. A magnificent train, indeed, with something like 30 private vehicles on flat-tops at the back. Our Commodore station wagon was one of them.

We left Alice on 5 July and travelled via the Devil's Marbles, Tennant Creek, Barkly Homestead, Mt Isa (three nights), Cloncurry, Burke & Wills, Lawn Hill National Park (three nights), Escott Resort, Burketown, Normanton, Karumba (two nights), back to Cloncurry, thence Longreach, Barcaldine, Blackall, Charleville, Cunnamulla. We were into VK2 and only 76km from Bourke when our elderly engine spat all the teeth from its camshaft drive wheel! We spent a week in Bourke, leaving on 28 July with a reconditioned changeover engine. A night at West Wyalong and we were home in Melbourne on the 29th, with nearly 7000km more on the odometer.

Why have I gone into all this detail? Because I thought you might be interested in the resounding success of amateur communications throughout the journey. Except for the few days when the car was locked in the garage overnight at Bourke, we maintained contact with Ron VK3OM at Upper Beaconsfield twice a day, first after check-in to the Travellers' net at 1230, then every night at 2030 (later 2000). Usually the night QSOs were on 7MHz, as the skip on 14 was too long, and until well south of VK4 our old favourite 80 metres couldn't compete with the QRN! One lesson here was that our "new" (WARC 79) 10.1MHz band would be ideal for round-Australia mobile. Unfortunately, we had no mobile whip for this band. Next time, for sure. The maximum distance between us would have been about 3000km, minimum about 500. Of course we worked many others besides Ron, but he was the most reliable of all at keeping skeds! We met about a dozen amateurs from various places in various places (not necessarily on their home ground). It was interesting to listen to their opinions about the WIA, in person, rather than being inhibited by regulations. One said he knew of at least six in his club who would not join the WIA until So and So was no longer president of the VKx Division. One left the WIA because he felt he had been insulted. Another was strongly convinced that no-one should be allowed to get an amateur licence until s/he was a WIA member. Truly a wide range of opinions! I would like to plead with those of you who do nurse some grievance with the WIA. You may not be able to do much about it as a member, but you can certainly do nothing at all once you've put yourself out! Whether you, one person, belong to the WIA or not may have little effect on amateur radio in Australia. But if you, and we, all thought like that, there would be no WIA, and the effect would be disastrous! The WIA is bigger and far more significant than any one person or group. Stay with it and make your voice heard! We know we're not perfect, but your membership may be just what we need! ar

WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Packet Radio and VK3WIA

If you are a packet radio operator you may have noticed the monthly WIANEWS items that are disseminated from the Executive Office of the WIA through the Bulletin Boards network by VK3WIA. VK3WIA is the callsign of the station operated by the Federal Body of the WIA.

You may also be one of those who has attempted to send a message to VK3WIA and wondered why you never received a response.

The reason is fairly simple. VK3WIA is used only for the outwards dissemination of news relevant to the Amateur Radio Service.

One of the regulations governing the operation of amateur radio stations is that a station shall not be used *"to transmit material relating to industrial, commercial, political, social or religious matters"* (DOC 71, para 9). Unfortunately, almost all messages for the Executive Office relate to items such as changes of address or callsign, missing Amateur Radio magazine, or subscription matters etc., which are all to do with the commercial operations of the WIA. Therefore, they fall under the heading of *"commercial matters"* and are thus outside the amateur service regulations. In fact, it could be argued that any messages for the WIA, except for simple *"greetings"* messages, are strictly commercial in nature.

Like all radio amateurs, the WIA does not wish to operate outside the regulations. Hence, VK3WIA does not accept incoming packet traffic.

The correct vehicles for such communications to the WIA are either the telephone, fax or postal service. These services are generally more reliable anyway.

Contact information for the WIA is detailed on pages two and three of each issue of Amateur Radio magazine. Incidentally, please note that the Executive Office telephone number 523 8191 that for the past two and a half years, has been a shared voice and fax line, is now a dedicated, 24 hours a day, 7 days a week, fax line. The main telephone number of 528 5962 now has two lines.

Quarterly Executive Federal Councillors Meeting

The weekend of 20th and 21st July 1991 saw an extended meeting of the full Executive and Federal Council of the WIA. Councillors attended from each Division, allowing a wide range of topics to be covered that cannot be finalised by the limited number of Melbourne-based Executive at the monthly meetings.

Apart from the regular and important business of finance, correspondence and recruitment, considerable time was

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570 MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2YEL VK2AOE	From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only): 1.845 AM; 3.595 AM morning and SSB evening; 7.146 AM*; 10.125 SSB; On relay 14.160 SSB* and 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; On relay 584.750 ATV sound; 1281.750 FM. Plus automatic relays to 2m repeaters surrounding Sydney and manual to several country repeaters. News headlines by phone (02) 552 5188.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK4ER VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hodland - Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 146.700 at 1900 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

devoted to discussion of the forthcoming change to the examinations system, services provided by the WIA to members, the production of guide-lines for the use of packet radio and for the shutdown of repeaters, and further deregulation of the Amateur Service.

David Wardlaw reported on the status of the WIA preparations for WARC 92. Ron Henderson commented on his reply, on behalf of the WIA, to the House of Representatives discussion paper produced as part of its Inquiry into the Management of the Radio Frequency Spectrum. Ron Henderson also outlined the contents of the papers that have been prepared as the WIA's submissions to the IARU Region III conference in Bandung in October, to which the WIA will send four delegates.

Some time was given to discussion of the WIA objectives for 1992. It was noted that the October weekend meeting will be the time to set the 1992 budget and the Federal component of the membership subscriptions. It was also noted that the current air-fare war has allowed the WIA to save a considerable sum on member transport.

In all, the weekend extended over about 17 hours of formal meeting as well as several hours of informal discussion. A long, hard working and tiring weekend for the WIA Executive and Federal Councillors, particularly those who flew in from the more distant Divisions.

SEANET '91

The Executive Office has recently received brochures about the 1991 SEANET Convention, to be held in Chiang Mai, northern Thailand, from the 8th to 10th November 1991. The brochures contain a registration form and details about the organisation of the Convention. Individual amateurs wishing to receive copies of the brochure should contact the Radio Society of Thailand direct at GPO Box 2008, Bangkok, 10501, Thailand.

IARU
Region III
Conference

At the recent quarterly meeting of Executive and Federal Council, Ron Henderson outlined the contents of the papers that have been prepared as the WIA's submissions to the IARU Region III conference to be held in Bandung in October this year. Here is a brief summary of those papers:

Invitation to host the 1994 Region III meeting in Australia
- Australia will bid if it is deemed appropriate.

Report from the WIA
- a summary of the structure and function of the WIA.

Review and revision of band plans
- a statement of the current WIA band plans.

Use of VHF, UHF, SHF bands in Australia
- recent changes in Australian band plans.

Preparation for WARC 92
- a summary of the WIA activities so far.

The matter of future WARCs
- notes the need to consider the frequency and range of future WARCs.

CCIR
- stressing the importance of the Amateur Service maintaining its position with regard to the CCIR, and the WIA input so far.

Funding of IARU activities
- suggesting a reconsideration of the methods used for funding and monitoring expenses.

Involvement in EMC and CISPR
- a report on Australia's position regarding standards impinging on amateur radio matters.

Promotion and development of Amateur Radio in Region III
- encouraging the formation of sister club relationships and international visits by amateurs

Formulation of callsigns
- the present situation with regard to callsigns for amateurs visiting Australia.

Beacons
- the status of HF, VHF and UHF beacons in Australia.

Relaying of messages by amateurs
- the recent change in the Australian definition of *"Third Party Traffic"*.

It will be seen that, for many of these papers, the intention is to inform the IARU Region III Conference of the present situation in Australia. However, in addition, several submissions have been prepared relating to the management and functioning of the IARU and Conference procedure.

The Conference delegation, consisting of Ron Henderson, George Brzostowski, Roger Harrison and Murray Kelly, is to be congratulated on the range of topics covered and the thoroughness of their preparation for this important Conference.

DL
Callsign
Changes

From the ARRL newsletter comes advice that amateurs from the former East Germany are in the process of having their call signs changed to those with DL prefixes. This will take place over the next few months.

It seems that the ITU has asked Germany to relinquish the Y2 - Y9 call sign block next year, for reallocation to another country.

USA
Amateur Radio
Awareness Day

An Amateur Radio Awareness Day will be held in the USA on 7th September this year. The aim is to make the public more aware of the existence, purposes and benefits of Amateur Radio. American amateurs are being encouraged to set up displays wherever possible.

There may be a few unusual voices on air that day.

New Edition
ARRL
Antenna Book

A news release from the ARRL announces that this popular handbook has been reprinted and will be available in the USA as from August. It includes new projects and information on both new and old antenna types. Arrangements will be made for this new edition to be in the WIA Bookshops as soon as possible.

WARC
History

WARCs are very important to the amateur radio service, and WARC 92 will be no exception. Much is being published about this World Administrative Radio Conference (WARC) to be held in Spain next year. Here, for the benefit of newer radio amateurs, is a summary of the history of WARCs, condensed from an ITU newsletter.

The first international conference was held in Berlin in 1903, was attended by 9 nations, and dealt mainly with standardisation of equipment.

In 1906, 29 nations participated for the purpose of establishing ship-to-shore communications procedures. This conference, also held in Berlin, allocated the first callsigns, specified the use of International Morse, and designated SOS as the distress call.

These regulations were expanded at the 1912 conference of 43 nations in London, which also established the Q code.

In 1927, 78 nations met in Washington. Apart from regulating telephony and broadcasting, this conference officially recognised the Amateur Service and allocated frequency bands to the amateurs. It also established Morse Code ability as a requirement for an amateur licensee.

The Amateur Service was first separately defined at the 1932 Madrid conference, which placed restrictions on international message traffic by amateurs.

The 1938 conference in Cairo faced pressure on HF

band space. It was at this conference that the ITU divided the world into the present Regions 1, 2 and 3.

The first postwar WARC, held in Atlantic City in the USA in 1947, had to find spectrum space for several new services. The amateurs lost some of the 10 and 20 metre bands, but gained at 15 metres and also some new VHF segments.

Little change occurred for the amateur at the 1959 Geneva conference, which signed a set of agreements to govern the operation of the world's radio services for the next 20 years.

Similarly, little affecting the amateur service happened at the 1971 conference, also held in Geneva.

The main gain of recent years was from the 1979 WARC, which resulted in amateurs obtaining three new bands, increasing their status in other bands, and gaining new access for amateur satellites.

Amateur Radio in Beijing

A postcard was recently received from Wally Watkins VK4DO who, with VK4s BRG, KLU and QZ, comprise the Australian team in Beijing to participate in the Radio Direction Finding activities. The group are enjoying themselves exploring the country and sharing amateur radio experiences.

Examiners Alert

Last month we published the News Release about the change in arrangements for amateur examinations. Since then WIA Exam Service has written to all examiners who were on the list received from DoTC.

However, the WIA is coming to understand that this list did not necessarily include all those people who had applied to DoTC to have papers accredited. Therefore, if there are any examiners who have NOT received a letter from the WIA explaining the new system, WIA Exam Service would be very pleased to hear from them.

Federal Awards Manager

It is with regret we announce that Phill Hardstaff, who took on the demanding task of WIA Federal Awards Manager after the untimely death of Ken Gott, has been forced to resign from the position because of the pressure of a new job.

The WIA thanks Phill for the hard work he has put into the position, and wishes him well in his new job. To those members who have been caught up in a backlog while a new Awards Manager was found, we ask your patience and tolerance.

A new Federal Awards Manager has now been appointed. John Kelleher VK3DP, a keen and experienced DXer and awards hunter has been appointed to the position, and Steve Gregory VK3OT, will assist John by handling claims for DXCC and WAS (VHF) and WAVKCA (VHF).

Both John and Steve expect to have the backlog of awards claims cleared in a very short time.

Stolen Equipment Register

There have been two large thefts of amateur radio equipment in the past two weeks, one in Melbourne, the other in Sydney.

In both cases details have been provided to the WIA and have been entered into the WIA Stolen Equipment register. This register is maintained by the WIA but is available for the benefit of all radio amateurs in Australia.

One small example of the effectiveness of the Stolen Equipment Register occurred early in August. Police in Queensland had recovered, in a drug related raid, an amateur transceiver which had been stolen several months previously. The serial number on the transceiver had been removed but the police telephoned the Executive Office of the WIA to see if we could help identify the rightful owner of the transceiver.

Fortunately the owner had reported the details of the theft to the WIA Stolen Equipment Register. Within seconds we were able to advise the police of the likely owner of the equipment.

The owner contacted the Executive Office a few days later to let us know what had happened and say that, as soon as the court case is finished, he will have his stolen rig returned to him.

If you are unfortunate enough to have amateur radio equipment stolen, please let us know the full details (of course, you have a list put aside of the serial numbers of all your equipment, haven't you?). Also, if you are suspicious that the "red hot" bargain transceiver you are about to buy might be "hot", give the Executive Office staff a call and get them to check if it happens to be on the Stolen Equipment Register.

Packet Radio and IARU Conference

Recent WIANEWS items on WIA contributions to the coming IARU Region III Conference in Bandung next October said packet radio would be the subject of a conference paper. In preparing that paper the WIA has drawn heavily upon information arising from a *"Way Ahead for Packet Radio Symposium"* held in Canberra recently. Incidentally, packet operators from five of the seven Australian states were present at those discussions. A draft of some Bulletin Board System (BBS) operators guidelines, put together at the symposium, was also circulated to prominent BBS operators in all states, to WIA Federal Councillors and to Divisional Technical committees in a bid to obtain inputs. Comments were also invited on band plans, protocols and operating procedures.

The WIA is pleased with the effort some recipients took to respond with well argued views. This has allowed a paper to be drawn up which truly represents the views of Australian packet practitioners out there in the field. The bottom line was, in effect, "steady as she goes" and use commonsense when operating on packet.

The WIA wishes to express its sincere thanks to the following who contributed:-

VKs 1KCM, 2EHQ, 2XY, 3AVE, Canberra Amateur Packet Radio Group, Australian Amateur Packet Radio Association & South Australian Packet Users Group. Grateful thanks are also due to Kevin VK1OK, who drew it all together and drafted the following paper for clearance by Executive.

Packet Radio Regulations and Operations

A paper from the Wireless Institute of Australia for presentation at the eighth IARU Region III Conference, Bandung, October 1991.

Background

The period since the last IARU Region III Conference in 1988 has seen a steady growth in packet radio activity in Australia. This paper covers significant Australian packet radio developments arising since that time.

Band Plans

Australian Packet Radio operation has generally conformed to the Band Plans developed at the last IARU Region III Conference in 1988. The experience of Australian operators is that the data sub-bands are working well. The reasons for separating packet radio and other data modes are as valid now as when the plans were developed.

The 14 MHz sub-band allocation for data communications has operated well after an initial bedding in period. While this plan is at variance with those of Regions I and II, observations by Australian operators show that packet radio stations from all regions regularly operate in this sub-band. The frequency of 14.107

MHz is much favoured for both national and international BBS forwarding in all Regions.

With the increasing availability of the 10, 18 and 24 MHz bands, the BBS traffic load has been spread across all available bands, but 14 MHz is still the most reliable band for national and international working. The subband upper limit of 14.112 MHz should be retained.

Protocols and Regulation

Packet Radio development is still very much in the experimental stage, especially in the area of networking. Domestically, Australian packet radio operators have been hampered by overly restrictive identification requirements that have hindered the development of packet radio networks across the country.

The WIA has continued to emphasise the open experimental nature of the mode and in conjunction with the packet community is developing a proposal for submission to DOTC for more relaxed regulatory requirements which will better allow the mode to develop.

Under the framework being developed, the Network becomes an entity in its own right, whose internal traffic and methods of routing are not of consequence to operators accessing the network.

The WIA does not see a need for any restrictions on protocols, an approach which has been borne out over time. Rather, the WIA feels that "standards" will tend to emerge naturally if they are seen by the practitioners of the mode as being useful.

Such "standards" will be adopted until developments require the adoption of a different "standard".

Bulletin Board Systems (BBS)

Bulletin Board Systems continue to play an important role in the packet radio scene. Most BBS Sysops are dedicated, hard working people, providing a service to their fellow packet radio users.

In conjunction with the packet community, the WIA has recently developed a set of guidelines for BBS Sysops. These guidelines which have been widely publicised among the BBS Sysops are not seen as being static, but subject to revision to reflect current procedures and practices.

A copy of these guidelines is attached for the information of member societies.

Summary

Packet Radio continues to develop in Australia under the guidance provided by the IARU Region III Conference in 1988. That guidance is still relevant and no need is seen for change at this time.

Attachment A: Guidelines for packet bulletin board operators.

Service Level

When an individual or group decides to establish a Bulletin Board, its Service Level must also be established and publicised. The Service Level is a description of what services will be provided.

As part of the service definition, the Service Area of the BBS should also be defined. This is a description of what area the BBS will service and would normally define from where the BBS would accept users who use the BBS as its home BBS, and where the BBS would forward to PMS systems if these are supported.

Beaconing

A BBS should beacon regularly only within its service area and the period should not be shorter than one beacon every 30 minutes.

Software

The software to be used is the choice of the BBS operator. If the BBS is to interface to the mail forwarding network, then the software should support, at a minimum, BIDS and Hierarchical forwarding.

Users

Users should be treated courteously. Likewise, Users should treat Sysops courteously. Excluding a user from a BBS should only be done in extreme circumstances.

Mail Forwarding

Where the mail forwarding is conducted on user frequencies, it should be restricted to non-peak times or other times to minimise the intrusion on the normal operation of non BBS traffic. If forwarding takes place on dedicated frequencies, then no restrictions apply.

Message Sizes

Where a message may be routed via HF, the message should be restricted to 3 KBytes in length. For more reliable paths, longer messages may be used, but keeping messages reasonably small is a desirable aim.

Number of Bulletin Boards in an Area

As a general rule of thumb, for a general mail handling Bulletin Board, each operational port can support up to about 200 casual users, with a lesser number of regular users. If there are less than about 25 regular users, then there is probably insufficient justification for another general BBS. In areas with a high number of users, more than 1 BBS may be required.

Special purpose BBS should be considered separately. The Service Level of a special purpose BBS should not overlap to any significant extent with that of an existing general purpose BBS. A separate frequency for a special purpose BBS should be chosen where possible.

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1991 Remembrance Day Opening Address

MAJOR GENERAL B W HOWARD AO MC

I AM MOST PLEASED TO launch the 1991 Remembrance Day Contest for the Wireless Institute of Australia, and I note with interest the most distinguished persons who have done so in the past. While I could not personally compare with many of them, I am only too well aware of the part played by communications in peace and war.

That your Institute is still so active is a tribute to the dedication of so many volunteer operators who maintain their skills at a time when it becomes more difficult and expensive to do so, and I congratulate you all for that.

But why, some may ask, bother to do so when we have been at peace for so long, and there are indications, fortunately, that this state of things will prevail. As one who is totally involved in managing emergencies, the answer is only too obvious. We need you!

When I took up the appointment of Director General of the State Emergency Service of New South Wales, I was disappointed that many of the organisations which had something to contribute were not properly integrated into our emergency management system.

In all but one of the major emergencies which I became personally involved in, including the Newcastle earthquake, which I am sure you will all remember, normal means of communication were lost. I am sure that this is not a new phenomenon. Yet, at that time, not all the emergency services were aware what the volunteers of the Wireless Institute could do. I am working to ensure that all agencies are properly integrated into an emergency management system, and I urge all of you who are listening today to make sure that your capability to assist during an emergency is known by the right people.

So I take the opportunity of your Remembrance Day Contest to ask you to become involved for it does not really matter whether the emergency we face is from an armed enemy or from a natural disaster, the need for communications remains the same.

But, your skills will be wasted if your capacity to provide communications is not known by the emergency services, and used by them as a matter of course.

In conclusion, let us now turn our minds back, and remember those in whose honour this contest is being conducted, and has been for the past 40-odd years. Their efforts contributed in no small way to the good things of life we have today.

In particular, our freedom, for which we should be everlastingly grateful, and mindful of the fact that, without them, we might not have it at all. Thank you all very much for allowing me to share in your Remembrance Day Contest, and my best wishes to you all.

I now have pleasure in inviting all those listening to take part in the 1991 Wireless Institute of Australia Remembrance Day Contest.

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Major General B W Howard, AO, MC
Director General, State Emergency Service

Major General Brian William Howard was born in Sydney on 23 March 1938, and educated at St Pius X College, Chatswood. Graduating from the Royal Military College, Duntroon, in December 1959, he served in regimental appointments in both 3rd Battalion, the Royal Australian Regiment and the Pacific Islands Regiment before being posted on exchange duties with the 3rd United States Marine Division Okinawa and South East Asia in December, 1963.

He served as an instructor at the Royal Military College, Duntroon, from 1965 to 1967 before returning to 3rd Battalion, the Royal Australian Regiment as a Company Commander, in October 1967. He served with the Battalion in South Vietnam in 1967/68 and was awarded the Military Cross during that service.

In 1969, Major General Howard was posted to the 1st Battalion, Pacific Islands Regiment, as a Company Commander. He returned to Australia in early 1972, before attending the Canadian Staff college in 1972/73. He assumed duties as a Staff Officer in Operations Branch, Army Office in 1973, and later as a Staff Officer in the Directorate of Infantry.

In January 1976 he assumed command of 3rd Battalion, the Royal Australian Regiment, and remained in that posting until attending the Joint Service Staff College in 1978. In September 1978 he was posted as an Exchange Instructor to the United Kingdom Staff College at Camberley. This posting is a significant achievement for any officer and is highly sought after. He was admitted into the Order of Australia in January 1979 as a member, in recognition of his service as Commanding Officer of 3rd Battalion, the Royal Australian Regiment. He returned to Australia in late 1980 and was posted as a Senior Staff Officer in the Directorate of Operations and Plans (Army Office).

He assumed the appointment of Director of Infantry and Regimental Colonel of the Royal Australian Regiment on promotion to Colonel in April 1981.

In May 1983 he was promoted to Brigadier when he assumed command of the 6th Brigade in Brisbane. On completion he was appointed as Director General Operations and Plans. He was promoted to Major General on 27 January 1987, and appointed as Director General, Natural Disasters Organisation, on 27 February 1987.

In May 1987 he was appointed by the United Nations Disaster Relief Co-ordinator (UNDRO) to an international panel of disaster management experts, which meets annually in Geneva to select the recipient of the SASAKAWA-UNDRO Disaster Prevention award. In 1988 he made official visits to the United States Federal Emergency Management Agency, Emergency Preparedness Canada and New Zealand Civil Defence. In April 1989 he was appointed by the Prime Minister to co-ordinate Australia's contribution to the International Decade for Natural Disaster Reduction.

Major General Howard was appointed Director General of the New South Wales State Emergency Service on 18 December 1989.

Major General Howard and his wife Carmen (nee Mills) were married in 1966 and have two children. ar

WIA Exam Service

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445
BLACKBURN 3130

THIS MONTH I AM TAKING a slightly higher profile than my notes usually do. I want to discuss the changes in the examination system, and that is something that concerns all amateurs, not just the ones with an interest in education.

Bill Roper, VK3ARZ, announced last month in WIA News and on the Federal Tapes, that arrangements have been made for the Federal Office of the WIA to assume the responsibility for producing and providing examination materials to all who require them throughout Australia. Perhaps a little of the history is in order.

Many readers will remember that there were lengthy discussions in 1987-8 about DoTC's proposals for the devolvement of amateur examinations, on the grounds that the costs of the examinations were out of proportion to the sums recovered from candidates. The WIA agreed that for DoTC to attempt to cover costs by raising the examination fees was not a good idea, and was likely to result in excessive charges to candidates. After deliberations and wide discussion, the WIA position was elaborated in a submission to DoTC which stated that the preferred options, as seen by the WIA were, in order of preference, firstly, for DoTC to continue to administer the examinations; secondly, for DoTC to provide prepared materials for the WIA to administer; and, as third preference, for the WIA to administer the whole examination system for all of Australia. (This third system had been proposed to the WIA by DoTC in 1984,and discussed at Executive and Joint Meeting level. However, negotiations had lapsed when the DoTC Central Office was moved to Canberra in 1985). In all dealings, the main consideration of the WIA, and a large number of other bodies which provided comment, was that the standard of the examinations should not be lowered.

The system of devolvement which finally emerged, with the wide release of the question banks and the vast number of examiners, was not at any stage considered, proposed or approved by the WIA. Nevertheless, several WIA divisions, clubs and a number of individuals took up the challenge and worked within the DoTC framework to make examinations available to most of those who required them. Some of these examiners have done an excellent job, and deserve the thanks of all amateurs for the time and effort contributed.

I do not need to tell those who have been preparing examination materials that the system rapidly became cumbersome and frustrating. As with most other government departments, DoTC suffered curtailment of resources, and the Amateur Service, one of its smallest areas of responsibility, was requiring more and more time for accreditation of materials. So it was not surprising that further changes began to be considered.

The WIA is in continual contact with DoTC on a wide range of topics affecting the Amateur Service. When it became apparent that a further change to the examination system was impending, and that one of the possible changes was to an even wider range of examiners with less control by DoTC, discussion commenced on the possibility of the WIA assuming the responsibility for the administration of the whole examination scheme.

Extensive negotiations over a fairly tight time schedule resulted in the WIA Executive agreeing to accept the responsibility of preparing and providing examination materials and results information for all Australian candidates. The terms and conditions of the agreement were finalised in mid-July.

This extra task will add considerably to the workload of the Executive Office, which will be responsible for managing the system. But it relieves the individual examiners of the load of preparing examination materials and having them accredited. Instead, they will be supplied with the required examination elements ready for use within a few days of a request being received. It also means that there will be one uniform standard for materials throughout Australia, and so equal opportunity for all candidates.

The role of the local examiners, however, remains as important as ever. They are the people who have direct contact with the candidates, and who therefore have considerable influence over how the candidates perceive the examination process and amateur radio in general. They will be responsible for the security of the materials, arranging the time, venue and comfort of the examination session, checking candidate identity and providing a preliminary pass/fail assessment. If they wish, they may also provide failed candidates with a report on the reasons for failure. (Arrangements will also be made for supply of a paper evaluation from the office if the examiner cannot supply it).

Because of the advice available from current experienced examiners, it has probably been easier to plan a revised system than it would have been to organise it completely from scratch if the original WIA third option had been accepted. The aim throughout has been to ensure that candidates are in no way disadvantaged by the new system. As far as possible, the new protocol has built on the strengths of the original devolved system and, hopefully, avoided most of the pitfalls. So, since many examiners were notifying candidates of their results on the same day as the exam, provision has been made for examiners to mark papers and provide provisional pass/fail results immediately after the examination. Because of the agreement with DoTC, results must be confirmed from the Executive Office on a form which will be the basis for the issue of the Certificate of Proficiency and, subsequently, the licence.

The cost of examinations has always been a sensitive issue. Many readers will remember the outcry when DoTC raised its examination fees from the time-honoured $2.00 to a more realistic figure. The WIA is aware that many dedicated amateurs have been providing examinations at minimal cost by virtue of considerable volunteer effort (and perhaps by the use of the boss's photocopier). This has been great for the candidates, but unfortunately the WIA does not have a continuing committed supply of free volunteer labour, or "free" photocopying. Members must be assured that the examination section will not be subsidised out of members' subscriptions, and will not be a drain on the financial resources of either the Federal body or the Divisions. It was therefore decided that the examination section should be run as a separate entity, with a separate budget, on a cost-recovery basis. Estimates based on expected candidate numbers and on pro-

jected costs per candidate are that the charges for each examination element will be set only slightly above the figures that were being charged by DoTC before devolvement, and will remain at that figure for at least a year.

So how does it all happen? The proposed system was outlined in WIANEWS last month. Letters have gone from the WIA to all current examiners, whether WIA or not, explaining the changes and inviting them to continue as examiners in the new system. If there are any current examiners who have not received this letter from the WIA, please let the Executive Office know at once of your existence, so your name can be included in future information releases. The names were taken from a list supplied by DoTC, but it is known that there were some omissions. "WIA Exam Service" at the Executive Office will begin to accept applications for accreditation as examiners very shortly, and it is intended that examination materials will be available as from 1 October. Enquiries about the administration of the examinations should go to the General Manager, WIA Executive Office. Further details will appear in WIANEWS and in letters to examiners as necessary.

I will not be involved in the examination administration, or the preparation or supply of materials or results. As Education Co-ordinator, however, I will still be taking an active part in the work of extending the question banks and revision of the syllabuses which I mentioned last month. I offer the new system my wholehearted support, and am convinced that it has the potential to provide at last all those benefits we sought so actively over the years. It promises easy access, negotiable time and location, equality of opportunity and a maintained standard while still being under the control of the Amateur Service. I am very pleased that the changes have at last gone this way, and look forward to watching "WIA Exam Service" develop and grow.

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The Merits of Open Wire Lines

LLOYD BUTLER VK5BR
18 OTTAWA AVE
PANORAMA 5041

Introduction

IN CHOOSING A FEEDER SYSTEM for antennas, preference is often give to the use of 50-ohm coaxial cable. This practice is often applied when, in fact, it might be more efficient, or even more convenient, to use balanced open wire lines. This article is devoted to pointing out the advantages of open wire lines and discussing a few particular applications where they might be the preferred choice to feed the antenna.

Coaxial Cable

Before turning to our open wire line discussion, we should first discuss the merits of coaxial cable, in particular the type with polythene dielectric as generally used in amateur radio. Typical values of characteristic impedance for this type of cable are 50 ohms and 75 ohms, very suitable values to match the radiation resistance of many basic antennas. Because of the concentric form of the two cable conductors, the coaxial cable fields are confined to within the inside of the cable bounded by the outer conductor. As there is little field on the outside of the outer conductor, the cable can be mounted directly on a metal support. Owing to this feature and also the flexible nature of the polythene dielectric, the cable is very suitable for running up the side of a metal tower or mast to the antenna on top. Furthermore, radiation directly from the cable is minimised because of the confined field. From a receiving point of view, the cable forms a transmission line which is shielded from direct signal pick-up. This is an advantage if the cable must run through a high level field of localised noise.

Attenuation

Figure 1, reproduced from the *ARRL Antenna Handbook,* compares the attenuation of various types of transmission line. Coaxial cable type RG8 is commonly used to feed an antenna on a rigid structure such as a tower. From the curves, RG8 has an attenuation of 0.8dB per 100ft at 14MHz and 1.2dB per 100ft at 29MHz. This is clearly a very satisfactory cable for HF work but, being a 0.4-inch diameter cable, it is somewhat bulky to hang in free space from the average amateur wire antenna For the wire antenna, we might choose a lighter 0.2-inch

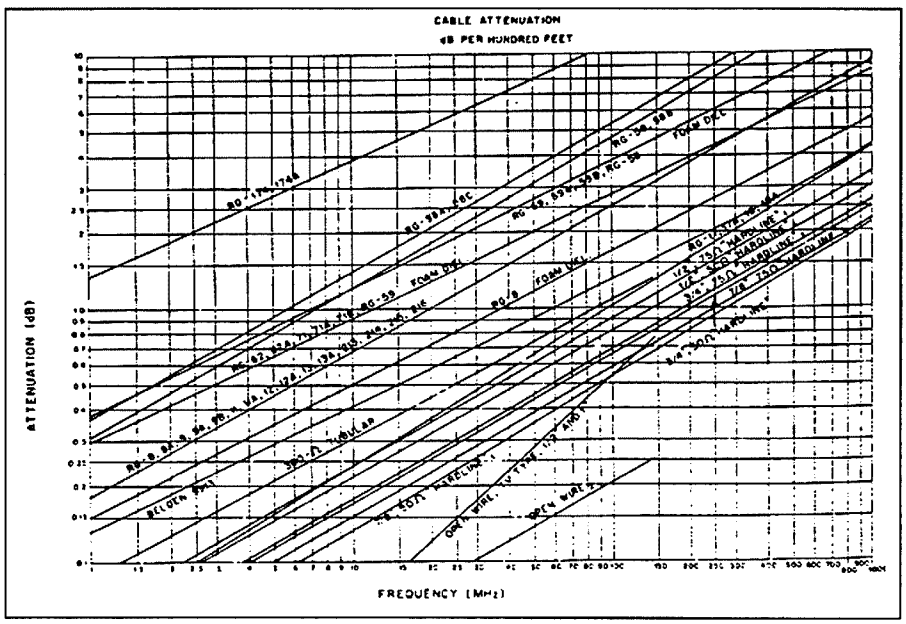

Figure 1. Attenuation of various types of transmission line (reproduced from the ARRL Antenna Handbook).

diameter cable. Suppose we were to feed a dipole antenna set at a height of half a wavelength above the ground. The radiation resistance at this height could be assumed to be 73 ohms and a 75 ohm 0.2-inch cable, such as RG59, could be used to match the antenna through a 1:1 balun transformer at the antenna centre. Referring again to the curves, this cable (RG59) has an attenuation of 1.5dB per 100ft at 14MHz and 2dB per 100ft at 28MHz.

All the attenuation figures we have quoted assume a standing wave ratio (SWR) of 1:1. We now refer to figure 2 which allows us to derive the attenuation for SWR greater than 1:1. If our SWR is 3:1, we see that the attenuation of the RG59 cable has increased to 2dB/100ft at 14MHz and 2.8dB/100ft at 28MHz, quite an appreciable loss. Instead of using RG8, we could use 300 ohm open wire TV line via a 4:1 impedance ratio balun transformer. This cable is quite light and flexible, and hangs very well from a wire antenna From figure 1, its attenuation for an SWR of 1:1 is around 0.08dB/100ft at 14MHz and 0.17dB/100ft at 28MHz. We again refer to figure 2 and it becomes clear that, for an SWR of 3.1, attenuation of the open wire line is still only a fraction of a dB/100ft at both frequencies and, hence, far more efficient than the coaxial RG59 cable.

Tuned Feeders

The operation of wire antennas multi-band is often made a lot easier if the transmission line can be tuned. This of course implies a very high SWR. Suppose we select a value of SWR = 20, the highest value shown on the curves of figure 2. For this SWR, our RG59 coaxial cable has an attenuation of 6dB/100ft at 14MHz and 7.5dB/100ft at 28MHz. This is excessive attenuation and hence the coax cable is hardly suitable for operation in a tuned feeder mode.

We now apply the SWR = 20 to the open wire TV cable and we get attenuation figures of around 0.8dB/100ft at 14MHz and J.4dB/100ft at 28MHz. Quite clearly, open wire line is essential for good power efficiency when using tuned feeders.

Some Typical Wire Antennas

One of the most popular of multi-band wire antennas is the G5RV. A typical form of this antenna makes use of a 75 ohm twin lead or coaxial cable coupled via a matching stub of 300 ohm ribbon (refer figure 3). Whilst a good SWR is

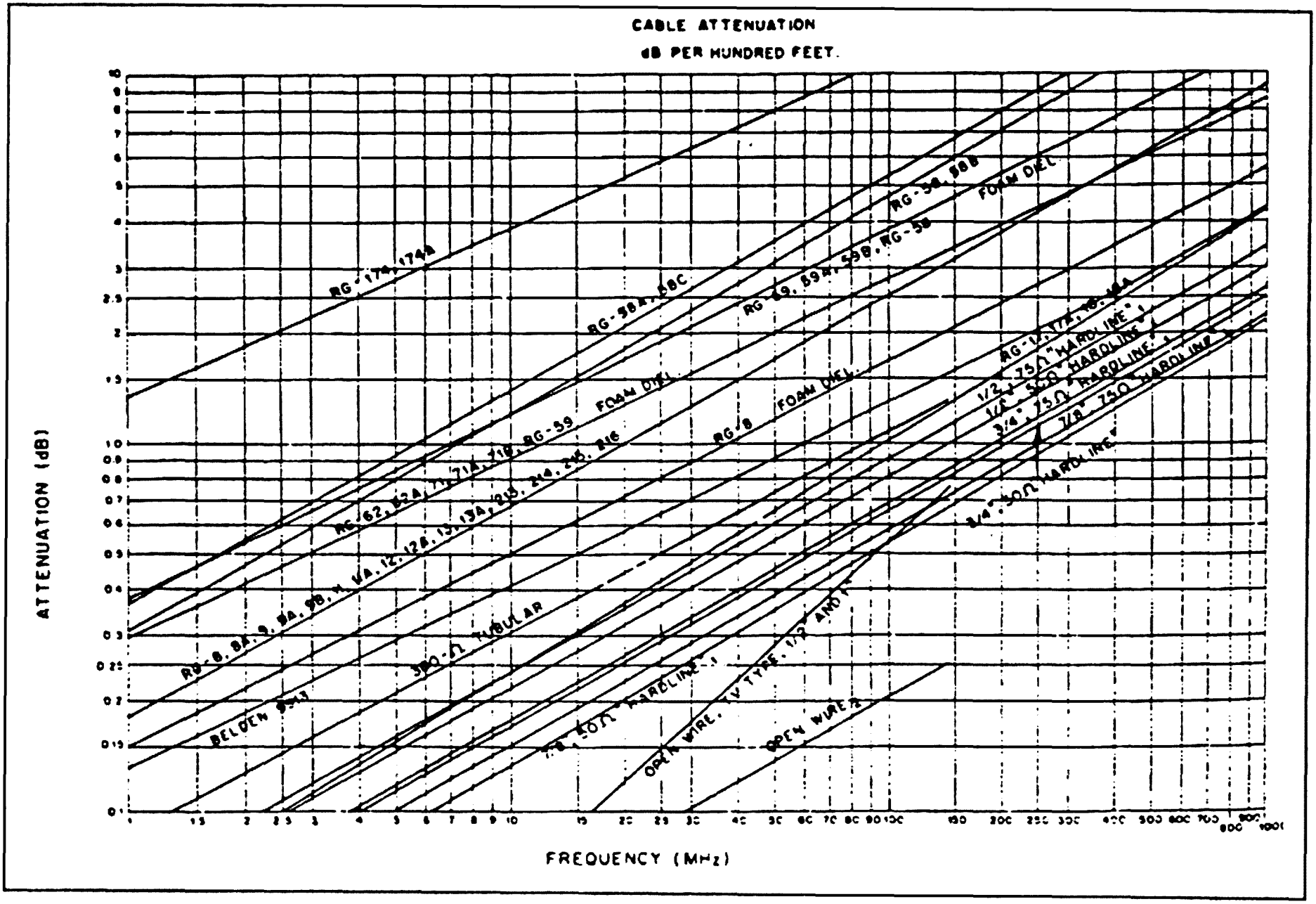

Figure 1. Attenuation of various types of transmission line (reproduced from the ARRL Antenna Handbook).

achieved at 14MHz, it is reported to be as high as 6:1 at 7MHz and 21MHz and 4:1 at 28MHz (refer VK3AVO, *AR* April 1974 and December 1982). The alternative arrangement is to use 83ft of open wire line all the way to the centre of the antenna. Using this type of feed system, the attenuation is negligible for whatever SWR applies and, hence, it is the preferred system.

Considerable attention has recently been given in "Random Radiators" to various forms of the series fed or "Carolina" Windom antenna. A typical form of this antenna is shown in figure 4. An antenna impedance of around 200 to 300 ohms is assumed and this is coupled via a 4:1 or 6:1 impedance ratio balun transformer at the antenna connecting point. Of course, the balun transformer must be fitted in some sort of weatherproofing housing attached to the antenna in space Would it not be better to feed the antenna with 300 ohm TV open wire line (or similar) and fit the balun transformer in the radio shack? Not only would the transmission line have lower power loss, but a weatherproof fitting for the transformer would no longer be required

End Fed Horizontal Antennas

If the radio shack is nearer to one end of the wire antenna than its centre, it is often more convenient to end feed the antenna with a shorter length of feed line. The end of the antenna is a high impedance in the order of thousands of ohms, the actual value being dependent on the wire size and the number of half wavelengths along the wire. One method of matching this impedance to the lower impedance of a balanced transmission line is to tap in the line connection at the appropriate point on a quarter wave matching stub. (See figure 5). This is an efficient feed system but it is limited to single band operation.

For multi -band operation of the end fed antenna, the open wire line is fed directly to the antenna end and operated In a tuned mode. The transmitter is interfaced with the line via a tuner with balanced output (refer figure 6). The end fed antenna has some different characteristics to its centre fed counterpart. At a frequency for which the antenna is one half wavelength long, the radiation pattern is similar. However, this is not so at higher multiples of a half wavelength. Take the case of the second harmonic operation in which the wire is one wavelength long. For the centre fed antenna, the two half waves are in phase, but for the end fed antenna, they are out of phase. The centre fed antenna concentrates its field in a bi-directional pattern whereas the end fed antenna has

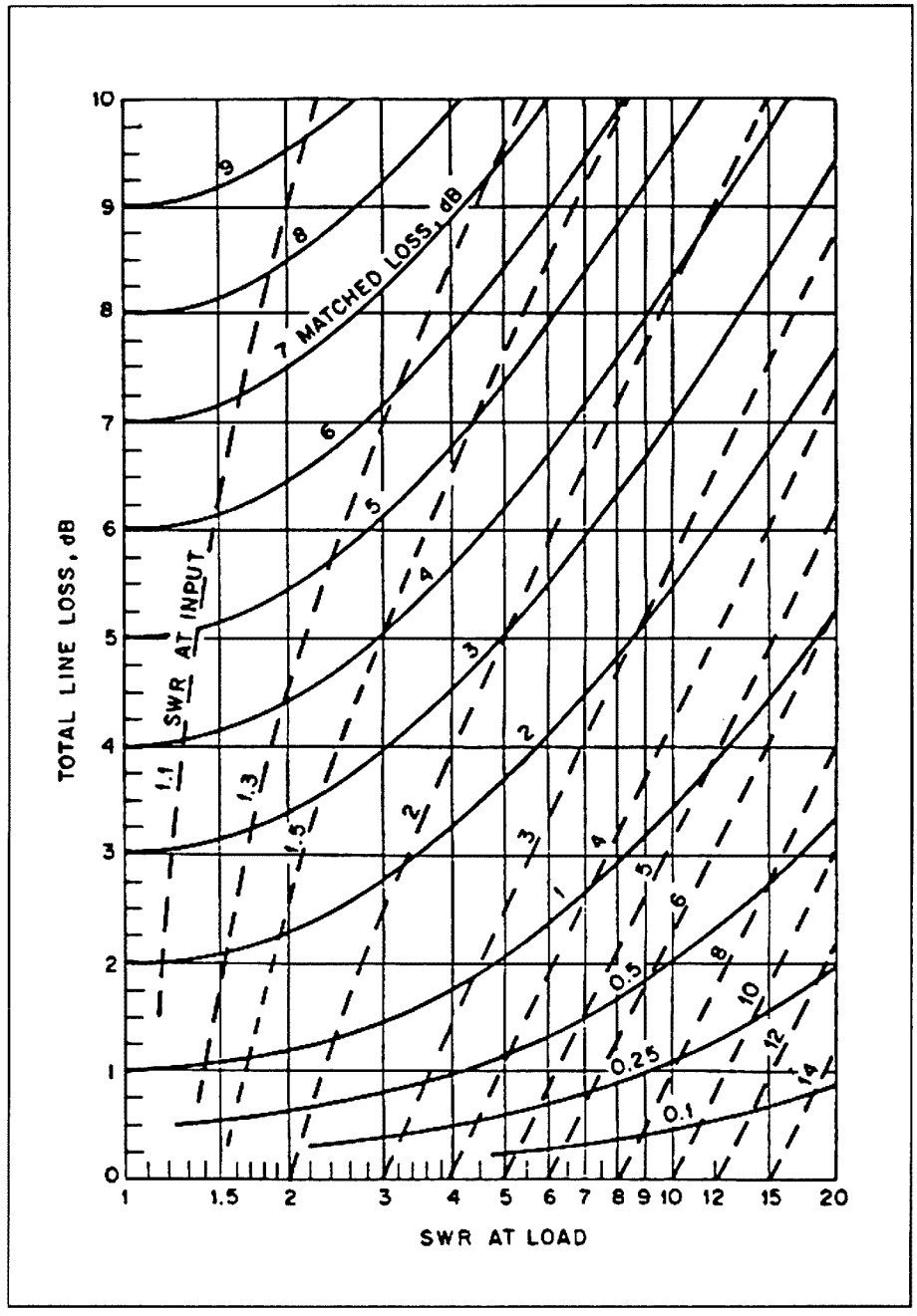

Figure 2. Curves show increased attenuation in a transmission line when the SWR is increased (reproduced from the ARRL Antenna Handbook).

four main lobes giving a more omni-directional pattern.

An interesting version of the end fed antenna is the end fed inverted V. Assuming this is cut for a half wavelength on 40 metres, it operates similarly to the centre fed inverted V on that band. On 20 metres, there are two half-wave sections as in the horizontal wire but the fields are around 90 degrees to each other (assuming a 90 degree V). In the horizontal plane, the fields are out of phase, but in the vertical plane, they are in phase and additive. It seems reasonable to assume that, on 20 metres, this antenna operates more like a vertical antenna with two broadside elements and a consequent low angle of radiation. The antenna can also be operated as three half waves on 15 metres and four half waves on 10 metres with even more complex radiation patterns. Such an antenna system has been described by Colin Dickman in "Radio ZS" as the "ZS6U Minishack Special". The articles concerned were also reprinted In *QST* and *Amateur Radio*.

The end fed inverted V has been used as a multi-band antenna at the writer's

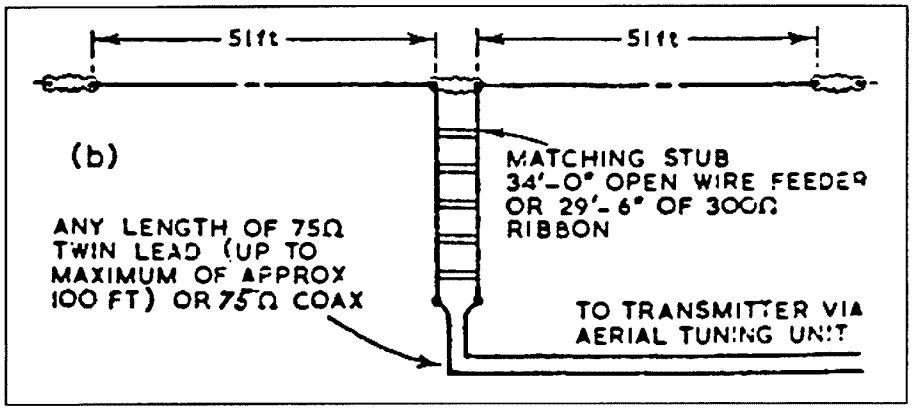

Figure 3. The G5RV antenna with 75 ohm transmission line.

home for many years and with considerable success. In this case on 20 metres, the open wire line is matched to the end of the antenna using the quarter wave matching stub. The shorting clip for the stub is just outside the radio shack door and on 40, 15 and 10 metres, the short is removed and the twin open wire line and part of the stub all become the tuned line used on these bands. On 80 metres, the feeder wires are paralleled and the antenna plus feeder and stub become a Marconi antenna operated against ground radials. On this band the radiator is a little over a quarter wave long.

Lengths of Tuned Lines

Tuned lines can be any length provided the antenna tuning system can cope with the impedance reflected down the line. Taking the example of the end fed antenna, odd multiples of a quarter wave will reflect very low impedance and even multiples very high impedance. Both these extreme conditions might present difficulties for the antenna tuning unit and line lengths which are multiples of a quarter wave should perhaps be avoided.

Open Wire Line at VHF

Most custom built VHF antennas are made to match directly into a 50 ohm coaxial cable and, generally speaking, feeding the antenna via a coaxial cable is the most convenient thing to do. Commonly used types of 50 ohm coaxial cable are RG58 and RG8. On two metres, RG58 has an attenuation factor of 4.5dB/100ft and RG8 has a factor of 3dB/100ft. If the transmission line is long, one might well consider open wire line as an alternative to the coax cable. The 300 ohm TV open wire line has an attenuation factor on two metres of only 0.75dB/100ft.

An antenna in common use is the 10-element channel 5A TV Yagi which has been modified for 2m operation. The active element in this antenna is a folded dipole which presents a terminal impedance of around 300 ohms, specifically designed for 300 ohm ribbon cable or 300 ohm open wire line. Here is a case where the 300 ohm line can be run all the way to the antenna from the radio shack with lower loss than using the coaxial cable. At the transmitter end, a 75-300 ohm coaxial balun (as shown in figure 7) can be used to interface with the transmitter The 75 ohm load to the transmitter might be a little high for the usual 50 ohm-output but in practice it can work quite well

Another antenna which is easily matched to the open wire line is the J antenna, figure 8. A half wave vertical radiator is connected at its lower end to a quarter wave matching stub. The open wire line is simply connected to the stub at an impedance point matching the line impedance. The position of the connecting taps can be set by experiment for minimum SWR on the transmission line

For a horizontal half wave VHF antenna, one might choose to couple from the open wire line via a delta match as shown in figure 9. This is also a common method of coupling to a HF wire dipole, which is operated only on its fundamental frequency.

Whilst the open wire TV line provides an ideal low-loss feed system, there is one disadvantage When it rains, globules of water collect on the bridges which spread the wires and this changes the characteristics of the line. On HF, the water appears to have little effect but, on VHF, the SWR increases quite dramatically. When the rain stops, the water globules can can be shaken from the line with a blow from a broom handle or similar

Once this is done, the SWR returns to normal.

Procurement & Construction

We have given considerable attention

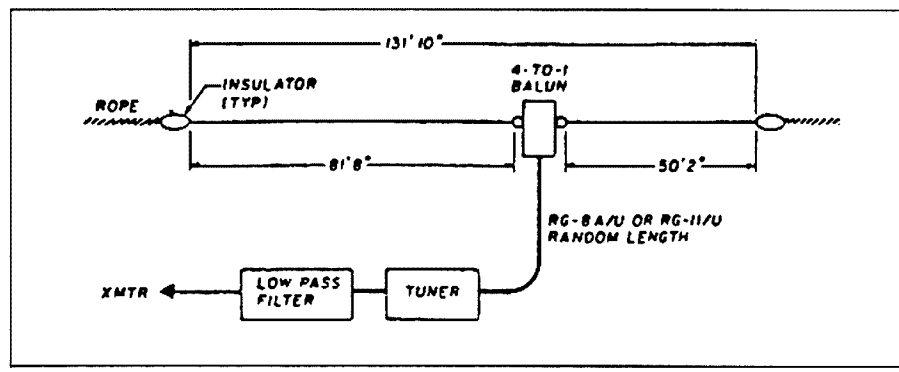

Figure 4. The Carolina series fed Windom antenna using coaxial transmission line.

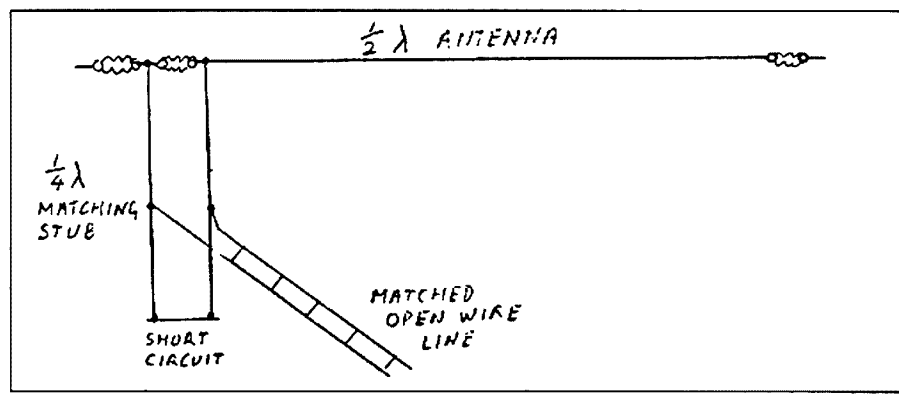

Figure 5. End fed half-wave antenna fed with open wire line and matched using a quarter-wave stub.

to the 300 ohm open wire TV line. This line or cable is made up of two insulated 18SWG single strand conductors spaced one half inch (12.7mm) apart. Insulating spacers are moulded around the conductors at intervals of around 12 to 15 cm along the cable. The cable is light and flexible and ideal to hang in space supported at one end by the wire antenna. In the past, the cable has been available from outlets which handle TV antenna components and installation, but of recent years, the supply has dried up. If anyone has information concerning whether it is still available (perhaps from overseas) we would be interested to be informed. Perhaps procurement could be taken up by one of our electronic component suppliers.

Failing supply of a ready made cable, open wire line can be easily constructed. Almost any type of copper wire of fairly heavy gauge (at least 1mm diameter) will do the job. Single-core wire, rather than stranded wire, makes a more rigid job to keep the two wires parallel. For a given characteristic impedance, the wire spacing depends on the wire gauge used. The relationship between wire spacing, wire diameter and characteristic impedance is as follows:

Impedance $Z_o = 276 \log (2S/d)$ ohms

where S = Centre to centre distance between conductors

and d = Diameter of conductor (Same units as S)

With insulating spacers fitted, the actual impedance will be somewhat lower than that calculated from the formula. Spacers, as shown in figure 10, can be made up from any suitable low loss insulating material.

If the line is to be used in a tuned mode, the characteristic impedance is not really important and the line dimensions can be set to whatever is suitable for construction. The greatest losses in the tuned line occur at current anti-nodes due to RF resistance of the conductors and at voltage anti-nodes due to shunt resistance loss across the spacers. Whilst the TV line produces quite low losses, they can be reduced even further by making a link with a heavier wire gauge and increasing the spacing between the conductors.

Fields

If the open wire line is perfectly balanced, the fields around the two conductors are equal and opposite and hence radiation from the line is essentially cancelled. However, as the the wires are a finite distance apart, there must be a small differential field created which might be detectable close to the line. If installed close to say a microphone lead within the radio shack, the differential field might be sufficient to cause RF feedback, more so than coaxial cable with its confined field. One way to reduce the differential field is to twist or barrel roll the cable so that over a distance the differential effect is cancelled.

As the fields from the open wire line are not confined, the line must be spaced

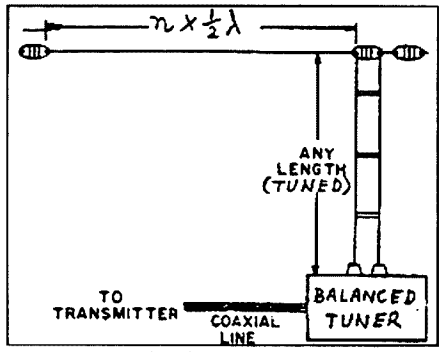

Figure 6. End fed (Zepp) antenna for multi-band operation uses tuned feeders.

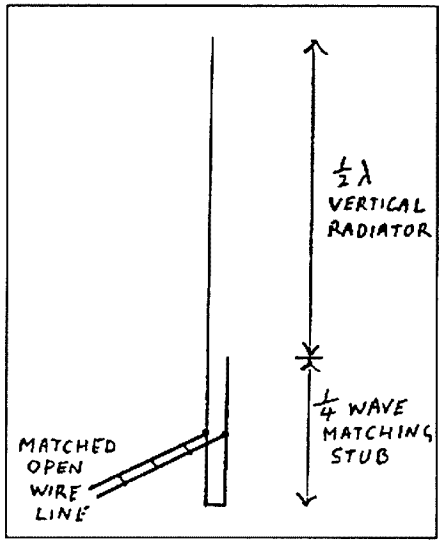

Figure 8. The "J" antenna with matching for open wire or other balanced lines.

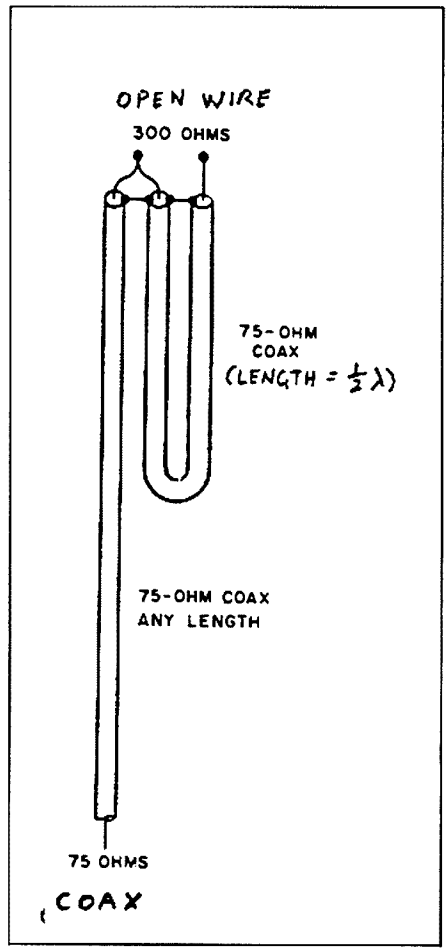

Figure 7. Coaxial cable balun - 75 ohm coax to 300 ohm open wire (reproduced from the ARRL Antenna Handbook).

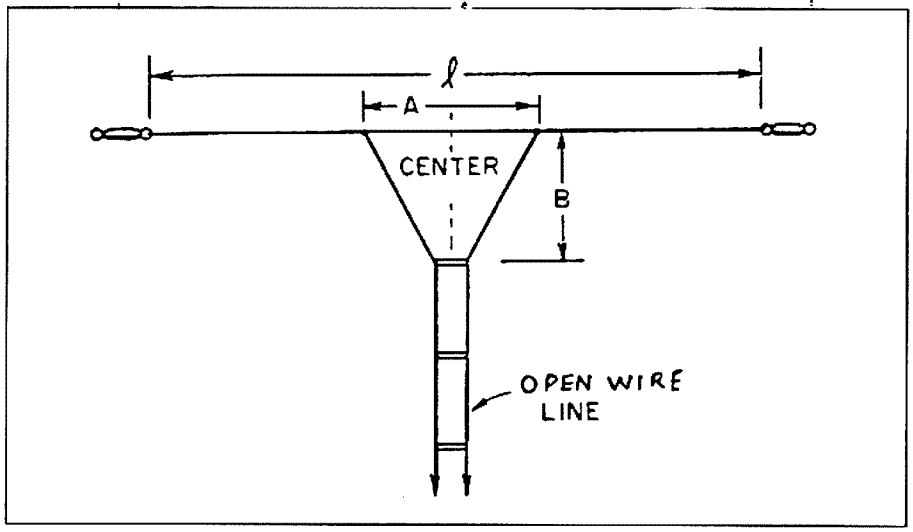

Figure 9. Delta match for balanced line.

out from any metal structure, such as a steel tower, to prevent the characteristics of the line becoming compromised. This does not prevent the line being used at such an installation but it is usually easier to use low loss coaxial cable which can be clamped directly against the metal sections of the tower.

Connecting to the Transmitter

Most transceivers are designed for a resistive RF output load of 50 ohms. A 2:1 turns ratio balun transformer can be used to reflect 75 ohms from a 300 ohm balanced line which is properly matched. A transmitter with a valve output stage and adjustable loading control can usually accommodate the 75 ohms. A transmitter with a solid state output stage is likely to be more critical and require a more precise 50 ohm load. For the 300 ohm line, this calls for a 2.45:1 turns ratio transformer, a little more difficult to achieve using the normal multi-filar winding technique on a toroidal core.

For tuned open wire lines or those with a high SWR, some form of balanced matching device is needed to interface with the transmitter. At HF, the Z match tuner has proved to be very useful for this purpose. Where a low loss transmission line is used, the main reason for adjusting to give a low SWR facing the transmitter is to present the correct load impedance to the transmitter This particularly applies to solid state output stages which are designed to protect themselves and shut down if not correctly loaded. If the transmission line has low loss, standing waves on the transmission line are of little consequence. Reflected power is not all just lost as some writers have often indicated When there are standing waves the feeder line becomes part of a resonant circuit and in a low loss line, most of the reflected power is returned to the circuit. If the SWR is 1:1 at the transmitter output, power not consumed by the antenna can only be dissipated in the loss resistance of the transmission line and in the RF resistance of the tuning and coupling components.

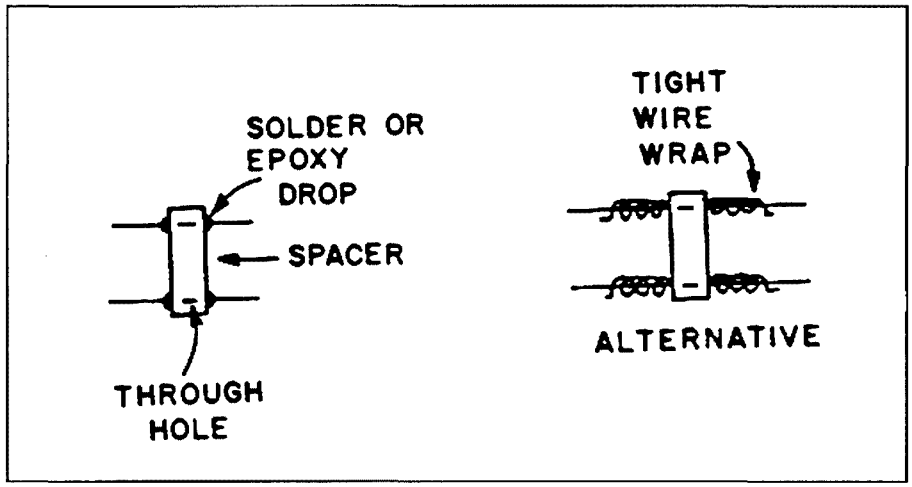

Figure 10. Insulating spacers fitted to open wire line. (reproduced from the ARRL Antenna Handbook).

Summary

Whilst heavy duty coaxial cable seems the best choice of RF transmission line to run up a solid metal structure, such as a steel tower, open wire line is often a better choice for wire antennas, particularly those functioning in multi-band operation. Because of its low transmission loss, the open wire line can be efficiently used on the high frequency bands with a high standing wave ratio or in a fully tuned mode.

A number of typical applications in the use of open wire line have been presented Particular attention has been given to the 300 ohm TV open wire line which is an excellent product for amateur radio use, if it can be obtained. Apart from its application in feeding HF antennas, it is also a good low loss line for VHF applications. (Of course it was designed for VHF TV.)

References

I. ARRL Antenna Handbook
2. Varney - The G5RV Antenna - *Amateur Radio* Dec 1982 (Reprint) ar

QRP Classics

EDITED BY BOB SCHETGEN KU7G
SUPPLIED BY STEWART ELECTRONICS $24.00

A collection of the best QRP projects from QST and the ARRL handbook.

The book consists of the following nine chapters.

Introduction.
Construction practices.
Receivers.
Transmitters.
Transceivers.
Antennas.
Accessories.
Power Supplies.
Design Hints.

The articles have been collected over the past 15 years and cover projects which could be built in one hour by a beginner through to more complicated projects for the more advanced constructor. Frequencies covered are 3.5MHz through to 50MHz. Receiver designs featured are from the simple direct conversion design to the more sensitive superhetrodyne.

One very interesting chapter is devoted to the construction of mini circuit modules constructed on 16 pin DIL headers. These modules include an audio amplifier with up to 40 dB of gain, a double balanced mixer, balanced modulator or product detector, and a crystal oscillator which can be used for fixed frequency operation or as an injection oscillator in dual conversion circuits. The final module is a Colpitts oscillator with varicap tuning. Using just four of these modules it is possible to construct a forty metre receiver.

It is important to note that not all the projects in the transmitter sections are for CW but cover SSB as well.

All aspects of QRP are well covered including efficient antennas and test equipment such as QRP directional wattmeter, SWR bridges, field strength meters, transmatches, frequency reference sources etc.

This is a most informative book written in the usual ARRL style and has something of interest for everybody. Reviewed By Bob Tait VK3ERG & Norm Eyres VK3ZEP.

Tower Height Adjuster

JOHN VOGEL VK6BA
6 BRAND STREET
CLOVERDALE WA 6105

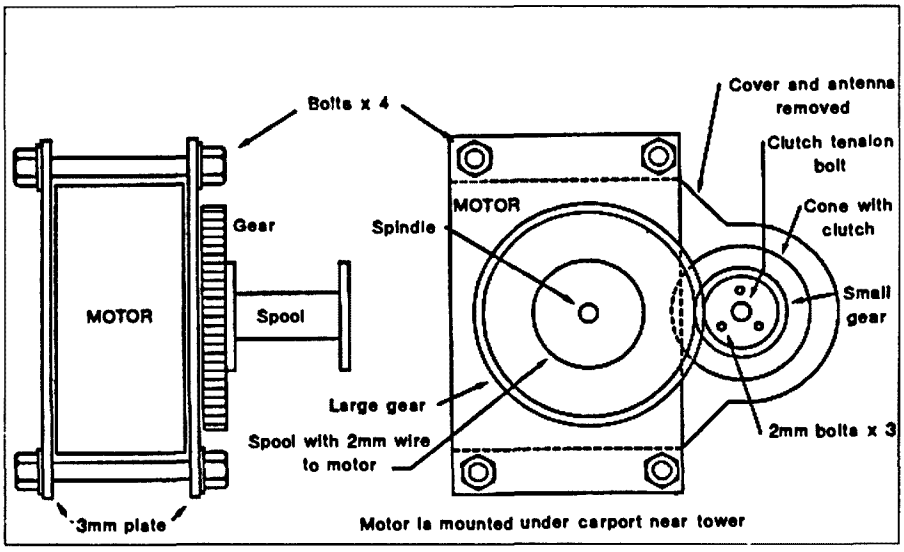

Figure 1. Winch.

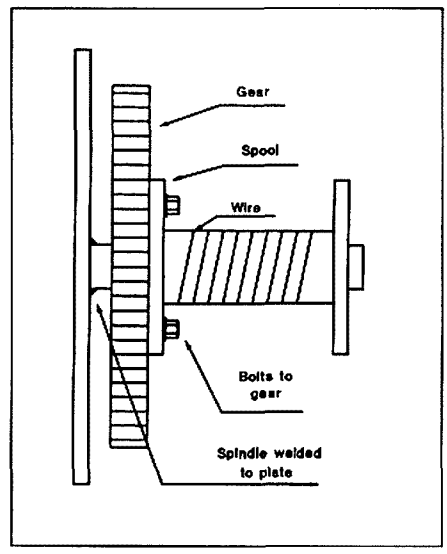

Figure 2. Winch Detail.

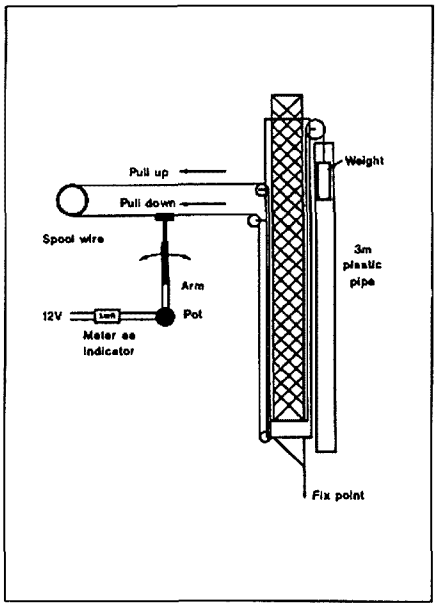

Figure 3. Winch and Position Indicator.

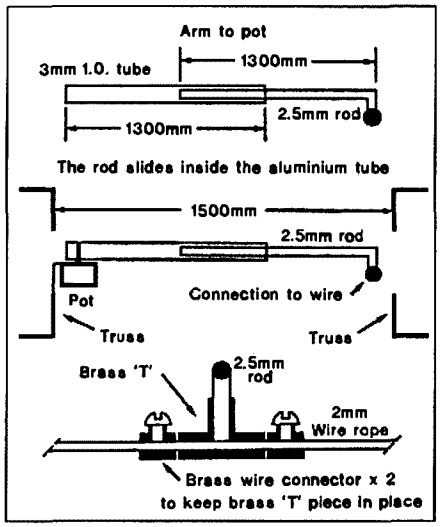

Figure 4. Position Indicator Arm; Position Indicator Arm Mounting; Connection of Position indicator to Winch Cable. The brass "T" swivels on the wire to compensate for height differences. The brass connectors drive it lengthwise.

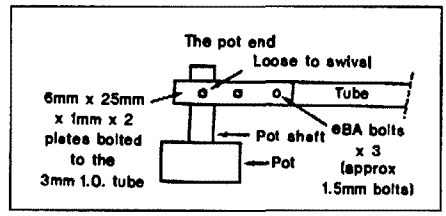

Figure 5. Connection of Position Indicator Arm to Pot.

WHILE EXPERIMENTING with a 2m antenna I needed to adjust antenna height frequently. Winding the telescopic tower up and down was fairly hard work. So I devised a counterweight set-up to make the job easier. To make it even easier, I also devised a motor and remote height indicator.

I put a pulley at the top of the fixed section and ran a steel cable through it to the bottom of the section to be lifted. On the other end of the cable I tied a length of two-inch water pipe which I filled with lead pellets to act as a counterweight. Lead pellets are convenient to use, and permit adjustment of the counterweight.

The counterweight was made a little heavier than the tower section so that the tower section would normally be raised. To lower the tower section I could pull on another wire rope attached to the bottom of the tower section.

To stop the counterweight blowing in the wind, a 100mm diameter plastic pipe was attached to the side of the tower for the counterweight to move inside. This allows the counterweight vertical movement and shields it from the wind.

A safety catch was added to the tower to prevent collapse in case the wire to the counterweight broke.

A winch and indicator were added so that height could be controlled from within the shack. The winch was made from an old electric car aerial and the indicator from a potentiometer and a meter from an old SWR bridge.

The winch is made from an old all-metal electric car aerial by stripping the

Continued on Page 17

The Three Coil Trick

ROBERT MCGREGOR VK3XS
2 WILTSHIRE DRIVE
SOMERVILLE 3912

A 10-WATT CW MONOBAND HF rig can provide fun and surprises on a trip away from the shack, but the only antenna that will fit into a briefcase is a roll of wire, some insulating cord, an earth lead with a battery clip and a small G clamp.

With the aerial wire strung up – or dropped out of the window – clip the earth lead to the water tap of the hand basin. Now we need to assemble the other two components needed to adjust the antenna impedance to the correct resistive load for the transmitter. Reactance correction is performed by either a series inductance or capacitance and the resistance value must be "transformed" to the correct value to load the transmitter (around 50 ohms). The smallest, lightest and cheapest way to approximate this value is by using a three-coil toroidal transformer.

Suitable toroidal cores are available (including data sheets) from Amidon. *(See trade Hamads in Amateur Radio - Ed).* Work out from the tables the number of turns required for 75 ohms and calculate the length of wire needed. Add 200mm to this figure for leads. Put a layer of insulating tape on the core. Cut three wires to the length calculated above. Bare and tin one at each end, just bare the end of the second and leave the third as it is. Using this method to identify each winding avoids the problem of labels dropping off as you twist the wires. Align (straighten) each wire before twisting the bundle by putting one end in a vice and gently pulling the other. A stretch of 2-3mm is sufficient. Now twist the three together without any overlaps and tape each end. Thread the bundle through the core, spacing the turns evenly around the toroid. Tape the windings securely for 100mm from each end. Terminate the windings along a piece of RF insulating material - a piece of perspex with six holes works fine. Now connect your coils series-aiding and it is ready for use. The value of 75 ohms was nominated as the transformer impedance as it will then accommodate 50-75 ohm rigs, and has applications for dipoles, single or two-wire antennas.

It is unlikely that you will exceed the range of values you can match using an end-fed wire antenna. Earth resistance and the series resistance of a tuning coil or capacitor will limit the lowest value that you may require. Should you have difficulty in matching an antenna, a modest reduction in its length will allow you to obtain a match. In this situation the antenna length is arbitrary and can always be adjusted to suit the resistive and reactive values that you have available. Remember to test it all before you go, as it is easier to make modifications at home.

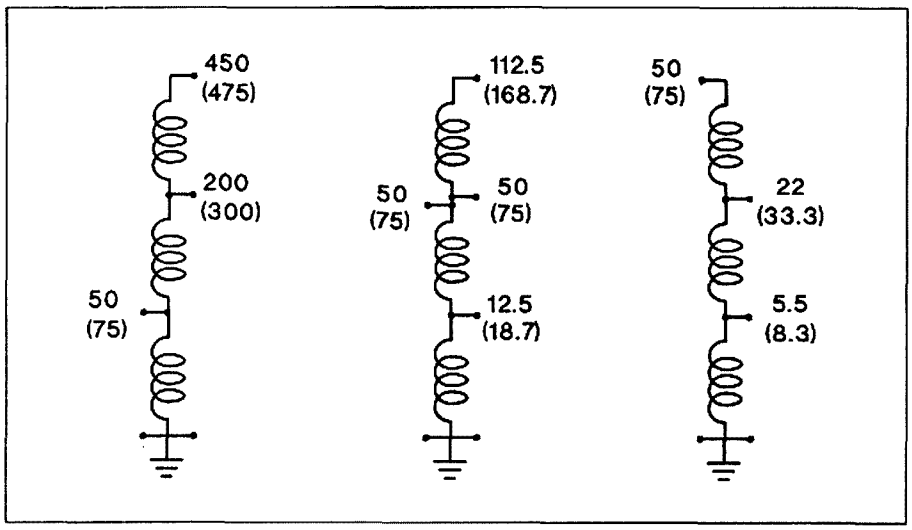

Figure 1. Possible Impedance Combinations (Autotransformers).

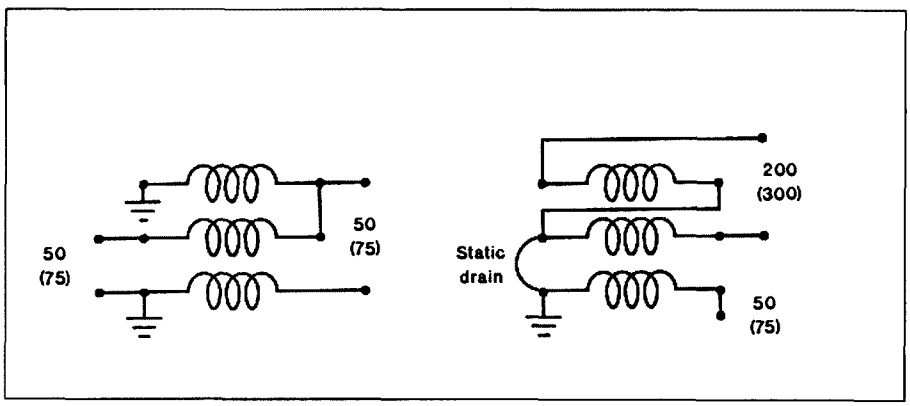

Figure 2. Balun Connections.

Better efficiency is obtained by using between $^{1}/_{4}$ and $^{5}/_{16}$ of a wavelength of wire for the antenna, as this is then tuned with a series capacitor. A two-gang broadcast band unit is suitable. Mount it with the frame insulated and the control shaft extended with an insulated rod through a small earthed metal plate. This reduces "hand capacity" effects and RF burns.

Depending on the antenna length, in wavelengths, you can connect the capacitor in two different ways. For maximum capacity, parallel the stators for one connection and use the rotor as the other. Longish antennas require less capacity to tune, but there is more voltage across the capacitor, so it is best to use one stator as one terminal, the other stator as the second terminal and leave the rotor floating. By adjusting the aerial length for 50 to 100 ohms resistive component, the earth losses are reduced to around 1dB.

With minor variations in the connections used, two additional transformer modes are available (see diagram for more information). Can you do without one in your shack? Have a go.

ar

Propagation of Long Radio Waves

PART 4 CONCLUSION
(CONTINUED FROM AUGUST ISSUE)

JOHN ADCOCK VK3ACA 12 ALBERT ST., OAK PARK, 3046

Horizontal Polarisation

IN THE PRECEDING TEXT IT WAS stated that with an LF signal there is no horizontal polarisation present perpendicular to the direction of propagation. There is, however, horizontal polarisation present in the direction of propagation. I wish to discuss several aspects of both these statements.

Horizontal Polarisation in the Direction of Propagation

When a vertically polarised signal travels over the surface of the ground the lower end of the wave front, in effect, drags behind the space wave above the ground (see figure 12). This is brought about by the ground having a higher conductivity and refractive index than the air, and causing the wave to have a lower phase velocity in the ground than in the air (or space). In fact, this is an application of the optical law which states that when a wave moves from a medium of low-refractive index to one of higher refractive index, the direction of propagation of the wave will bend towards the normal, that is it bends towards the perpendicular to the ground. In fact, below the ground the signal is almost horizontally polarised.

The effect of this is that, at a relatively low height above the ground a horizontally polarised component of the signal exists. This component is present in both the surface wave and the normally vertically polarised component of the sky wave and, surprisingly, the effect can be of significance at HF. The phenomenon allows the use of a directional receiving antenna known as the *Beverage* (see Figure 12). The Beverage antenna is basically a long wire travelling wave antenna running in the direction of the received signal. The antenna is usually terminated in a resistor equal to its characteristic impedance at the front end and the receiver at the far end. The antenna can be less than a wavelength to many wavelengths long; the longer the better.

The principle of the antenna is that it intercepts the horizontal component of the signal as it travels along the antenna. The induced signal adds in the antenna until it reaches the receiver. These antennas have been traditionally used on long wave since early times. Most amateurs may not be able to erect such an antenna long enough to be of much use on LF. The method is still worth keeping in mind. Many amateurs have certainly used Beverage antenna on 1.8MHz and higher with considerable advantage.

Horizontal Polarisation Transverse to the Direction of Propagation

It was stated above that this characteristic is ineffective at ground level. Horizontal polarisation reception at the higher medium frequencies has been of particular interest to the author, and was the main subject of an article some years ago (Ref 6). Many amateurs have made use of short or full-size dipoles on 1.8MHz for reception with great advantage, and it is felt that a more detailed discussion is in order.

Refer to figure 13. Imagine the transmitting antenna is at point 'a' and the receiving antenna at point 'b' shown as a horizontal dipole. An electromagnetic wave is a transverse wave motion and can, therefore, only be polarised perpendicular to the direction of travel of the wave. If the propagation is along the ground, direction A, that is, perpendicular to the antenna (assume a lossless situation), the strength of the signal at a given distance will depend upon the radiated power and distance. If the direction of radiation is vertical, direction C, there can be no radiation as an antenna cannot radiate off its end. If we consider a direction of propagation at an angle, direction B, to the ground then, from the geometry of the configuration, the field will have an amplitude proportional to the cosine of the angle to the ground. This is shown by the vector triangle in figure 13. In the case shown, the angle of radiation 'e' is at 60^0 and, therefore, the strength of this field is reduced by cos 60, that is, 0.5 or -6dB.

This cosine factor is the cosine in equation 10. In similar manner, when the signal reaches the receiver, assume a vertical antenna here for the moment, the polarisation is not parallel with it which, by the same geometry, is also proportional to the cosine of the angle to the ground. This is the second cosine function in equation 10.

If the receiving antenna is a horizontal dipole, then reception is maximum vertically and zero horizontally. Even though the transmitting antenna is vertical, the received signal has a horizontal component parallel to the ground, so long as the launching angle is not completely vertical or horizontal. The received component of the incoming signal parallel to the antenna is proportional to the sine of the angle of reception to the ground. In the case under discussion for a reception angle of 60 to the ground, the received signal will be reduced by sin 60, that is, .87 or 1.2dB. This is shown in the second vector diagram in figure 13.

On medium frequency a dipole, even a small dipole, which is balanced and accurately horizontal will give high rejec-

Tower Height Adjuster

Continued from page 15

antenna parts, leaving the motor and clutch. See figs 1 and 2. I fitted the motor to a 3mm plate with bolts, and fitted a nylon 30mm gear from a washing machine to the clutch with little bolts. The clutch was a plastic cone with a centre tensioning bolt. Another gear of 100mm diameter was mounted on a spindle attached to the motor plate with a spool for the wire to raise and lower the tower section.

The motor assembly was mounted under a carport near the tower. An up/down switch and a 12V supply allow the tower section to be raised and lowered from the operating position. To indicate the position of the tower section I fitted a potentiometer with a long arm to the raising and lowering wire. An old meter obtained from an SWR meter was used to indicate the position. The potentiometer varies the current from the 12V supply, and the meter can be calibrated with the tower position. See figs 3, 4, 5, 6 and 7. **ar**

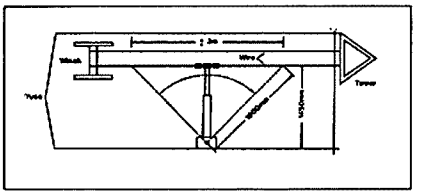

Figure 6. Connection of Arm to Pot.

tion against vertical polarisation. Such an antenna will reject the surface wave and most noise and enhance the high-angle wave. On 160m horizontal polarised reception is a great advantage in the "interference zone" where the surface wave equals the ionospheric wave and beyond up to about 800km.

(Surprisingly horizontally polarised reception on 160m not only gives better reception on short hop signals, but often gives better results for DX reception. The reason for this is not easily explained and could be a subject for research).

On low frequency, one might expect to obtain a similar advantage. However, such is not the case, and this leads to the next subject.

Lack of High Angle Radiation on Low Frequency

The lack of high-angle radiation on LF is not surprising when you look at equation 7 and also observe Figure 11. From equation 8, it is obvious that at frequencies much above 200kHz the reflection coefficient at the conductivity discontinuity will be poor at low angles. At this rate there would be no ionospheric propagation of the type described here in the broadcast band at all.

There must be a transition between reflection at the conductivity discontinuity described in Part 3 of this article, and reflection due to decreasing effective refractive index with height described in Part 2. What might happen is that, at a high angle of radiation — say at 200kHz — the reflection at the discontinuity is very poor. Some of the signal might pass through and be reflected by the E layer in the manner described in Part 2 (HF type reflection). This change should become more obvious with increasing frequency, and probably the transition takes place somewhere in the broadcast band. Texts on this subject are very poor in information on ionospheric propagation on medium frequencies.

If a high-angle signal exists it should be detectable with a dipole. Also, if a dual path exists, this should also be detectable in the form of very slow fading under certain conditions. The author has tried a number of experiments at his QTH to detect high-angle radiation using a dipole. Non-directional beacons at the LF end of the beacon band were used as experimental signals. So far, no high angle of radiation has been detectable. This would tend to indicate that the method of calculating ionospheric reflection coefficient given by Watt is correct, at least below 250kHz.

The main difficulty with this experiment is that a low short horizontal dipole

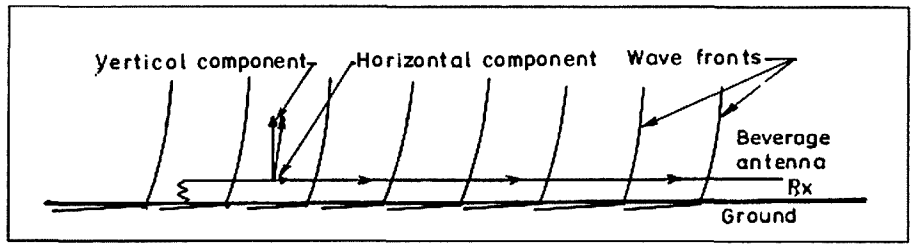

Fig 12 Showing how a travelling wave is formed on a Beverage antenna.

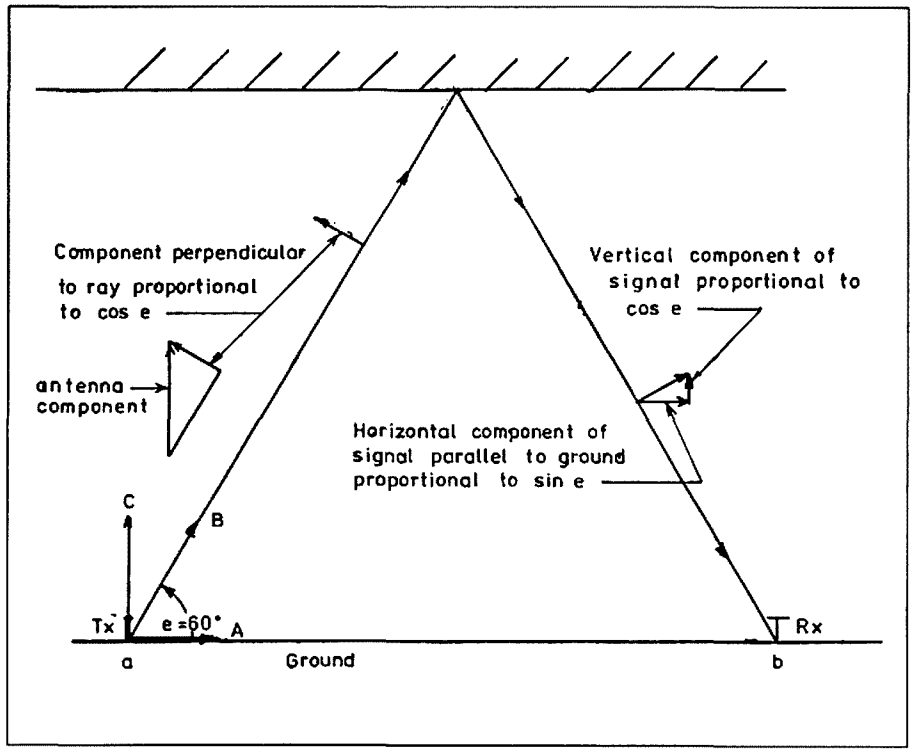

Fig 13 Showing that a signal ray with a high angle of elevation has a strong horizontally polarised component even when transmitting antenna is vertical.

is very inefficient. This is firstly because it is short and secondly because of interaction with the ground at a low height. The efficiency of a low short dipole decreases approximately with the fourth power of the inverse frequency. For example, if a dipole delivers 100 microvolts to a receiver at 1.8MHz for the same signal strength it will deliver 1 microvolt at 196kHz. A second difficulty with the experiment is that the surface wave is very strong and a high vertical rejection is required by the dipole.

This low output is not impossible to work with. If there was any high-angle signal content in the received signal, it should be detectable. The experiment is certainly worth repeating with a bigger dipole. There must be plenty of people living in the country with big dipoles.

The Sporadic E Similarity

It was stated in part 3 that this plane surface type reflection was unique to LF. However, one can't help observing the similarity between this type of reflection and reflection by sporadic E at HF/VHF. Reflection by sporadic E was described recently in an excellent article in 'AR' (Ref 7). Sporadic E is similar, in that it is in the form of a thin mirror-like layer, the reflection coefficient is less the higher the frequency, and it is better at a low angle than at a high angle. It is also noted that a high-angle signal is only partly reflected and part is reflected by the layer above.

Surprisingly, there is such a thing as "sporadic D"! Usually referred to in LF as ionospheric disturbances. Stratified ionised layers can form between 50 and 90km above the ground, and are described by Watt. Although they do not reflect HF, and may result in increased loss, at LF they result in signals being reflected at a lower height.

VLF Ducting

Wave guide type ducting between the

D layer and ground for LF waves between 10 and 30kHz is fairly well known, and often referred to in articles on the subject. Although this frequency range falls outside that covered in this article, it is interesting to show how ducting relates to all that we have been talking about. Some explanation is in order.

There is no space available to explain wave guide theory here, and interested readers should refer to the many texts on the subject. Even at 10kHz, the gap between the ionosphere and ground is more than a wavelength. Briefly, when an electromagnetic wave is ducted in a wave guide with surfaces more than a wavelength apart, waves will travel along the guide, being reflected between the two surfaces at such an angle that the wave fronts are all in phase vertically. That is, in the case of the VLF propagation, each wave front advances as a single unit spanning vertically from the ground to the ionosphere. The angle of reflection of the waves forming the waveguide mode is critical. The most basic mode is the TEM1 mode. The TEM2 mode is a second-order resonance etc. The angle of the rays to the surface forming the mode decreases with increasing frequency.

Propagation efficiency for a particular mode between the ground and ionosphere is low, when the angle of the ray to the ground is high, and is maximum when the angle to the ground is zero. Above a certain frequency, the particular wave guide mode parts company from the ground, and exists under the ionosphere only, and thus becomes decoupled from the antenna. The TEM1 mode reaches maximum efficiency between 12 and 20kHz. The TEM2 mode reaches maximum efficiency between 20 and 40kHz, depending upon the time of day or night. Above the TEM3 mode, the modes become so mixed they are of little significance.

The phase velocity of propagation making use of these modes is very accurately predictable, and it is on this principle that the Omega navigation system operates.

In brief, propagation at 200kHz is the same as at 10kHz, in that it depends on reflection between two low-conductivity concentric spherical surfaces between 70 and 90km apart — the ground and the conducting or D region of the ionosphere. One difference is that, at the low-frequency end of the band, the propagation is dominated by wave guide modes which control the wave front velocity, and in general make propagation very predictable over global distances. With increasing frequency, propagation efficiency falls off, until other propagation media become dominant. At frequencies below 10kHz, the high angle of reflection determined by the TEM1 mode as well as insufficient conductivity in the D region causes propagation efficiency to fall off.

Final

With all this I will go back into my shack for a while and leave readers to think about it. After a while, I would like to hear some interesting discussion on the subject.

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Remember to leave a three-second break between overs when using a repeater

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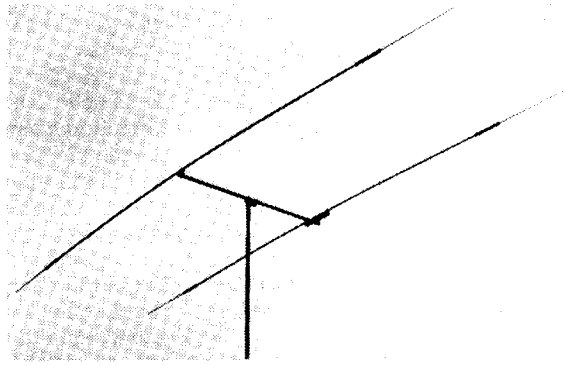

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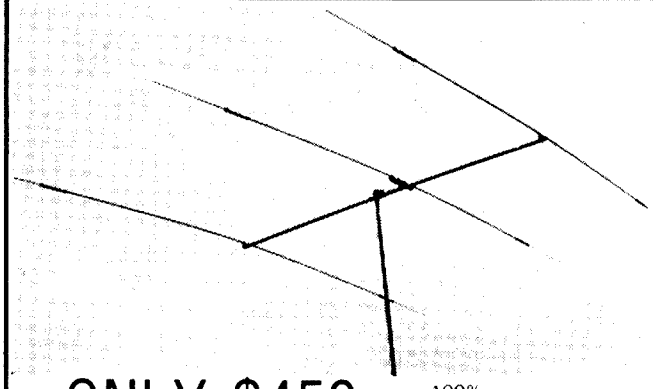

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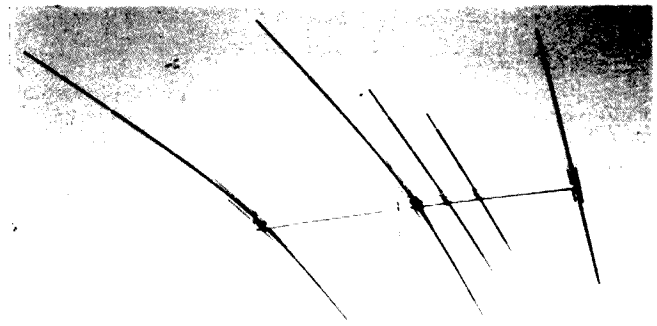
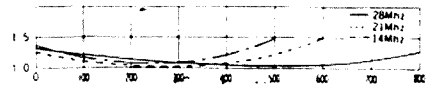


BAND — 14/21/28 MHz
GAIN — 8.5, 8.5, 9.5 dB
F.B RATIO — 25dB OR BETTER
POWER — 3kw
BOOM — 4m
MAX ELEMENT LENGTH — 10.6m
WEIGHT — 22kg



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Wells Quadrants

THIS INFORMATION WAS forwarded by Peter VK3BWD via two metres and is reproduced here as a slightly edited transcript.

Readers will now be aware of the reactivation of the VNG Time and Frequency Standard transmissions from Llandilo following the demise of the service from Lyndhurst. In various news items about the new service the antennas used are described; indeed, on the front cover of *AR* March 1989 there is a photograph of one of the Wells Quadrant aerials used on the three frequencies now in use.

Some readers may not have encountered the Wells Quadrant Aerial. Wells was employed by the Marconi Wireless Telegraph Company and published a number of remarkable technical papers during 1939-45, remarkable at least because publication of technical information on antennas was generally prohibited by wartime security.

One of these aerials was the Quadrant Aerial, an omnidirectional, horizontal, wideband aerial for short waves. The name gives a clue to the problem Wells was trying to solve; what horizontal aerial will give an omnidirectional azimuth pattern at some frequency and will not depart from the pattern by more than a predetermined amount as the frequency is varied over a reasonably wide band. Amateurs with some experience of HF transmissions in the maritime or aeronautical service will understand the need for a base station radiation pattern without too many holes in it. Also, such an antenna is useful when there is a need to operate on several spot frequencies in a given band, for example when using the calling and distress frequency of 4,125kHz, it is necessary to switch promptly to a radio telephone frequency around 4,400kHz.

Wells found that an essentially omnidirectional pattern, rather like a square with rounded corners, could be obtained with the Quadrant Aerial which consists of two horizontal arms running at right angles to each other and fed at the apex, that is to say a 90° vee antenna. He found that the radiation pattern was good when the arms were of the order of a half wavelength long, but as the frequency was raised the pattern broke up into a series of significant lobes and nulls. Wells also examined the use of a cage of symmetrically disposed conductors instead of a single conductor in each leg; in this he was trying to extend the useful bandwidth to around an octave, and reduce the excursions of feedpoint impedance with change of frequency.

He settled on a practical cage of four wires just as is shown in the photo of the cage at Llandilo.

The Quadrant Aerial has stood the test of time. There are several of them at OTC Melbourne Radio, Cape Schanck on the Victorian coast. One has a leg length of 14 metres at 10.7 metres above the ground, and is used to receive from 7 to 12.3MHz, and another of leg length 18.9 metres some 18 metres above the ground radiates a kilowatt or more in the range 6.2 to 7.6MHz. Many others are to be seen around the country.

Wells reported an extensive range of measurements and practical results for stacking and grouping quadrant aerials in his paper in the *Journal of the Institution of Electrical Engineers*, UK, Volume 91 pt 3, 1944, pp 182-193.

Thank you Peter for that contribution.

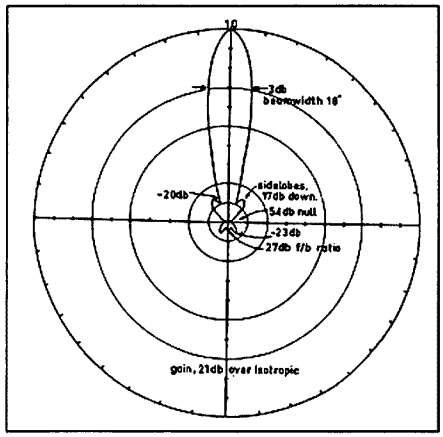

Figure 1. Fifteen-element Quad Yagi Antenna Pattern. Test frequency 144.1MHz. Circles are at 5dB intervals. The boom length was 10.1m (33 ft). See text for element details.

NVIS

What is NVIS? Bill VK3MI adds to his previous contribution with the following explanation.

Further to the notes on high-angle propagation from low horizontal antennas (Random Radiators *AR* p8 May 1991), there is now a set of new high-tech initials for this technique! These are "NVIS" for Near Vertical Incidence Skywave propagation (*RadCom* RSGB p32 Jan 1991) referring to its use for military HF communications.

Historically, of course, the British Army used this technique in the 1930s, intentionally or otherwise, for low power field portable stations in the 2-8MHz range (Signal Training, All Arms 1937) using low "Windom" antennas.

Then, when re-equipped by Racal Pty Ltd in the 1960s for the same type of communications, the very low horizontal loop was the antenna applied to the job, and the propagation technique was well understood. In addition, the SSB equipment introduced was much less susceptible to "selective fade" in the overlap between direct and skywave propagation which had bedevilled the previously used AM-style equipment.

From the early 1950s, the Country Fire Authority in Victoria, and later the State Emergency Services and other similar public utilities in the 3.75MHz frequency band have used this style of propagation for reliable local communication except, of course, during severe ionospheric disturbances.

However, with this modern acronym applied, NVIS propagation may finally achieve prominence in the amateur field, at least among the local rag-chew brigade, though NOT with the DXers!

Quads Fight Back

From Ian VK3ALZ comes some notes in support of the Quad. I have made some minor editorial changes to the text as supplied.

Fourteen MHz is not an ideal antenna comparison frequency. Twenty-eight MHz is a better choice - in addition on F2 paths a low wave angle is desirable at this frequency, therefore, with few exceptions,the antenna with the sharper pattern will rightly be the best at 28MHz.

At VHF the situation is different, as a free space environment is easy to achieve. If we concentrate on measuring over tropospheric paths, the better antenna will produce the best result.

In the article in an earlier Random Radiators, mention was made of doing measurements at UHF or microwave frequencies. In my view this is a big mistake, as a parasitic array at UHF or microwave is not the same antenna as at HF. This is due to a number of factors, of which the main one is the L/d ratio of the elements. If we were to use the same L/d ratio at 1296MHz as at 14MHz, the skin effect losses in the thin element could be excessive, bearing in mind the high currents in the driven and parasitic elements. Hence a different performance would be measured.

Also there is distortion of the pattern due to the metal boom and increased dielectric

losses at 1296MHz. If you change the L/d ratio to reduce the losses you do not have the same antenna any more.

In reference to long Yagis, the maximum gain long Yagi, eg the original W2NLY-W6QKI 144MHz design will always have minor lobes. If this design is scaled to 432MHz the pattern becomes a mass of minor lobes.

My experiments with long quads at 432MHz (in the late '60s and early '70s) using W2NLY spacings always produced an antenna with a clean pattern. Subsequent experiments showed that the close spaced directors in this design were redundant for the quad configuration.

At 1296MHz the design still produced an acceptable pattern. The spacings used are as follows:

Reflector: 0.15 to 0.18
(adjust for best F/B)
Dir #1: 0.15
Dir #2: 0.20
Dir #3: 0.25
Dir #4: 0.32
Dir #4: 0.32
Dir #n: 0.32
ie fixed spacing from director #4 on.

The same spacing is used on all bands, and the driven element is always one wavelength long. The reflector is 1.05 wavelengths and the directors are 0.95 wavelengths long. L/d compensation as per standard texts is necessary.

For 432MHz I generally use a wooden boom. On 144MHz it is okay to run the boom through the centre of the quad. I use circular elements on 432 and 1296, although it doesn't seen to matter if square elements are used. The circular elements are easier to make, an important consideration if you need a lot.

I have found that replacing the wire reflector on 432 and 1296 with a perforated metal screen gives a greatly improved F/B ratio and a slight improvement in forward gain.

The measured radiation pattern for a long Yagi using Quad elements is shown in figure 1. The dimensions are as described in the preceding text.

Thank you Ian for sharing your knowledge and experience. Certainly your many fine DX contacts attest to the effectiveness of your long quads.

A Beam for all Bands (Well, nearly)

Apart from the log periodic type of aerial, there does not appear to be any commercial beam aerial capable of operating on all five HF bands from 14-30MHz. Faced with a desire to have better performance than the old G5RV could give, but restrained by the need to keep the load on the top of the tower to a reasonable level, I delved into the handbooks to see what could be done. I was also influenced by having recently read John Kraus' autobiographical account of antenna development, "Big Ear". The good old W8JK

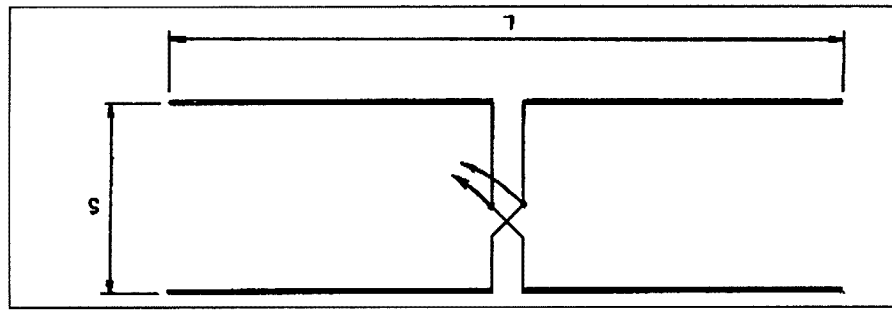

Figure 2. W8JK Schematic (plan view). For 14-30MHz operation, L = 10.21m (33'6"). S = 2.59m (8'6"). The spacing between the two parts of each dipole can be about 150mm (6"). The feedline is connected to the centre of the phasing line. This impedance of these is not critical; however, both must be low loss with high VSWRXs. Three hundred or 450 ohm "ladder line" or similar home-brew open-wire line would be suitable.

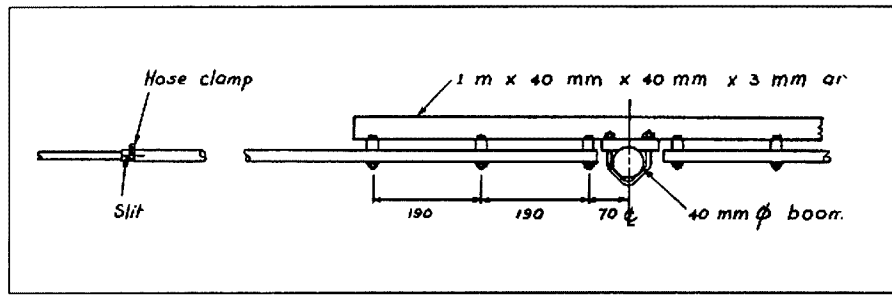

Figure 3. Construction Details. The angle is aluminium and clamped to the aluminium boom using standard TV antenna fittings. Each element consists of four lengths of aluminium tubing fitted together by using a hacksaw to make a slot in the larger tube, sliding the smaller tube inside about 75mm (3") and clamping with a stainless steel hose clamp. Element details: 22mm dia (7/8") 1.50m; 16mm dia (5/8") 1.30m; 12.5mm dia (1/2") 1.275m; 9.5mm dia (3/8") 1.185m. See figure 4 for details of element to angle mount.

seemed worth investigating.

It has the advantage of requiring only a 9ft boom and two 33ft long elements, yet can cover 14-35MHz. A plumber's delight construction using aluminium tube elements and 300-ohm ladder line for the feeder was settled on. Like most amateurs, I have thought that open wire or ladder line was impractical for a rotating array. Not so. The judicious use of TV-type insulated standoffs and a modest loop of feeder provides a practical solution.

The major features of the W8JK may be summarised as follows:

- Covers a 2.5:1 frequency range.
- Has zero radiation vertically above the antenna, regardless of height above the ground.
- It is bidirectional so long path/short path considerations do not matter.
- Gain at 14MHz is between 4.5-5dB (free space) and rises to about 6-7dB at 28MHz.
- Construction is simple, it can be a wood and wire, or all metal tube device. This means a cheap and light beam.
- The azimuth radiation pattern is a simple figure of eight, becoming sharper as the frequency is increased.
- On 14MHz it is a two-element beam with half-wave elements, centre fed, becoming a two-element beam with full-wave elements, end feed on 28MHz.
- Dimensions are not critical.

The result is a performance not much short of the standard three-element tribander, for much less in price, but with the additional bonus of operation on 18, 24 (and 27MHz if you have the need to listen on that band). Of course, the ability to operate over such a wide range of frequencies comes with the small inconvenience of using an ATU. The (you guessed it) Z match is ideal. The twin wire feeder and the range of impedances seen at the end of it are easily accommodated by this unit.

Details of construction are given in figures 2, 3 and 4. In service, the beam

performed much as was expected. It was outclassed by the "big guns" used by the famous DXers, but was usually at least two S units better than the G5RV used as the reference antenna. Disadvantages of the beam are:

- The maximum gain is limited by losses in the elements and feedline. These losses are probably no more than 1dB, especially for the tube construction as compared with the wire version.
- As the front-to-back ratio is 1 there may be occasional problems with interference not apparent to conventional beam users.
- Short skip signals are weaker than for a conventional beam because of the cancellation of high angle radiation.

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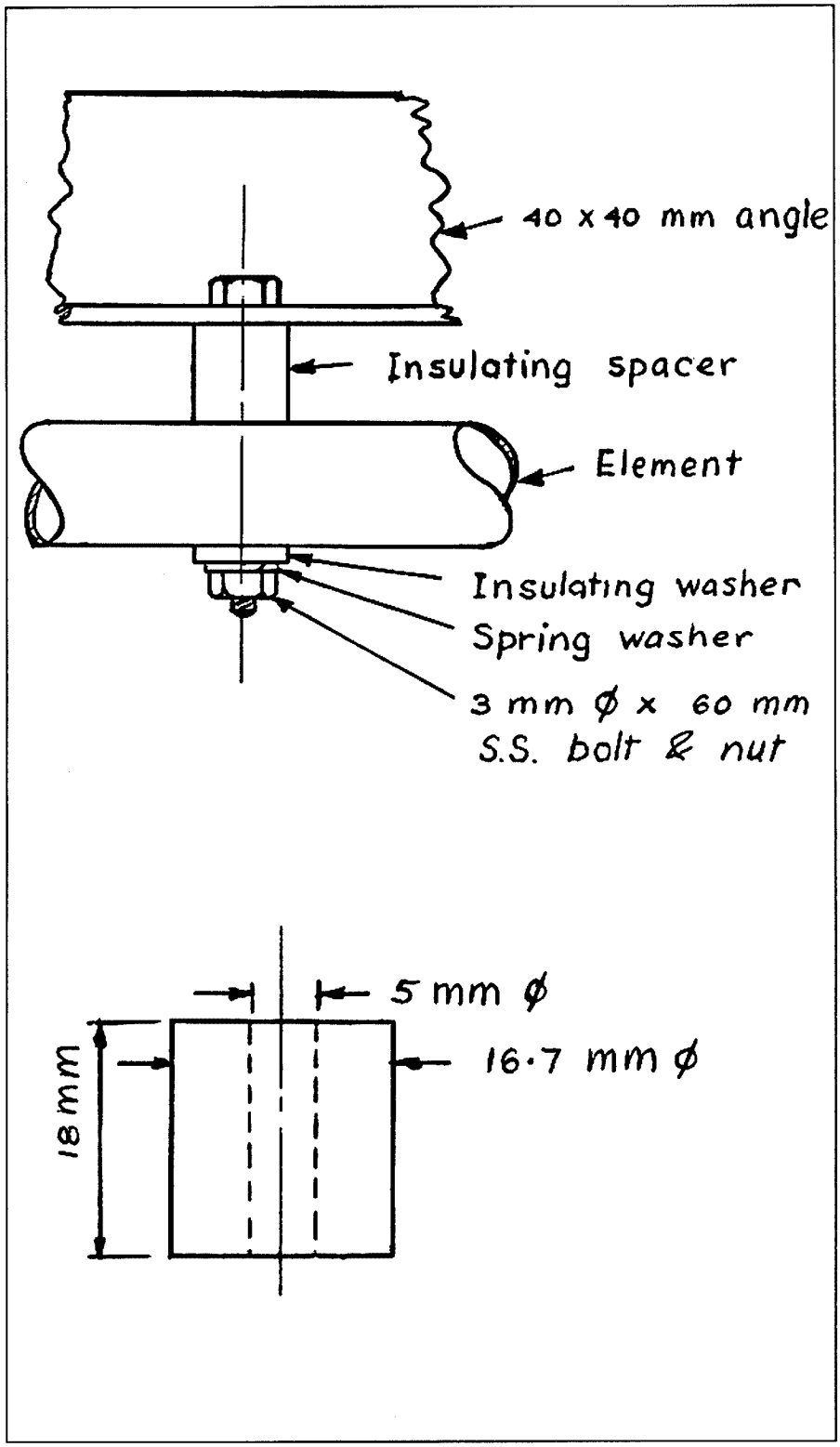


Figure 4
(a) Element Mount Details
(b) Insulating Spacer Details
Element Mounting Details. Insulator material polycarbonate. Other plastics may be suitable.
Note: The bolt has a sleeve of plastic tubing (ex coax outer) as additional insulation.

Getting Started in Amateur Radio Satellites - Part 8

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD
YARRAVILLE 3013

LAST MONTH THE SUBJECT was the packet radio satellites. Maybe you've already had some success in that area. This month I'm going to take an overview of all the Oscars, past and present. We'll then take a mutual look into that big crystal ball in the sky. Who knows what we'll find.

You may have heard expressions like "phase 3C" etc. No great mystery. This refers to the categories or developmental phases of the Oscars. I'll describe them briefly and then look at the features of the groups one at a time.

Phase 1, as the name suggests, includes the early satellites with beacon transmitters only.

Phase 2 development included the early transponder satellites, the scientific experimental birds and the new microsats. Much more development will take place in this category. Phase 1 and 2 satellites are/were all in near-circular, low-earth orbits.

Phase 3 saw the deployment into high, elliptical orbits of much more sophisticated spacecraft. We can expect more phase 3 spacecraft. Planning for Phase 3D is already well under way.

Phase 4 is still very much in the early planning stage. There is much conjecture as to whether it will proceed to fruition. If it does, it will take amateur radio into the realm of geo-stationary satellites with the potential for spacecraft linking and true worldwide VHF, UHF and SHF communication. The ultimate Oscars! Well, nearly ... as we'll see later.

Now, some detail. The phase 1 satellites, Oscars 1 to 5, carried various kinds of beacons. From the rudimentary Oscar-1's HI, HI, HI in morse, to some quite intricate telemetry devices in the later phase 1 birds. An enormous amount was learned about the potential of amateur radio satellites from the first phase of development. The early pioneers of ham radio in space have long ago decayed into the atmosphere, so let's look at the satellites in the next phase of development. Many of these are still operational.

The phase 2 satellites represent the largest group. Being in near circular orbits they are relatively easy to launch and therefore they have the greatest potential for further development, particularly in the digital communication area. This group includes Oscars 6, 7 and 8, the experimental Uosats ie. Oscars 9, 11, 14 and 15 and the current batch of microsats, Oscars 16, 17, 18 and 19. The two Japanese birds, Oscars 12 and 20, and the Russian Oscar 21, are also in this category.

Although not called Oscars, the Russian "Radio Sputniks" RS-1 to RS-11 have fallen into these first two categories. The latest radio sputnik was given the name Oscar 21 when it came into service. Is that glasnost or perestroika at work? The Oscars are numbered according to their order of achieving orbit and controlled operation. The oldest Oscar still in orbit and operational is Oscar-10. The previous oldest was Oscar-9 (UoSat-1) which entered the atmosphere and burned up in November 1989. Oscar-10's high perigee of nearly 4200km will ensure that it stays aloft for a very long time, although it is no longer under ground control due to radiation damage to the on-board computer. If it remains operational (and doesn't hit anything) it should go on to become the "grand old bird" of the Oscars.

The phase 3 group consists of only two satellites, but these are the most sophisticated so far. They are, of course, Oscar-10 and Oscar-13. The high elliptical orbits require expensive launches. There will never be a lot of phase 3 birds up there at once. Phase 3A didn't make it into orbit, phase 3B did make it safely into orbit to become Oscar-10, phase 3C became Oscar-13 and phase 3D is still in planning. They carry rather comprehensive systems with attitude control and lots of goodies. Phase 3D may even have three axis stabilisation to allow earth-pointing antennas at all times. Phase 3 satellites carry multiple transponders and extensive telemetry, all kept under control by a u-beaut housekeeping computer. No doubt phase 3D will contain high speed data and mailbox capability and transponders up to at least mode S. Its orbit and design are under intensive study at present.

Phase 4 is as yet only a dream. But then we wouldn't have an amateur radio satellite program at all if far-sighted, hard-working talented people hadn't turned dreams into reality over the past 30 years. Phase 4 is often called the ultimate amateur satellite system. It envisages a series of three satellite in geo-stationary orbit. All will be mutually "visible" to each other. They can, therefore, be interconnected to give true worldwide coverage. They will be given the name AMSTAR. Amstar-1 will be over the Atlantic Ocean, on the equator, of course. Amstar-2 will be over the Pacific Ocean, and Amstar-3 will be over the Indian Ocean. This will be the most ambitious amateur radio project of all time. It will take many years of planning and will draw on the total engineering experience of the Amsat organisations worldwide. It will require huge injection of funds, much of which will have to come from outside amateur radio. It will ultimately test our operating practices and procedures to the limit. It may well be our application of the Amateur's Code that decides its success or otherwise. (And I don't mean Morse). Have you re-read the Amateur's Code recently?

Unfortunately, the news is not good regarding phase 4. It was announced in April 1991 from AMSAT-NA headquarters that the project has been "canned" due to lack of funds in the foreseeable future. We can only hope that this very ambitious project will one day be brought out of mothballs and go on to completion.

Now what about the immediate future ... ?

With phase 3D planning well under way there seems little doubt that it will proceed to completion. The sheer expense of projects like phase 4 seems to indicate that much future development will take place in the phase 2 and phase 3 series. The microsat concept has been developed with this in mind. These remarkably small devices (they are only 9" cubes) offer the greatest value-for-money amateur satellites so far. The first batch of four microsats launched in early 1990 have achieved outstanding results. The next batch may include an Australian microsat. It will be known as VKSAT. A

planning group has already been established to get this under way. If you're interested in taking part in this exciting project, get in touch with the secretary, Andrew Woolf, at the Australian Space Engineering Research Association, PO Box 184, Ryde NSW 2112. You don't need to be highly technically qualified to make a contribution. There are project groups operating in Sydney, Melbourne and Adelaide. The microsats seem to be ideally suited to digital modes of communication. It looks like flying mailboxes with data rates of 9600 bps and above will become the order of the day in the not too distant future. These little birds could become our most efficient means of worldwide amateur radio communication.

There will, of course, be other goodies from time to time. Like the long-awaited French Arsene satellite. This device will orbit the equator like a geo-stationary bird but it will have a highly elliptical orbit. It should apogee at about 36,000km and perigee at about 20,000km. It will carry mode B digital and mode S linear transponders. This will be the first venture by AMSAT-France and a very ambitious one it is. Good luck to them. If it works as planned, it will be better than any other Oscar yet launched.

Looking further ahead ...

Quite apart from further development in the Oscars, and there will no doubt be many, there are two very exciting projects on the horizon. they are both timed to take place in 1992, the international space year (ISY). The first is an international sailing race to the moon. Yes, you read that correctly, a sailing race to the moon to commemorate the 500th anniversary of Columbus' epic journey of 1492. Do you remember that from school days? "In fourteen hundred and ninety two, Columbus sailed the ocean blue". It will be known as the "Columbus 500 Space Sail Competition", an open international competition to design and launch lightweight spacecraft with huge "sails" made like the radiometer devices we all remember spinning around, powered by sunlight, on the windowsill of our school science classroom.

The second project is just as exciting. A lunar polar prospector satellite. This project has been on NASA's books since the end of the manned lunar missions. It is a scientific remote sensing package that will orbit the moon's poles, spending much time over the lunar polar regions. It will be looking for water which may exist as ice in the permanently shadowed polar regions of the moon. It will also be looking for radon and other gases on the lunar surface. Sources of these elements would be of great benefit to any permanently manned moon mission.

Both of these projects involve amateur radio. The AMSAT organisation has been approached by both NASA and WSF, the World Space Foundation. These are the principal bodies involved in the two history-making events. AMSAT will supply much of the communications know-how and equipment for telecommand and remote sensing telemetry. Knowledge gained from the microsats will be critical in the design, fabrication and testing of the communication packages.

Of course, both these projects will have amateur radio transponders. They will be in the UHF/microwave regions, probably L and C band. We'll need to brush up on our techniques and get ourselves into gear. Who said amateur radio is on the way out? Imagine the excitement of working through a transponder in orbit around the moon? With projects like this already announced, who knows what's on the back-room drawing boards? But you can bet that if there is even the remotest possibility, then amateur radio will be involved through AMSAT and its worldwide affiliates. It seems that our reputation is such already that well respected engineers and organisations are seeking out our participation. Take a bow everybody. The next two parts in the series will deal with orbital geometry, keplerian elements and the computers that (hopefully) make sense of these essential aspects of amateur radio satellite operations. ar

Equipment Review

RON FISHER VK3OM
GAALANUNGAH
24 SUGARLOAF RD
BEACONSFIELD UPPER 3808

The Kenwood TS-450S All Mode HF Transceiver

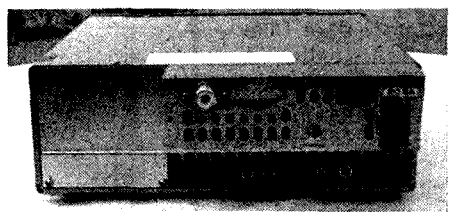
IT SEEMS THAT THE DESIGN staff at Kenwood have really been working overtime, with three new HF transceivers hitting the deck over the past few months. Firstly, the TS-850S, which seems to be creating quite a stir amongst the DX experts, and now a replacement for the popular TS-440S. We hope to take a close look at the 850 in the very near future, but for the moment we will concentrate on the 450. However, to round out the story, the new 450 is also available with 6m coverage, and in this guise is called the TS-690S.

The TS-450S follows the line started with the TS-430S back in 1983. Yes, it doesn't seem that far back. The TS-440S was introduced in 1986, so both of these have been around a long time. All three models share a very distinct family resemblance. All were built to provide a general coverage receiver with transmit output on all of the HF amateur bands. All have 100 watts output, and the two later models have built-in automatic antenna tuners. Front panel size is the same for all transceivers, with the depth varying slightly with each model. The new TS-450S is actually 8mm shorter than the TS-440, however, it weighs in at 200g more than its predecessor.

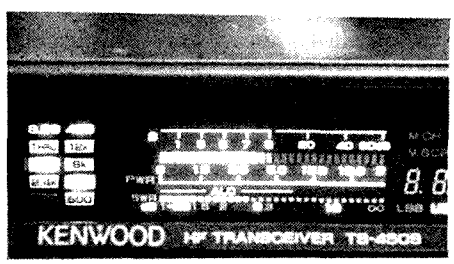
Probably the biggest change to the casual observer is the new colour - it's now charcoal black in place of the old silver grey. I've never been enthusiastic about black equipment, but I have to admit that the TS-450 looks very smart.

The TS-450S' New Features

Many of the new features on the 450 have been carried over from some of recent Kenwood HF transceivers such as the TS-140 and the TS-950, and many are brand new. Let's look at some of them. The meter is now a digital bar type with a multi-function display. In other words, you can monitor two different parameters at the same time. On receive, the 'S' meter function is on at all times. As well as this, the audio output level from the appropriate detector in use can also be monitored. This function can be selected or de-selected as required. On transmit, the normal indication is for power output, with either ALC or SWR measurements as selectable options.



Rear view of the TS-450S. The blank panel on the left takes the 6m final for the TS-690S



The Metering System on the TS-450S. Note filter selection indicator on the left.

Memory channel selection now has a separate control - you don't have the confusion of using the normal tuning knob. The memory channel knob becomes the VFO channel control when in the VFO mode.

This useful feature was first seen in the TS-140/680 and later on the TS-950. On the 450, the normal step is 10kHz, but this can be changed to either one, two or five kHz. As is usual these days, there are two VFOs, but now on the 450, thanks to the new direct digital synthesizer, the tuning is much smoother with an almost complete absence of clicks and plops. Also as a result of this, a tuning rate of one kHz per tuning knob revolution in 1Hz steps is provided as a selectable option from the standard 10kHz per knob revolution. As with the TS-440, 100 memory channels are provided. As well as storing frequency and mode, they can store filter selection and AIP selection (more about AIP soon). With the addition of the separate memory selector control, and some changes to the memory controls, the whole memory system is now much easier to use. As with the 440, memories can be allocated for such things as setting limits for programmable band scan and for split frequency operation. Ten memories are available for setting tuning limits for, say, 10 segments of amateur bands to allow VFO tuning confined to those band segments. This feature is certainly a boon to the contest operator for setting up sections of the bands required to either tune through or scan across.

The AIP or "Advanced Intercept Point" first featured on the TS-950S and then on the TS-850, is included in the TS-450. The AIP allows the operator to choose between high front end gain (AIP out), or for a reduced gain with reduced noise floor level and increased intermodulation characteristics. One very nice features of this is that AIP is automatically switched in for reception on the lower frequency bands where lower gain is very desirable. However, if the higher gain is needed under perhaps low ambient noise portable operation, it can be switched out.

Filter selection has been upgraded on the TS-450S. It is now possible to make independent filter selection in both the 455kHz IF and the 8.83MHz IF channels. A selection button is provided for each IF channel and the selection takes place sequentially. This is, of course, provided that some of the optional filters are installed. A special display to the left of the meter shows the selection. Strangely though, no display indicator is provided for the narrow SSB filter, although this filter can be installed in the transceiver. You can, though, have a wonderful choice of selectivity for AM reception with either 12 or 6, 6 with tighter skirt selectivity or 2.4kHz. No actual 6kHz crystal filter, as offered with the R-5000 receiver or the TS-930 and TS-940 transceivers, and even the old TS-430, is available for the TS-450.

On transmit mode, better control over power output is provided with both a carrier and a power control. The "power" control will reduce the transmitter output on SSB down to about eight watts. With the accurate power metering, it will be easy for novice operators to set the 450 up for exactly 30 watts output. Transmitter cooling has come in for attention with two cooling fans built into the final amplifier. These come on as soon as the transmitter is keyed up on any mode. The

Australian version of the TS-450S will come complete with a built-in automatic antenna tuner, but the TS-690 (the version with 6m coverage) will not have the ATU as standard. It will, however, be available as an option. Interestingly, both transceivers will sell for the same price. Take your pick, an auto ATU or six metres. Both transceivers have been configured to connect to the Kenwood DSP-100 digital processor unit. According to the Kenwood literature, this unit converts the signal into a digital waveform (and back to analogue) and permits the audio passband to be tailored for maximum clarity. As a DSP-100 was not included with our review transceiver, we were unable to check its performance.

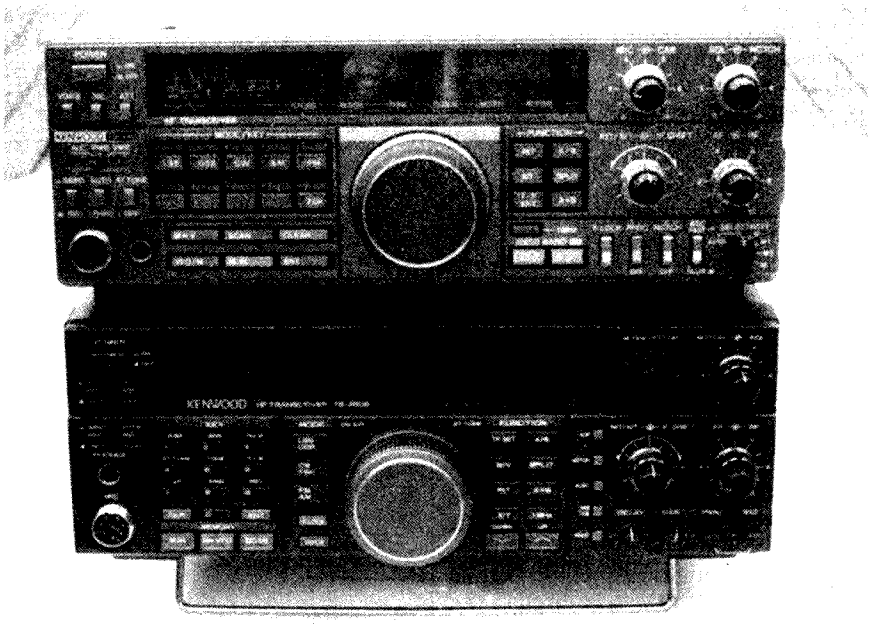
The TS-450S on the Air

The first thing noted was the improved feel of the main tuning control. Having just been reacquainted with the TS-430 (the old original), I think that the feel of the main tuning deteriorated somewhat on the 440S. It lacked the finger hole provided on the 430's tuning knob. It also had a rather sharp edge at the front, making it uncomfortable to rotate by rolling your finger around the circumference. Well, the 450 doesn't have a tuning knob with a finger hole, but it is very much smoother and is, in fact, not far behind the famous 930/40/50 tuning knob. As with the earlier model, the dial drag is fully adjustable.

With the AIP switched out, the receiver felt very lively. I did a side by side test against the 440, and while no discernible difference could be detected in signal readability, the 450 certainly produced more audio output at a given setting on the audio gain control. I am sure many mobile operators will appreciate the extra gain. Lack of receiver gain is a common complaint from TS-440 owners using their rigs under mobile conditions.

Next thing noted was the very marked increase in status indicators. There is one for just about everything. In fact, the only thing that lacks an indicator is the receiver RF attenuator. Have you ever wondered why your receiver sounds dead? Maybe the next model will include an indicator for this. One of the nice features on the later Kenwood transceivers is the automatic sideband selection when changing bands. Naturally the TS-450 has this feature too.

Frequency readout is to 10Hz and is certainly accurate to within better than +/- 50Hz. If you need better stability than this, then you should order the SO-2 superior stability temperature compensated crystal oscillator. This has a stability of +/-5 10^7 which should please the most critical. The RIT/XIT readout is to the nearest 100Hz. Incidentally, the RIT/XIT can be programmed to cover either +/- 1.1 or +/- 2.2kHz. This is one of the many functions selectable when the transceiver power is switched on.



The Old and the New. The TS-440S on top, the new TS-450S below.

Received audio quality was very good. On both SSB and AM the audio was clean and well balanced, with very low distortion at normal listening levels. I checked the SSB/CW product detector distortion and found it to be only 0.6 per cent, an excellent figure. The internal speaker produced very acceptable quality, but the transceiver really deserves a good external speaker to make the most of the rig's capability. The headphone output is compatible with stereo phones, and the output level has been set to suit low impedance headphones.

AGC has fast or slow selection, but there is no provision to disable it. The slow position produces very well controlled action with no sign of pumping on decay or clicking on make. To be critical, I would prefer the slow action to be just a bit slower. In fact, come to think of it, I have yet to see an amateur transceiver the AGC of which was anywhere near too slow. I note that the noise blanker now has a normal and wide selection. While the old Russian Woodpecker has all but disappeared, it seems to have been replaced by several other intermittent nasties, so I am sure that the wide noise blanker will come in handy from time to time. The level of blanking is not adjustable, but seems to have been rather well set. Some cross-modulation is noticeable, but overall is not too bad.

I am glad to see that the speech synthesised frequency readout is still available as an option. I am sure our sight-impaired amateurs will appreciate this.

In the QRM reduction department, the TS-450 has an IF shift and an audio notch filter. Both of these have been with us for a long time, and are still very worthwhile. In fact, I much prefer the audio type notch filter to the more upmarket IF type. The latter usually has a notch which is too wide at the top of the curve, and so affects the audio quality to a very marked extent. The audio type as fitted to the TS-450 is sometimes a bit difficult to set but, once adjusted, is very effective and does not cause any loss of quality.

Of course the receiver is only half the story. Let's see how the transmitter performs. Firstly, the output power was checked and found to be right up to the 100 watt mark on all bands. Although we did not have a TS-690 to test, is was noted that the output on six metres is a very healthy 50 watts. There is also a separate SO-239 connector for the 6m antenna, or you can switch both 6m and HF output to the same connector. All very nice.

An interesting point is that the power supply rating for full output needs an output of 20.5 amps. Although my power supplies are only rated at 20 amps, they didn't blow up or, for that matter, do anything strange at all.

Actually putting the transmitter on air produced the first surprise. The two fans came on straight away. While they are not too intrusive, they are not exactly whisper quiet either. However, running all the time, they should keep things very

cool.

SSB quality was checked using three different microphones. The MC-42S handheld, the MC-60 desk microphone, and my faithful Shure 444D. All produced first-class audio, but in general the two desk microphones were preferred. Just the same, you will not be disappointed with the results you get from the standard hand mic.

One of the things I haven't been asked by our readers to check on is the CW keying. The 450S's CW output was very clean. Several checks were run, but no sign of clicks was detected. The tests were carried out using a straight hand key.

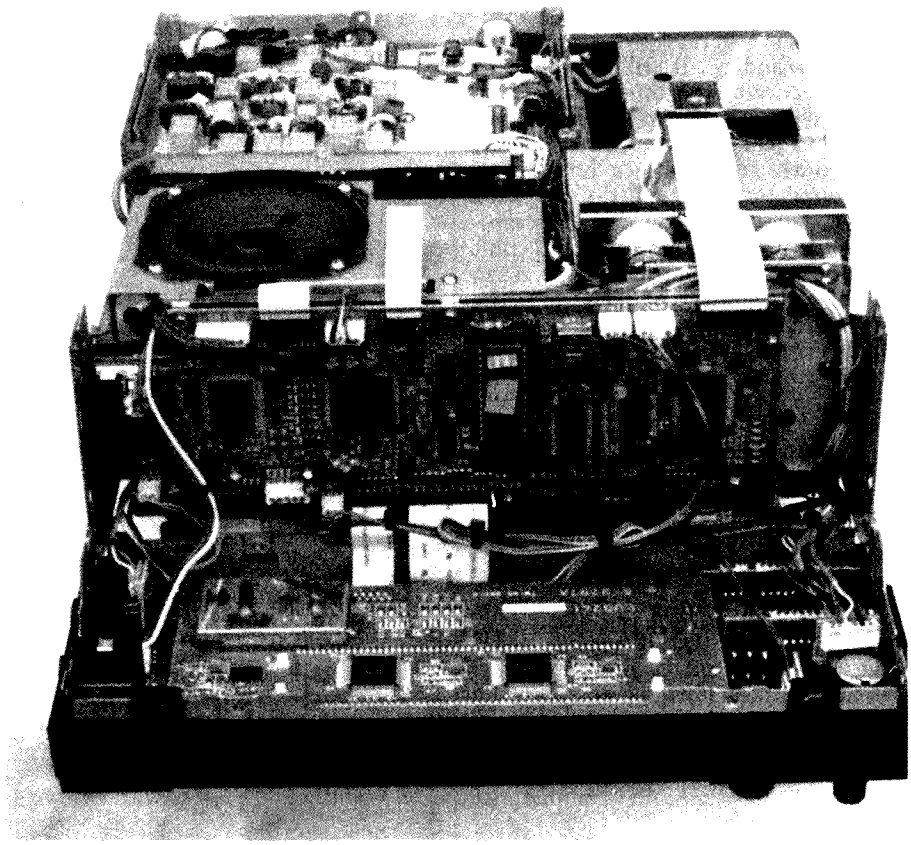
Getting away from old-fashioned CW, those interested in digital modes won't be disappointed with the TS-450. There are dedicated connectors for connection to a RTTY keyboard as well as a TNC to interface with your own computer. Details on how to do this are well covered in the instruction manual.

Finally, the speech processor was tried. The processor used in the 400 series transceivers is a fairly simple audio compressor. It is not as complex or as effective as the RF processors used in the TS-850 or 950 transceivers. Nevertheless, the processor in the TS-450 is very worthwhile. I suggest that it should be used only when working DX under difficult conditions. Local stations might find it a bit too forced. Overall, the transmitter parameters have been well optimised, and the results achieved were very satisfactory.

The TS-450S Optional Accessories

If you want to dress up your TS-450 transceiver, Kenwood has a great range to tempt you. Let's look at them in the order you might need them. Firstly, there are two power supplies, both rated at 20.5 amps output. The standard supply is the PS-33. This will happily run your TS-450, but is not designed for continuous output. The PS-53 is a full output supply, with built-in cooling fan and a full range of protection circuits. The power supplies will not be available in Australia until late 1991 or early 1992.

Of course, the built-in auto antenna tuner, the AT-450, is available as an option for the TS-690. Another ATU, the AT-300, is also offered. I don't know much about this one; it appears to be suitable for mobile operation as it can be mounted externally from the transceiver. Three desk type microphones are available, the MC-85, the MC-80 and, of course, the deluxe MC-60A. I know the MC-60 well, and it is indeed a superb microphone. With luck we might be able to review the other two in one of our mini reviews in the near future.



TS450S with front panel lowered. Auto ATU is on right side.

There are no less than seven optional filters available. For CW operators there are two 500Hz filters, one at 455kHz and one at 8.83MHz. The same system applies to the 250Hz filters.

Two optional SSB filters provide 1.8kHz bandwidth and an additional 2.4kHz filter to tighten up the normal response. Both of these are at 8.83MHz.

To finish off the picture, there is a very nice looking SWR/power meter, a 232 interface unit, the VS-2 voice synthesiser and, of course, the DSP-100 digital signal processor.

The TS-450S Owner's Manual

As is usual these days, the instruction manual is just that. Unfortunately, no technical information at all is presented, apart from a circuit diagram. I feel that a few pages of circuit description would be welcomed by most amateur operators. From the point of view of a purely instruction manual, the TS-450/690 (it covers both models) does a very good job. Not that it is without errors. For instance, on page 27 it tells you to speak into the microphone from a distance of about 5cm (6"). I leave it to you to guess the correct distance. Information on fitting the various accessories is very clearly presented. Overall, not bad, but, with very little effort, could be much better.

The TS-450S Conclusion

There is no doubt that Kenwood has produced a worthy successor to the TS-430/440 line of transceivers. It is good enough to tempt me to sell off my 440 and replace it with the new 450. I don't know. I will need to think about that for a while. Would I recommend it to an amateur looking for a new transceiver? Yes, no doubt about that at all.

There are so many very good aspects about it. The excellent tuning ergonomics, the great receiver performance. The good audio on both transmit and receive. Would I buy the digital processor option? Again I don't know. I would need to be convinced of its worth. I really think that very few will take up the opportunity. Perhaps Kenwood needs to tell us more about it.

Our review transceiver was supplied by Kenwood Electronics Australia, and all enquiries should be forward to it or one of its dealers. ar

Transmatch Tuning Noise Bridge

PETER PHILLIPS VK2EPP
18 BRIDGEVIEW CRESCENT
THORNLEIGH 2120

THE NOISE BRIDGE IS A very handy device for those interested in experimenting with different antenna types and associated facilities for matching to the nominal 50 ohm transceiver impedance. The construction of such devices is relatively straightforward and there are many articles on this subject. However, the tricky part comes with the need to calibrate the variable reactive and resistive bridge terminations and to tune out unwanted stray reactance so that the bridge can measure a range of impedances over a wide frequency range with reasonable accuracy.

Some time ago I had the rewarding experience of constructing a variable noise bridge, but I find that I rarely use the instrument to its full capabilities. My main use for the bridge is to check that experimental antennas and associated matching arrangements present a nominal 50 ohm resistive impedance at my transceiver to achieve the desired 1:1 VSWR match. For this purpose, the noise bridge termination is set at the 50 ohm/zero reactance setting and antenna and/or transmatch adjusted to provide bridge balance and hence achieve the much sought after "perfect match" for transceiver operation.

It occurred to me that it would not be difficult to build a simple and compact noise bridge that could perform the above specific task and be left permanently connected between transmatch and transceiver. The bridge is switched in and out of service as shown in diagram 1. This would be of value not only when experimenting, but also in normal HF operation to achieve good antenna/transceiver matching with the minimum of power-up tuning.

Diagram 2 shows the circuit of such device as constructed. Its simplicity lies in the straightforward bridge configuration which requires a 50 ohm internal bridge termination only, and it is compact because the bulky variable resistive and reactive bridge termination arms are eliminated. Other than checking that the bridge can be balanced by a 50 ohm resistive input, no calibration is required.

When the noise bridge is switched into circuit, the antenna or transmatch is connected to the input arm of the bridge balance coil, and the transceiver, in the receive mode, is connected to the bridge noise pick-up coil. When the antenna/transmatch is adjusted to present 50 ohms zero reactance at the input arm this balances the 50 ohms termination on the other side of the bridge balance coil. The noise signal from the noise generator, which is fed into the centre-tap of the bridge balance coil, then divides equally into each arm of the bridge balance coil.

Both arms are terminated in 50 ohms. Hence equal but opposite currents from the noise generator in the bridge balance coil arms result in nominally zero flux in the toroid core and hence minimum signal in the receiver pick-up coil. The bridge is in balance. Variation in output impedance of the antenna or transmatch from 50 ohms will result in bridge unbalance and a net toroid flux, resulting in a signal in the receiver pick-up coil.

Construction

As diagram 2 indicates, the tuning noise bridge circuit may be divided into three sections:

a) The Noise Generator

This is only one of many design types that may be applicable. It basically consists of an amplifier capable of delivering a broadband noise signal over the HF spectrum. The input noise signal is derived from transistor T1 which has its base/emitter inputs connected in a reversed biased mode. T1 collector is not used and left open circuit in this application. (Note: make sure you connect T1 base/emitter as shown in the diagram as this configuration provides the major noise source). The components used in the noise generator are not critical, and resistor/capacitor/transistor types/values may be varied markedly from those shown whilst still providing good performance (ie, this is a good junk box project!).

b) The Bridge Coil

This simply consists of two coils of eight turns of thin solid conductor hook-up or enamelled winding wire wound on opposite sides of a toroid core. One of the coils is centre-tapped to provide the bridge balance coil, while the other forms the noise pick-up coil. The construction of the bridge coil is not critical and various wire types/toroid sizes may be employed, but keep in mind that neat and symmetrical coil windings will enhance the balancing capabilities of the bridge. I also tried winding the coils in a balanced bifilar mode on a small "binocular" core that was obtained from an old 300/75ohm TV antenna transformer. I mention this because some constructors may find toroid cores hard to obtain. In this case, high capacity coupling between the balance and pick-up coils is unavoidable, but the performance of the finished bridge was still reasonably good. To achieve the required 50 ohm bridge termination resistance I used two 100ohm half-watt carbon film resistors in parallel.

c) Input/Output and Switch Circuits

RF input/output for the antenna/transceiver connections were achieved by suitable lengths of flexible 50ohm coax terminated in the normal PL-259 plugs for connection into the (antenna) transmatch and transceiver. The bridge ends of these cables were hardwired directly on to the bridge changeover switch. The bridge switch is used for connecting the transmatch directly to the transceiver for normal operation or inserting the noise bridge in series when measurements are required. A six-pole two-position rotary switch was used for this purpose, with two poles operated in parallel for each side of the RF switching (to ease the load on the individual switch contacts). One of the remaining two poles was used to switch the 12-volt power input on and off.

I have not specified detailed mechanical construction information, as this is relatively simple and may be left to the particular requirements of the individual constructor. However, in my case I employed my normal construction practice of using a piece of scrap laminex as a baseboard and mounting the components through holes drilled in the board as per printed circuit board style. The protruding leads of the components were then cut fairly short and interconnected by lengths of stripped down light duty "rainbow cable". This provides compact wiring and colour coding for ease of circuit tracing. The circuit board, switch and indicator LED mounted comfortably into a small 110x51x70mm aluminium box obtainable from most electronic suppliers. One point to note is that the bridge coil, associated termination resistor(s) and changeover switch should

be mounted so that they provide straightforward and short wiring paths for the RF.

Testing

When constructing equipment I like to test each module of a unit as it is completed, as there is nothing worse than having completed a beautiful looking job only to find that it is necessary to strip it down again to debug it! Accordingly, I suggest that the noise generator be wired up first, visually checked, powered up and connected directly to the antenna input terminal of the transceiver in the receive mode. When the receiver is tuned across all the HF bands a strong random noise signal should be then received of strength at least S9 or higher. Next, wire in the toroid bridge, together with its 50 ohm termination, and connect the bridge pick-up coil to the receiver input, leaving the bridge antenna input open-circuited. Again, a strong noise should appear in the receiver because the bridge is unbalanced. Then connect a 50 ohm resistor between the transmatch input to the bridge and earth. The noise detected at the receiver should then drop to almost zero as the bridge should be in balance and this should be the case on all HF bands. The switch input/output arrangements may then be wired and checked carefully, both visually and with an ohm-meter, and finally connected to the noise bridge module.

Operation

Connection to the antenna, transmatch, transceiver may then be made as per diagram 1. It is probably best to start with the transmatch set at a position where you know that your transceiver gets a good match. Switch the tuning noise bridge to the test position and tune the receiver in normally (with AGC in the fast setting). Then, if necessary, trim the transmatch tuning controls until a distinct dip is detected on both the transceiver S meter and reduction in the noise audio volume. (Note: the dip in noise level should be very distinct at the exact balance point, but some noise may then be heard that is being received normally by the antenna. For this reason it is usually best to check that the band is relatively quiet at the frequency at which you decide to test). If a distinct dip in the random bridge noise cannot be found, this may be an indication that the transmatch range is insufficient to provide a perfect transformation to 50 ohms at the desired frequency. However, assuming a balance point is found, the output of the transmatch should look like 50 ohms resistive and present close to a 1:1 VSWR to the transceiver when the

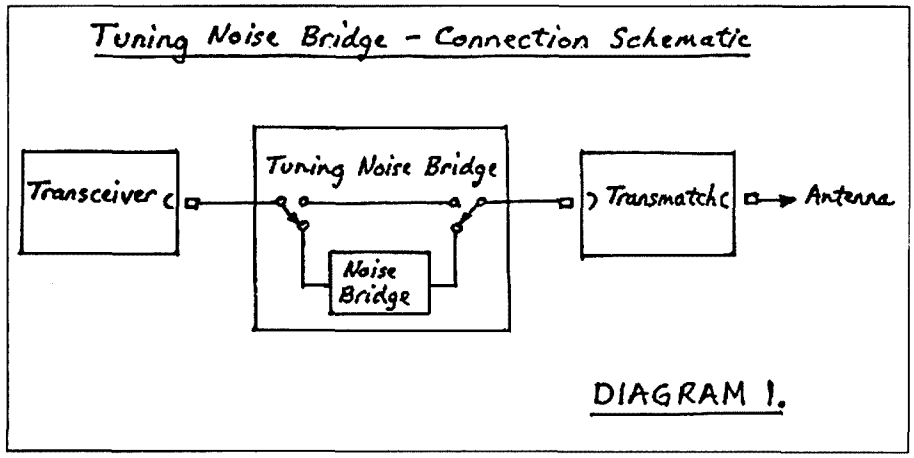


Diagram 1

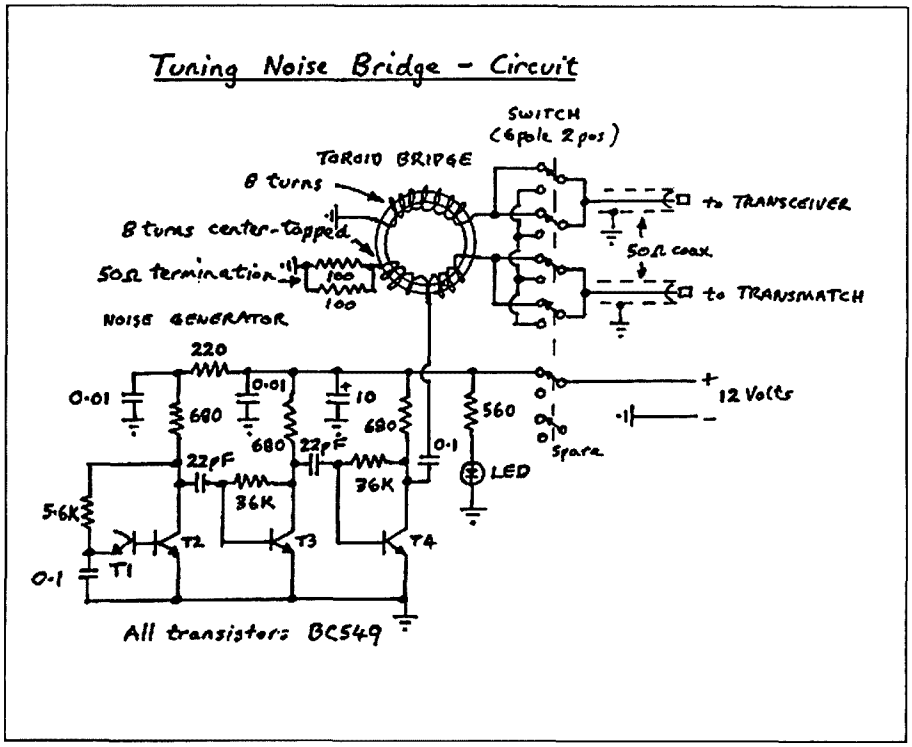


Diagram 2

tuning noise bridge is switched to "off" (ie, transmatch then connected directly to the transceiver). You may find, in fact, that on key-down condition of the transceiver, the VSWR is slightly higher than 1:1 because of small practical differences in the nominal 50 ohms impedance as indicated by the tuning bridge or presented by the transceiver. The ideal 1:1 transceiver match may be achieved, if necessary, by further slight tweaking of the transmatch controls under the normal key-down tuning procedure. Exact matching may also vary across a particular HF band, and the noise bridge will be useful in checking such variations before transmission.

Caution!

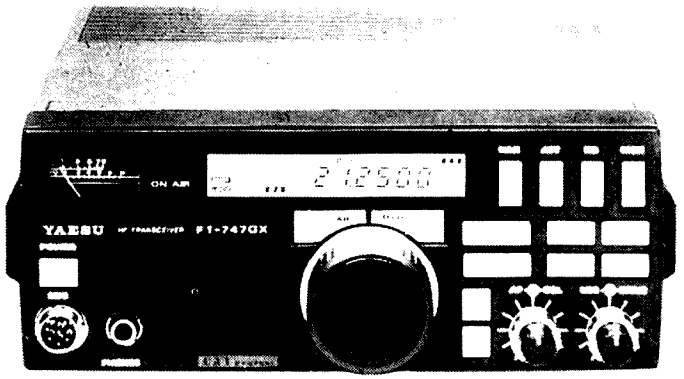
The facility to switch between the tuning bridge and normal transceiver operation may give rise to the situation where transmit power is inadvertently applied to the tuning bridge. To minimise this possibility, the transceiver should be operate in the receive-only position with the power amplifier RF excitation turned down or off when the tuning bridge is in use.

Apart from this potential problem, I think you will find the tuning noise bridge an economical addition to your rig that will make antenna tuning both simple and efficient. ar

A TRANSCEIVER FOR EVERY BUDGET

FT-747GX BUDGET H.F. TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and (optional) FM transceiver providing 100 watts of PEP output on all 1.8-30MHz amateur bands and general coverage reception from 100kHz to 30MHz. Convenience features include a front panel mounted speaker and unobstructed digital display, dual operator selectable tuning steps for each mode, dual VFO's for split frequency operation and 20 memory channels (eighteen of which can store spilt Tx/Rx frequencies). Wideband 6kHz AM, and narrow 500Hz CW IF filters are also fitted as a standard feature. Includes MH-1 hand microphone. See ARA Review — Vol 11, Issue 11.
Cat D-2930



2 YEAR WARRANTY

SAVE $100 **$1199**

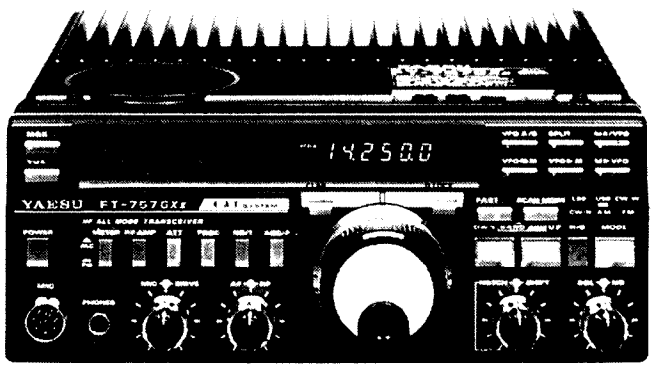
Our Most Rugged HF Mobile Transceiver!

FT-757GX II ALL MODE HF TRANSCEIVER

Ready for action! Whether in a demanding H.F. mobile situation, or at home in the shack, the FT-757GX II won't let you down.
Based on its popular predecessor, the new MK2 features the heavy duty die-cast heatsink and rugged metal chassis of the earlier 757GX, but has been substantially upgraded to offer a number of new features. These include...

- All mode operation — SSB, CW, AM, FM(160m-10m)
- 100 watt output on SSB, CW, FM (25W AM) at 100% duty cycle
- High performance general coverage receiver — 150kHz to 30MHz
- Dual VFO's with single button VFO/memory swap functions
- Memories store freq. and mode, plus allow band scanning between adjacent memories
- Inbuilt 600Hz CW IF filter, IF shift and IF notch filters, variable noise blanker, Speech Processor, iambic CW keyer, and SWR meter. Includes MH-1 hand microphone.

Cat D-3492



2 YEAR WARRANTY **$1795**

FT-767GX BASE-STATION MULTIBAND TRANSCEIVER

The FT767GX is the ONLY transceiver that offers such a high level of performance on all HF amateur bands, as well as on the 6m, 2m, and 70cm bands. Features include all amateur band coverage from 1.8 to 440MHz (100W max HF, 10W max VHF/UHF), all mode operation on all bands (SSB, CW AM, FM, FSK), HF receiver covering 100kHz to 30MHZ with up to 104dB dynamic range, inbuilt AC power supply, inbuilt automatic HF antenna tuner, digital wattmeter and auto-calculating SWR meter. Also includes hand-held MH-1 microphone.
Cat D-2935

HF, 6M, 2M, 70CM

YAESU

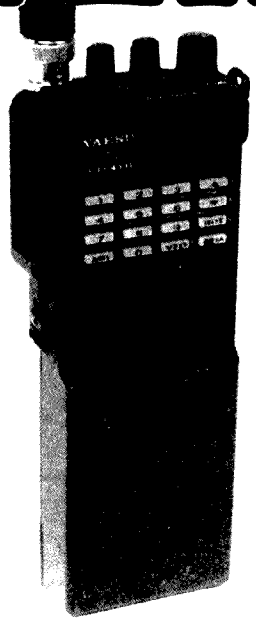
2 YEAR WARRANTY

DICK SMITH ELECTRONICS

SAVE $200 **$3495**

SPECIAL OFFER

PURCHASE ANY OF THESE YAESU HAND-HELDS THIS MONTH AND YOU CAN SAVE $49 ON A SPARE NICAD BATTERY PACK! THAT'S RIGHT, YOU CAN PURCHASE A SPARE FNB-14, 1000mA/H NICAD BATTERY (0-3351) FOR THE SUPER LOW PRICE OF JUST $50 WITH ANY OF THESE YAESU HAND-HELD TRANSCEIVERS. *THAT'S AN INCREDIBLE $49 SAVING!*



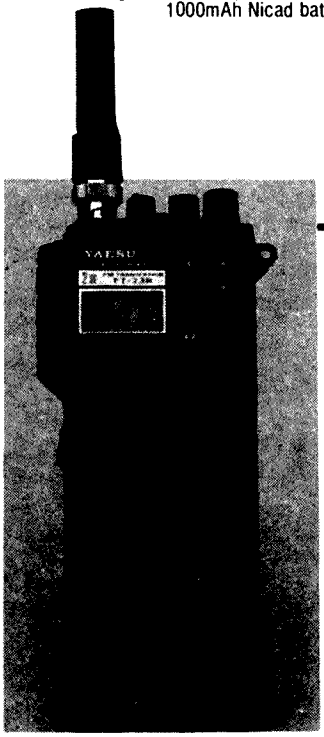
FT-411E ENHANCED 2M HAND-HELD

Our best 2m hand-held! The enhanced FT-411E now provides both improved receiver sensitivity and better rejection of out-of-band signals, whilst retaining its compact size (55x155x32mm) and ease of use.

The multi-function back-lit keypad allows fast frequency entry, plus programming of the 49 tuneable memories (and the 10 DTMF memories), setting of the programmable 'power saver' system and a host of other convenient functions.

The microprocessor control system also features 2 VFOs, top mounted rotary dial tuning in 5 selectable tuning steps, a back-lit 6 digit LCD screen with bar-graph PO/S-meter, and a range of scanning features including busy channel, band, or selective memory scanning and priority channel monitoring. VOX (Voice Operated Tx) circuitry is also provided, allowing hands-free operation with the optional YH-2 headset. The FT-411E is supplied with an ultra long-life 7.2 V 1000mAh Nicad battery pack, carry case, belt clip, 'rubber duckie' antenna and approved AC charger.

Cat D-3350



2 YEAR WARRANTY

$449

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10, 12.5, 20 & 25kHz
Supply Voltage:	5.5-15V DC
Output Power:	2.5W @ 7.2V
Current Consumption —	
Stand-by (with 1 sec. save):	7mA
Receive:	150mA
IF Frequencies:	21.4MHz, 455kHz
Sensitivity (12dB SINAD):	Better than 0.158uV

Ultra Compact

FT-23R 2M HAND-HELD

The FT-23R is an ultra-compact (just 55x139x32mm) microprocessor controlled hand-held transceiver that offers extremely rugged construction and exceptional ease of use. It covers 144-148 MHz and features include 10 memories which store frequency and repeater offset, 6 digit LCD with PO/S-meter, band/memory/priority scanning, 1MHz up/down stepping for fast QSY, repeater reverse operation, selectable tuning/scanning steps, diecast transceiver casing, FNB-10 600mAh NiCad battery pack giving 2.5 watts output and rubber gasket seals around all external controls and connectors. It comes with a mini 'rubber duckie' antenna, carry case, belt clip, and approved AC charger.

Cat D-3490

2 YEAR WARRANTY

Specifications

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10kHz, 1MHz
Supply Voltage:	6-15V DC
Current Consumption—	
Stand-by:	19mA
Receive:	150mA
Sensitivity (12db SINAD):	Better than 0.25uV

SAVE $30

$369

2m & 70cm In One!

FT-470 DUAL-BAND HAND-HELD

Dual-band performance at its best! The FT-470 is a very easy to use hand-held transceiver that offers a high degree of flexibility through the use of a sensible multi-tasking microprocessor control system to provide both 2m and 70cm operation in one compact unit.

Dual independent IF circuits allow several functions to be performed simultaneously, including dual-band reception, and full cross-band operation. The FT-470 also has 21 tuneable memories and 2 VFOs per band, plus inbuilt C.T.C.S.S. (tone squelch) with a paging facility and a wide variety of scanning functions. A back-lit LCD screen shows a 5.5 digit frequency display on both bands simultaneously and a bargraph PO/S-meter lets you know exactly what you're doing. A programmable 'power-saver' system helps maximise battery life, allowing squelched receive current of as low as 7mA. The FT-470 comes with an ultra-high capacity 7.2V 1000mAh NiCad battery pack, carry case, belt-clip, dual band antenna and approved AC charger.

Cat D-3360

2 YEAR WARRANTY **$699**

Specifications

Frequency Coverage:	144-148MHz, 430-450MHz
Output Power:	2.3W (both bands, 7.2V)
Supply Voltage:	5.5 to 15V DC
Current Consumption—	
Stand-by (with 1 sec. save):	8mA (each band)
Receive:	150mA (each band)
Sensitivity(12dB SINAD):	better than 0.158uV (both bands)
Size:	55 x 180 x 32mm

DICK SMITH ELECTRONICS

YAESU FT-1000

"The Best of the Best!"... That's what Yaesu and Dick Smith Electronics think of the FT-1000 deluxe HF all-mode transceiver. But don't believe us- read what the experts have to say...

On documentation

"clearly written and complete, and includes a complete set of schematics and many high quality photos" — QST "The quality of printing and presentation of this book is the best I have seen..." — AR

On operation

"The layout of the front panel of the FT-1000 is just right... I reckon the FT-1000 is (operationally) far less complex than either the Icom IC-781 or the Kenwood TS-950S." — ARA "...I found the FT-1000 easier to learn and use than any other radio in its class." — QST

On the receiver

"On receive, the performance was often beyond the limit of the latest professional measuring equipment, with no measurable trace whatsoever of synthesizer phase noise." — PW "...this rig has a very strong receiver; it has the best overall performance (in terms of sensitivity and dynamic range) and the highest third order input intercept of any commercial radio ever tested in the ARRL lab." — QST* "The direct digital synthesizer works very well and produces receiver performance that sets new standards." — AR "I found the receiver in the FT-1000 to be astonishingly sensitive and immune to cross modulation on all bands." — ARA

Transmitter — SSB

"In SSB operation, the FT-1000 is easy to adjust and use... The processor adds quite a bit of punch to SSB signals; hams I worked on SSB with the FT-1000 gave me good audio quality reports." — QST "Reports were all very favourable, especially when using the speech processor." — AR "...reports of my transmitted audio were very good, even with the RF processor turned up..." — PW

Transmitter — CW

"CW keying was a delight...power output was checked in the CW mode and found to be well in excess of 200 watts on all bands..." — AR "On CW the FT-1000 was absolutely faultless." — ARA "CW operation with the internal keyer is a breeze... In QSK CW operation, the rig has well shaped and weighted keying." — QST

Transmitter — RTTY/Packet

"Using the set on HF packet was an absolute pleasure..." — PW "RTTY and packet radio operation with the '1000 are straight forward..." — QST "Packet and RTTY modes were tried and proved just superb." — ARA

Conclusion

"Yaesu's latest 'Flagship' transceiver clearly lives up to its name..." — PW "...the FT-1000 represents unbeatable value..." — AR "It is an excellent set worthy of accolades and rave." — ARA "...the FT-1000 needs little for me to consider it the ultimate contesting and DXing machine available today..." — QST*

The FT-1000's combination of Direct Digital Synthesis, high output power, ultra-high performance receiver, and easy to use controls put it far ahead of the competition. Wouldn't you rather be using the "Best of the Best"?

Cat D-3200

2 YEAR WARRANTY

$4995

including MD-1 desk mic

Magazines

ARA — Amateur Radio Action Vol. 13, No. 2
AR — Amateur Radio August 1990
PW — Practical Wireless January 1990
QST — ARRL QST March 1991 *(review with optional filters fitted)

Copies of these and other reviews plus our 12 page colour brochure are available upon request. Phone (008) 226610 or (02) 8882105.

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VHF/UHF BASE STATION ANTENNAS

These high quality, vertically polarised base station antennas are ideal for the discerning Amateur operating on the 2m, 70cm or 23cm bands. They're beautifully constructed Diamond brand antennas from Japan and provide high gain for maximum range. Constructed from robust F.R.P. tubing for excellent all-weather operation, with ground-plane radials for a clean radiation pattern.

2m ANTENNA F23A

Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x $\frac{5}{8}\lambda$ co-linear
Cat D-4850

$199

2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x $\frac{5}{8}\lambda$(2m), 4 x $\frac{5}{8}\lambda$(70cm)
Cat D-4860

$199

23cm ANTENNA F-1230A

Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
Length: 3.06m
Type: 25 x $\frac{1}{2}\lambda$ co-linear
Cat D-4870

Limited Stocks!

$249

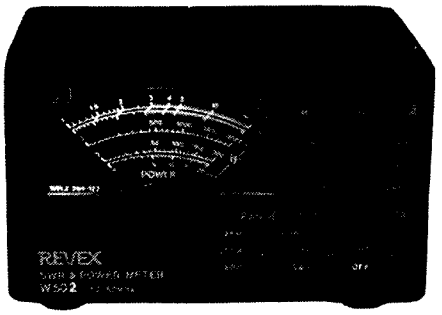
2m ½ WAVE BASE STATION ANTENNA

An outstanding value for money, compact, Australian made base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection and comes with a 5 year warranty.

Cat D-4820

—MOBILE ONE

$49.95

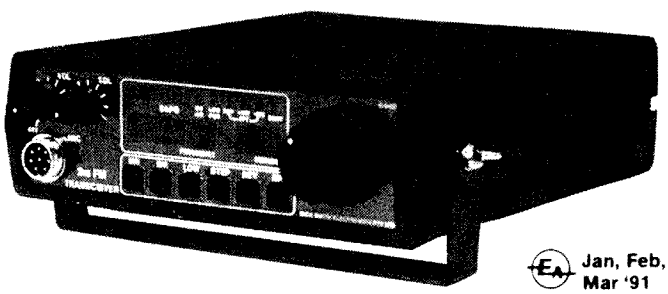


HF/6m POWER/SWR METER

$199

A superb wideband SWR/Power meter which boasts quality Japanese construction and a truly accurate P.E.P. metering circuit (unlike many 'other' so called P.E.P. monitor systems). The Revex W502 features solid construction with an all-metal case and a large back-lit meter... and it covers the 1.8 to 60MHz range with less than 0.1dB insertion loss. With 20W, 200W and 2kW power ranges and LED indicators which show average or P.E.P. operation. Requires 13.8V DC @ 200mA power supply.

Cat D-1360



EA Jan, Feb, Mar '91

2m FM TRANSCEIVER KIT

This outstanding high performance FM transceiver can be used as either a mobile or base station on the 144-148MHz amateur band. It must be one of the easiest transceivers of its kind to build yet it comes loaded with advanced features.

Features like:

- Full PLL frequency synthesis
- 24 memory channels which store repeater shifts
- 25W or 5W switchable output
- 5kHz and 25kHz tuning steps
- Microprocessor control system
- Excessive SWR safety shut-down circuitry
- 0.15uV typical sensitivity at 12dB SINAD
- 30kHz selectivity at -60dB
- -60dB image rejection

NEW '91

At this price you can afford to take the challenge! Kit includes all components, hardware, heatsink, detailed construction and testing information, and a pre-punched silk screened front panel. Microphone is not supplied. YAESU D-2110 or D-2105 are recommended.

Cat K-6400

Only $399

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CONTESTS

(INFORMATION PROVIDED BY THE RELEVANT CONTEST MANAGERS)

John Moyle Memorial Field Day Contest 1991 Results

PHILIP RAYNER VK1PJ
JOHN MOYLE CONTEST MANAGER

Results of the John Moyle Memorial Field Day Contest held on the weekend of 16-17 March 1991 have now been compiled. On behalf of the WIA, congratulations are extended to the winners in each section. Commiserations to those who made contacts but did not enter their log.

In the following list of logs received, an asterisk indicates the winners of certificates:

Results

24-Hour Home Station, Multi Op, Phone, All Band

VK4SEA	350

24-Hour Home Station, Single Op, Phone, HF

VK3CAY	108
VK4QI	89
VK3ENX	43

24-Hour Home Station, Single Op, Phone, All Band

VK4SSB	600
VK3DD	141
VK5ATQ	32
VK4EV	26

24-Hour Portable Station, Multi Op, Open HF

VK6PM	130*

24-Hour Portable Station, Multi Op, Open, All Band

VK6ANC	2164*
VK4WIS	1854
VK5ARC	1036
VK4WIT	598

24-Hour Portable Station, Multi Op, Phone, HF

VK4CHB	840*
VK2WO	654
VK4WIR	146

24-Hour Portable Station, Multi Op, Phone, All Band

VK4WIE	4168*
VK4IZ	3810
VK1ACA	3512
VK3ATL	3056
VK3ANR	1476
VK3GH	1470
VK3BCG	1074
VK3BML	924
VK2FFG	856
VK3BEZ	660
VK2APW	500
VK1ZX	348
VK5BP	280

24-Hour Portable Station, Single Op, Open, HF

VK4OR	560*
VK3CFI	88

24-Hour Portable Station, Single Op, Phone, HF

VK5CN	366*

24-Hour Portable Station, Single Op, Phone, All Band

VK4IY	570*
VK4MCY	534
VK5ABS	272
VK4VR	150
VK6JIP	44

24-Hour Portable Station, Single Op, Phone, VHF/UHF

VK2EZF	514*
VK4ZXZ	148
VK4RX	70
VK4BAW	52
VK4ANN	42
VK4GUY	28
VK4KAC	24

6-Hour Home Station, Single Op, Open, HF

VK3AOR	142

6-Hour Home Station, Single Op, Phone, HF

VK1KRC	195

6-Hour Portable Station, Multi Op, Open, All Band

VK4WIN	524*
VK5BAR	264

6-Hour Portable Station, Multi Op, Phone, HF

VK2CKB	208*
VK4WIW	196
VK4WIM	128
VK5LZ	80

6-Hour Portable Station, Single Op, CW, HF

VK3EFO	32* Trophy

6-Hour Portable Station, Single Op, Open, HF

VK2EL	84*

6-Hour Portable Station, Single Op, Phone, HF

VK4YB	518*
VK3OM	76
VK6BEB	26

6-Hour Portable Station, Single Op, Phone, All Band

VK5GN	532*
VK3HZ	290
VK4AIZ	290
VK4ACL	236

6-Hour Portable Station, Single Op, Phone, VHF/UHF

VK2DXV	226*
VK4ZWB	6

Six-Hour Home Station, Receiving, Phone, HF

William Yates	113
Check Log VK4OD	

Operators' Comments

VK1ZX - While you will not get two hams to agree on the rules, you must have had some measure of success for it seemed to me that there was a greater number of field stations active than in the past couple of years.

VK2WO - A good time was had by all; however, did not enter morse CW section as there was insufficient loading on points for CW contacts to make this viable - something to look at for next year. *(See comments about CW)*

VK3AOR - New rules should encourage participation by more multi-op portable stations - a good move. Next year, I'll be out there; generator blown up this year.

VK3CFI - I wish I had entered the ALL bands section. I managed to contact both U2MIR and U9MIR on two-watts output with handheld transceiver and rubber duck antenna. At 2000km they would have given me 30 points each. *(But, were they portable?)*

VK3ENX I realise that my score is very low, but this is the first contest I have had the confidence to enter. My feelings now are that contests are great fun and I will certainly be involved next year. *(Congratulations, glad that you tried another aspect of the hobby)*

VK4IZ - Had a really fun time as always and a great way to introduce those doing classes to amateur radio.

VK4OR - An enjoyable contest and camping time. Delightful weather. At 11am on Sunday, almost all the club stations had done their 24 hours and disappeared. The bands went very dead. I had a lot of trouble getting QSOs in the last hour (I started just after midday on Saturday). I don't know how the late-comers got on who were going to do a six-hour burst, because they would miss out on all the club portable stations. Perhaps there weren't any doing it. *(What about contest period being 0200 Saturday to 0159 Sunday?)*

VK4WIR - I feel that this contest was much friendlier than previous years. No bonus points for solar power etc helps even out the scores.

VK5ABS - As the contest is to test how efficient the equipment is, contacts only allowable by field stations should be other field stations.

VK5ATQ - Good fun; first contest for many years for me. Did not plan on entering, just heard some calls and gave replies. Heard some VK3s on 2m SSB, so must develop some better gear for next year.

Contest Manager's Comments

I would like to explain what I consider the purpose of this contest. As the aim states, the contest is intended to help amateurs to become familiar with portable operation and thus assist in training them for emergency situations. I compare the JM to a communications exercise where a central control station, namely the multi-operator or club station, has access to all modes and bands of operation to control and provide a communication path between single operator stations on any one band or mode who may be co-located with emergency service field staff.

I have said that the rules as printed in January 1991 *AR* should not be changed for at least three years so that continuity would exist and entrants would know where they were. Unfortunately, a few queries were raised and, therefore, the rules may need fine tuning and I would like to explain what the queries were and where the changes may be required. Comments on these rule changes would be appreciated.

How is massive logistic support assessed?

In our hobby, support can be provided to a station without the support being physically present. By example, what can be termed massive logistic support from afar is where one operator uses a club callsign and upwards of 13 club members and friends operate from another site more than 150 kilometres away on VHF and UHF, thus obtaining 30 points for each contact. The members like clockwork contact their own club call in an obviously biased manner. This can only be seen as providing massive logistic support. A club which operated in this manner has now withdrawn its entry, much to my satisfaction, as a complaint was received from another contestant of which follow-up investigation confirmed the unspirited and biased operation. Whilst the supporting members' entries could have been disqualified, I have left them in, but have subtracted the points for which they had contacted the club callsign.

You may also say that assistance with the setting up of a single operator could be classed as massive logistic support. My idea of allowing this was to assist the inexperienced, elderly or incapacitated to join in and be portable in the contest. The JM could also encourage other family members and friends to assist with antenna raising, log keeping, food and drink making. This would not alienate them and may encourage their participation in our hobby.

The rule change to overcome the above problem would be to make multiple operator entrants use all mode, all band and be portable.

This would then raise the problem of the next query being that a multi-operator station which entered the HF section did not make any CW contacts as there was insufficient loading on points for CW contacts to make it viable. Maybe where a station enters the open mode section and works CW then those contacts on CW should be higher than those worked on SSB. I think that a rider should be added to ensure that there is a certain percentage of contacts made on CW for this to function properly. We must remember that we cannot compare a station working only CW to a station working only SSB, as these two stations are not competing with each other, therefore there is no reason why the station working CW should be given higher points. You tell me what you want!

Lack of VK CW activity - there were heaps of VK CW operators in the Commonwealth Test last week.

Maybe encouraging the family to assist and take an interest in contests would allow operators to work both contests on consecutive weekends.

Why can't the repeat time of working ZL stations be the same, ie hourly?

Unless the ZLs also work the 20, 15 and 10m bands, which is most unlikely, hourly repeats give the eastern states an unfair advantage over the western states. While the eastern states can contact ZLs easily on 80 and 40m, the VK6s cannot hear them. The three-hourly repeat contact rule was added to allow far more operation for all entrants. Please keep in mind that the repeat time starts from the last valid contact which may not necessarily be the very last contact you made with that station.

There seems to be some misunderstanding regarding operators from multi-operator stations, when not on duty, contacting the multi-operator stations under their own callsign.

I liken this type of activity to a member of a relay race helping a teammate to the next handover point. If one was to do this in any other sport of activity unless actually stated that it was permitted, the whole team would be disqualified. Surely I do not have to spell it out for you. This year all points for such contacts were deducted from the multi-operator stations' points.

I would appreciate any further comments you have regarding the above points raised, or any you may feel need attention. Thank you for being part of the 1991 John Moyle contest. See you all next year. **ar**

Magazine Review

D-I-Y Radio

Christine Russell

RSGB has published a new amateur radio magazine for beginners of all ages called *D-I-Y- Radio*.

A construction guide, including diagrams of the circuit and construction of the key, is given for a morse key and buzzer. I would think this is a good start in learning practical construction techniques; even a novice candidate like myself could understand and follow it.

Hints and Tips on Soldering: I read this article and the step by step instructions made it seem so easy I'm going to have to try this soldering caper myself.

A comprehensive "how to" for Amateur Radio Direction Finding (Fox Hunt). Quite interesting. I've heard of fox hunting, but I wasn't sure how you would find the hidden transmitters. Easy for all ages to understand. No technical overload involved.

Readers from a wide age spectrum are excited about this magazine as I discovered after reading "Letters to the Editor".

This is an ideal magazine for children too, with a free poster included entitled "Amateur Radio - The Space Age Hobby".

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Murphy's Corner

Errata August Issue

Just when we thought he was firmly under control, Murphy decided to strike back with a vengeance. His selected victim was Clive Cooke VK4CC, whose interesting VK Caltenna article was corrupted.

In the first place we misspelt Clive's surname - leaving the 'e' off the end.

In figures 1 and 2, the captions are correct, but the figures themselves have been transposed. Of the four circuit diagrams, all except that presented as figure 1 have had their coaxial connections transposed. The centre conductor in these three diagrams should each be connected to the winding centre tap.

The formula halfway down column 1 P 10, shown as A=B*C should have read $A=\sqrt{(B*C)}$.

On the top of column 2, page 9, the bandwidth should have been 500kHz, not 50 as shown. Same page, top of column 3 - the impedance of free space should have read 120π ohms.

Apologies to Clive for these unfortunate errors.

ar

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO Box 169, MENINGIE 5264

All times are UTC

Six-Metre Beacons

Freq	Callsign	Location	Grid Square
50.000	GB3BUX	England	I073
50.005	H44HIR	Honiara	QI00
50.005	HL9TG	Korea	PM37
50.005	ZS2SIX	South Africa	KF25
50.011	JA2IGY	Japan	PM84
50.015	SZ2DH	Greece	KM18
50.017	JA6YBR	Japan	PM51
50.020	GB3SIX	England	IO73
50.020	CX1CCC	Uruguay	
50.025	6Y5RC	Jamaica	FK17
50.025	OH1VR	Finland	KP12
50.027	9H1SIX	Malta	JM75
50.028	JA7ZMA	Japan	QM07
50.029	CT0WW	Portugal	IN61
50.032	ZD8VHF	Ascension Island	II22
50.032	ZS5SIX	South Africa	KG50
50.035	ZB2VHF	Gibraltar	IM76
50.035	ZS3VHF	South Africa	JG87
50.035	V73AT	Marshall Is	RJ38
50.039	FY7THF	French Guyana	GJ35
50.041	FO5DR	Tahiti	BH52
50.045	OX3VHF	Greenland	GP60
50.048	TG4BFK	Guatemala	
50.050	GB3NHQ	England	IO91
50.050	ZS6DN	South Africa	KG44
50.051	LA7SIX	Norway	JP99
50.054	VK3SIX	Hamilton	QF02
50.056	VK8VF	Darwin	PH57
50.057	TF3SIX	Iceland	HP94
50.062	PY2AA	Brazil	GG66
50.064	WD7Z	Arizona	EL59
50.065	GJ4HXJ	England	IN89
50.065	NB30/1	Rhode Island	FN41
50.066	VK4RPH	Perth	OF78
50.063	KH6HI	Hawaii	BL01
50.075	VS6SIX	Hong Kong	OL72
50.078	TI2NA	Costa Rica	EK70
50.080	KH6JJK	Hawaii	BL11
50.080	HC8SIX	Galapagos Is	EI59
50.080	SK6SIX	Sweden	JO57
50.086	VP2MO	Montserrat	FK86
50.088	VE1SIX	Canada	FN65
50.090	KJ6BZ	Johnston Island	AK56
50.091	9L1US	Sierra Leone	IJ38
50.092	W5GTP	Louisiana USA	EM40
50.099	KP4EKG	Puerto Rico	FK68
50.100	HC2FG	Ecuador	FI07
50.100	5H1HK	Tanzania	
50.110	KG6DX	Guam	QK23
50.110	A61XL	Un Arab Emir	LL74
50 120	4S7EA	Sri Lanka	MJ97
50.321	ZS5SIX	South Africa	KG50
50.490	JG1ZGW	Tokyo	PM95
50.499	5B4CY	Cyprus	KM54
51.020	ZL1UHF	Auckland	RF73
52.100	ZK2SIX	Niue	AH50
52.200	VK8VF	Darwin	PH57
52.310	ZL3MHF	Christchurch	RE66
52.320	VK6RTT	Wickham	OG89
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.465	VK6RTW	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
52.510	ZL2MHF	Mount Climie	RE78

Frank Sleep VK4CAU advises that the Rockhampton beacon on 432.540 is not operational at present.

Peter VK3AWY reports that the Geelong six and two-metre beacons are being shifted to Mount Anakie QF22, the site of the 2m and 70cm repeaters. They should be operational by the time this is read. Both beacons will have their callsigns changed from VK3RGG to VK3RGL, thus all amateur equipment on Mount Anakie will have a common callsign.

Ron VK4BRG writes that 3D2 is considering a 6m beacon, to the extent that a callsign has been allocated.

A correction to the August Six Metres Standings List. Steve VK3OT is shown as having worked 81 countries. This should read 79 - my error!

Six Metres

Six metres has been quite with the occasional winter Es opening to VK2 and VK4 and TEP to Japan.

However, on 26/7 Steve VK3OT noted much TV activity below 50MHz at the same time as an opening to Japan. This was passed on to Peter VK8ZLX, who subsequently called CQ and, at 0914, was answered by BY4YB in China! Signal reports of 5x5 each way were exchanged. Peter says that information from JG2BRI indicates that there are three stations licensed in Taiwan, BV2DP, BV2WA/1, JP1AIW/BV1 and huge dogpiles from all JA districts have been working the BV stations via Es.

Sarina Reports

Ron VK4BRG reports 6m as being relatively quiet. He heard nothing of the Mongolian DXpedition, but did hear the KC6MR beacon on 14/6 at 0052. Despite an S9 signal, Ron was unable to make contact. 24/5: 2215 FK8EB weak scatter; 31/5, 1/6: 2357 V73AT. 4/6: 0803 KH6IAA, 0811 KH6HH, 0902 KH6JEB/KH7 - with digital voice CQ machine on 50.120; 8/6: 2310 KG6DX; 10/6: 0200 to 0530 - extensive Es and working VK1 to VK8 and ZL. VK2ZXC reported working VK9YQS and FK8EB. 13/6: 2155 ZL1BHV via scatter, 2157 3D2PO direct either F2 or Es, 2204 ZL2TPY via weak scatter; 15/6: 0818 N16E/KH6 via TEP; 16/6: 0508 to 0526 ZL2TIC, ZL3ADT, ZL3TY, 0757 KH6IAA, 0841 NI6E/KH7.

Tasmania

We hear little from Tasmania, so thanks to Maurice VK7SA for letting us know a little of 6m. 20/4: VK7ZMF and VK7ZBA worked W5GVE at 2384; 21/4: VK7ZMF worked XE1GRR and XE1GE at 2342; 28/4: VK7SA and other VK7s worked P29PL and P29ZGD at 0005, 0047 to 3D2CM, from 0245 good JA opening to all districts; 29/4: Good JA Opening to VK7s, RR, ZIF, JWR, SA and others. Little else to report.

From the UK

Ken Ellis G5KW reports from his column in *HRT* magazine that Max IK8HIO is active as IG9/IK8HIO in JM65. QSL via IK8IUT.

CE8ABF has promised to run a keyer on 50.007 when the band is quiet.

Lucien FM5WD on Martinique requests that 6m QSLs should be sent to him direct.

Steve ZB0X from Gibraltar is active on 6m.

George Galea on Malta was 9H5AA but is now 9H1AA.

A new beacon UL8GDD, has been activated from within the USSR, with five watts on 50.055, locator MN83. However, Ken G5KW questions the legality of this station.

The Norwegian beacon LA7SIX on 50.050 runs 25 watts to a four-element Yagi beaming 190 degrees.

As at 31/5/91 no 6m permits have been issued in EA, YU or SP, despite a number being active on 6m.

Recently, YO2IS in Romania managed to assemble a 6m station from junk parts, and in a short period had worked more than 30 countries!

Mongolia

It all started when Ray VK3LK called CQ at 0830 on 3/6 and was answered by JA1OEM who asked him to QSY from 50.110.

Steve VK3OT was listening and called JU1JA (the Mongolian DXpedition) on 50.150, who had previously reported hearing the VK3SIX beacon between 0105 and 0130. The DXpedition was supposed to call on 50.125, but nothing heard. It transpires that the split operation was 50.115 to 50.165. Steve remarked, "Oh well, you've got to try and sometimes you make it. But at least the beacon was heard in Mongolia."

All is not lost because JA1MVK has donated a 6m rig to JT1CO who will be a permanent operator from Ulan Bator.

DXCC from G-Land

G5KW has sent a copy of the RSGB 50MHz

Countries Award for 100 confirmed countries by Geoff Brown GJ4ICD. This is award number one and is dated 31 July 1990.

On the same subject there is an interesting paragraph from Steve VK3OT in July *ARA*, and reproduced with his permission:

"The following list shows the invalid stations for DXCC - EA, EA8, YU, EA9, 3X1, Y22, HA, OK, EA6, SV9, SV5, 4X4, YV0 and now DL.

"To work 100 countries you can get these, all worked this cycle in Europe. A22, CE, CO, CN, CT1, CT3, CU CX, C5, DL, DU, D44, EI, EL, F, FP, FR, FY, G, GJ, GM, GU, GW, HB9, HB0, HC, HC8, HH, HI, HZ, HK, HP, HR, HV, I, IS0, IT9, JA, J37, J52, KG6, KG4, KP2, LA, LU, LX, OA, OE, OH, OH0M, ON, OX, OY, OZ, PA, PJ9, PZ, P43, SM, SV, TF, TI, TK, TR, TU, T77, VE, VK, VP2E, VP2V, VP5, VP9, VS6, V29, V31, V47, W, YN, YO, YV, ZB, ZC4, ZD8, ZF, ZS, V51, Z23, PY0, 1A0, 3DA, 4U1, 5B4, 5H1, 5NO, 6W1, 7Q7, 7X, 8P6, 8R1, 9H, 9J2, 9L1, 9Q5, 9Y4, 8Q7, C6 and ZS9.

"So, don't despair - there's hope for us yet!"

Walvis Bay

An interesting snare for a limited number of VK stations was ZS9A in Walvis Bay on 19/4 around 0740. This is a tiny country right on the west coast of Africa and adjacent to Namibia, and was available during one of the openings to southern Africa. I think it was a surprise for those involved to find that it was a separate country.

On Higher Bands

On the Adelaide scene, in particular, there has been a flurry of activity to upgrade equipment and antennas on 432MHz. The K1FO version of the Yagi has been singularly successful in improving results for some stations. VK5LP found it to be even better than the former gold-plated 16-element KLM which saw many years service!

The next obvious step was 1296MHz and currently stations operating around Adelaide are VK5s KK, AKM, AKK, ZLJ, EME, KEV, QR and LP. Those capable of operating on either FM or SSB, but not being heard, include VK5s HY, KRW, ZRO, AVQ, AGG, WA, AIM, ZDV, ZAV, ZRG and ZMJ. VK5RO is showing an interest! VK5EME is Mark, formerly VK5ZMK.

On 2304MHz are to be found VK5KK and VK5AKM, each with 23-element loop Yagis - they were the first of the group to try the band; VK5EME and VK5ZLJ use 52-element loop Yagis, which are an upgrade from the original "Figure 8" solid state antennas. Each station runs about half a watt with spectacular results.

VK5KK and VK5AKM tried the band some time ago with limited results. The present activity commenced on 9/7 with marginal signals between VK5AKM and VK5EME over a 30km path. On 11/7 VK5EME came on with his 52-element loop Yagi and was immediately received by VK5AKM at 5x4. At the same time David VK5KK operated portable from Houghton in the Adelaide hills, and 5x9 signals both ways were exchanged with Keith VK5AKM and Mark VK5EME. However, from his less than helpful home QTH David could only manage 5x1 with VK5EME.

With gradual upgrading of equipment signals improved so that extended tests between VK5EME and VK5AKM saw signals at 5x4 on 14/7, 5x6 on 15/7 and 5x9 on 16/7 and 17/7, but still 5x1 to VK5KK. Ron VK5ZLJ now joined the scene and exchanged 5x9 signals with VK5AKM on 16, 17, 18, 19, 20 and 21/7 over a 60km path. At times the signals were peaking to 50dB over S9! All this with half a watt! Signals on 1296 around the same times were usually 5x9. Mark VK5EME suggested that there are periods of obvious enhancement assisting 2304MHz, as signals under more normal conditions usually average around 5x8. Signals have been mostly SSB, but FM has been tried with similar results.

All the above activity means that when conditions are right, Wally VK6WG in Albany, that doyen of UHF operating, may suddenly find a dogpile on 2304MHz. It will be interesting to see what happens around the end of January when conditions generally favour UHF operating.

On 3456MHz SSB can be found VK5QR, VK5KK and VK5AKM with VK5NY in the future.

Much credit for the sudden interest in SSB on 2304 and 3456MHz is due to the efforts of David VK5KK, who has prepared a series of kits which can be readily assembled and apparently proving very popular.

ATV on 10GHz

From Rockhampton, Frank Sleep VK4CAU writes to say he has been encouraged by results with ATV on 10GHz, with displays being given at local schools during hobby festivals and fetes.

The recent purchase of a colour 12-volt camera has allowed freedom from mains power and thus to extend the range from the usual 10 to 20 metres to 100 metres at a recent display at the Rockhampton High School. Liaison between the camera/transmitter and the television was by the sound channel on the TV, one way and two metres the other. The IF used was Channel 4 on the TV (about 98MHz) with the RF being fed directly into the TV. No FM to AM conversion was used; the "slope detection" by the TV produced excellent results, as per the Gunnplexer Cook Book, written by Bob Richardson W4UCH.

Frank will try some pre-emphasis to the video in an effort to produce even better results. Future experiments on 10GHz will be into NBFM with five to 15kHz deviation. Thanks for the news, Frank.

Aircraft Enhancement

This form of propagation continues to draw its loyal band of followers. Roger VK3XRS from Sarsfield, about four kilometres north of Bairnsdale and 240 kilometres east of Melbourne, reports that on 31/5 on 144.200 he worked VK1BG and VK1VP; 1/6: VK1VP, VK1BG, VK1AU plus VK1BG (432.200). 14/6: VK2ZAB and VK1VP (432). 15/6: VK1AU, VK1BG. 21/28/6: VK1AU, VK1BG, 29/6: VK1AU and heard VK2ZAB, VK3UM, VK3DUT, VK3AUG, VK3AFW, VK2ZRE, VK1VP. Times are between 2210 and 2240.

Included in the log for normal working were VK3AUG on 144 on 31/5; VK3ZJC on 432 on 16/6 and FM carriers heard both ways on 1296; 22/6 VK3KSD on 144; 3/7 Andrew VK7ZHA on 144 and 432 at 5x9 both ways on SSB and FM.

Roger works Andrew most mornings of the week around 2215 on SSB with signals to 5x9; Andrew about the same time usually works Ron VK3AFW on CW.

Roger VK3XRS says his 1296MHz station is taking shape with the installation of a 2C39 water-cooled cavity and the reaction of a 2m-diameter dish. Contacts this year have been made with VK3ZBJ, VK3YTV, VK3ZJC, VK3KKW, VK3BBU and VK7ZAP. On 432MHz he was pleased to have a contact with Wally VK6WG in Albany on 31/3 with signals 5x6 and a path distance on 2 671.8km. Roger uses a DL6WU 34-element Yagi on a 9m boom, Yaesu 726R and 130 watt linear plus GaAs FET pre-amplifier.

Late Items

Noticed in the Japanese "CQ ham radio" (courtesy VK6RO) a reproduced QSL to JR6WPT from TL8MB in the Central African Republic of Bangul. This could be a nice catch for a lucky VK station browsing around six metres!

It has been tentatively reported that the PNG beacon P29BPL is now on 50.020. In April it was still being reported as heard in Japan on 52.012, but it has not been heard in VK5 for a long time.

This month's information is a bit "chop and change" but has covered a variety of subjects. I decided against mulling over somewhat dated 6m contacts - that band has been given plenty of mileage lately.

Closure

The spring equinox will soon be here. Keep in mind to look predominantly towards the east from the early mornings (local time), northwards later in the day, west to Africa from late afternoon, and to Europe from early evening. JAs will be around at odd hours right through to midnight local time!

Two thoughts for the month: "Sport is the toy department of the human life" and "If you think nobody cares if you're alive, try missing a couple of car payments"!

73 from The Voice by the Lake

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HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93, DURAL 2158

Somebody once said that the age of the amateur DX operator shows immediately when he or she starts using the phonetic alphabet for the callsigns or for spelling difficult words. Among the new generation DXers, there are some who do not use phonetics at all, relying completely on the pronunciation of the letters and believing that the rest of the world (90%), whose native language is not English, will understand them. There are others who, for some psychological reasons, want to be smart, flamboyant, clever(?) - call it what you will - who use phonetics like: big sugar daddy for the letters: BSD, or similar absurdities. Do you really believe that such poor operating skill does enhance our image in the eyes of our fellow amateurs who are not DXers? Among the generations of the post-war amateurs, some still use the phonetics of the names of various countries as recommended in the 1944 edition of the *RSGB Amateur Radio Handbook*, page 280, or use the system of various first names as they appear in the *1950 ARRL Amateur Handbook*, page 525. I know of a well-known DXer who is always deaf when the callsigns are not spelled out phonetically in the correct way. So, let's make a resolution: you and I and all the other DXers: use the phonetic alphabet as recommended by the ITU radio regulations, in which the "W" is whisky, not William.

Albania - ZA

For the past 12 months the possibility of a DXpedition to Albania was a constant on-again off-again affair. The possibility of such an expedition was somehow always connected with Hungarian radio amateurs. The first news about - yet again - a new group spread on the various nets on 28 July. Janos HA0NNN, Istvan HA0DU and Gyozo HO0MM will operate from ZA. The first pirates appeared at the same time, signing a variety of combinations of a future call. Hearing the news, I immediately telephoned my sources in Hungary, and it was confirmed from there that the news was correct. This is the picture: The DXpedition is a private enterprise action, not the one which is still in the melting pot by the Hungarian and Albanian radio amateur societies. The expedition is connected with a church welfare relief mission group going to Albania from Hungary. The intending DXpeditioners promised to help the welfare group financially, and hope that in return the respective authorities will allow them to operate. At the time of writing this, at the end of the first week in August, they are supposed to be on the bands and intend to operate for 15 days. They will use the usual DX frequencies, and will operate CW, SSB and possibly RTTY.

There will be computer logging which will prevent duplicates, including crossband, and they ask the DXers not to make "insurance" contacts. The expeditioners are eager to receive donations, but only after "the job has been done". So, if you worked them and you are sure about their identity, then send your card and your donation to: Quick Aid Foundation, PO Box 5, Komoro 4622, Hungary. Cross your fingers and hope to beat the dogpile.

Pagalu (Annabon) Island - 3C0CW

August was a bumper month for new DX contacts. As reported briefly in July *AR*, EA3CUU and the Radio Club of Garrotxa (Spain) were arranging a DXpedition to this remote island off the west coast of Africa, 1°5' south latitude and 5°6' east longitude, sunrise is at 0538 and sunset at 1740. It was announced by EA3CWK at the beginning of August that the 10-day expedition will start 5 August on the usual CW, SSB, DX frequencies, including the WARC bands. They also promised to be on at least two international DX nets. Hope for the best.

St Paul's Rock - CY9CWI

This operation was a short one (see July *AR)* from 2-7 August. Whilst they had a strong signal to VK and ZL, it was very difficult to overcome the signal of the North Americans who worked them constantly. QSL to club station: VE2CWI.

Afghanistan - YA - T6AS

The Italian DXpedition to Afghanistan became a reality, not on 12 July as planned, but some days later. They were very active, and had a strong signal to VK on the shortpath on 21 July on CW for only short periods. It was difficult to work them with 100 watts and average beam from here; however, the European stations had a ball. According to various sources, they were ordered out of the country on 22 July. QSL to: IT9ASZ - Dr Salvatore Alescio, via Corso La Masa 67, I-90019 Trabia PA, Italy.

South Sandwich Islands - VP8

Last month I was happy to report to you that the DXpedition is on target to commence on 5 November. This month brings the sad news from AA6BB that the expedition has been delayed until 2 or 9 March next year. The scientific members of the expedition and the captain of the ship believe that the ice surrounding the island will be much friendlier in March next year.

DX on 160 and 80 Metres

If you listen on the 160m band late in the evenings, VK2 local time, you will find a small group of "top band" DX enthusiasts active on the upper edge of the DX portion of the band. Roger VK4YB has sent me a note about the activities of this small group. The 160m band is still able to provide reliable DX, despite the peak of the sunspot cycle and recent solar activity - writes Roger. The SEANCE net - South East Australia North America Communications Exchange - meets daily on 1832kHz at 1100 UTC from mid-May to mid-August. Up till July, they had 59 sessions with 681 check-ins, including 179 from North America. Only five sessions have failed to provide any two-way contacts with North America, which represents a 91.5 per cent path reliability. "We would like to hear more Pacific DX on the frequency, but so far only C21, FK8 and YJ0 have joined us," says Roger.

Bill VK2CWG is very active on the DX window of the 80m band. The activity on this band centres around the 3795-3800kHz segment of the band. In the month of July, Bill and his friends worked the following prefixes: US call areas 1 to 7, LU, P29, HK, OA, V73, UA0, 9V1, FK8, VE1, JA1, VE7, 3D2, VY2, OZ, H44, ZL, FO and V63. South America is expected to come alive in August; October will see a shortpath opening to Europe around 1400 UTC and 2030 UTC. From September, India can be worked around 1400 UTC or 2030 UTC between the 3.600-3.699MHz band segment.

"There is a longpath opening to CT2, CT3, CN and EA9 around 0650 UTC before our sunset," writes Bill.

So there you are. Is the 20m band crowded? Go and try 160 or 80 metres. All you need is an average transceiver, a good antenna, which implies that you should have a "bit of space" around the house to put up your long wires, dipoles, v-beams or an experimental antenna of your choice.

The ARRL DXCC Listing

Austin VK5WO has sent me the annual listing of the DX Century Club awards which was published in the June issue of *QST*. At that time there were 324 current countries on the list. The details following contain the callsign and country totals as at 30 September 1990. Mixed top VKs 300 countries plus: VK4QM 364, VK3YL 355, VK5WO 349, VK6DH 339 and VK6HD 337. Phone top VKs: VK6RU 367, VK5MS 362, VK4QM 349, VK5WO 346, VK6HD 337, VK6LK 336 and VK9NS 311. Highest CW: VK6HD 285. Top stations on phone: TI2HP 371, ZL1HY 371 and W2BXA 371. Top station on mixed: W1GKK 375. Top stations on CW: K6GA 327 and W9KNI 327.

The Voice of the Himalayas - 9N1MM

In my column in the July issue of *Amateur*

Radio, I mentioned briefly that Father Moran celebrated his 85th birthday on 29 May. Who is this Father Moran who, after a heavy day of teaching and administrative work, sits down to his old-style transceiver high up in the Himalayas, in the kingdom of Nepal, and comes on the air to chat with his American friends or with anyone who happens to be around? "This is 9NI Mickey Mouse," he announces around 1200 UTC, and the calls come in.

After exchanges of letters between us two, an interesting little picture emerges of this remarkable radio amateur.

Father Marshall D Moran is a Jesuit priest in Nepal, where he is the principal of St Xavier's school Godavari in Kathmandu. He grew up in the Chicago area of the USA. His first taste of radio came at the age of 12 when he learned to make radio receivers from a school friend. He became a short-wave listener in 1918, and never lost his interest in amateur radio since. As a young 23-year-old priest, he travelled to India in 1929 where he later became the principal of the St Xavier school in Patna, in the eastern Indian province of Bihar. Father Moran spent 20 years in India, and he was active on the pre-war and post-war bands as VU2SX. In 1951 he decided that he would establish a boarding school in the mountain-locked Himalayan kingdom of Nepal. He was the very first foreigner, missionary, school teacher and amateur radio operator there. In those days there was no other way to reach Nepal other than by foot across the Himalayas, with the help of numerous porters. Father Moran built his first equipment himself, which was later replaced in 1961 with a commercial transceiver which he still uses today. He estimates that he made well over 80,000 QSOs during his 60-odd years in India and Nepal.

"Up to this time I am the only operator, except for a few guests and special one-week permits, which are very hard to get. Hopefully the new government may relax the conditions for obtaining an amateur licence. Hopes are high, but they were always high for the past 40 years," writes Father Moran.

He will go to the USA in October for a six-week visiting and lecture tour, after which he will return to his beloved adopted land, Nepal. His QSL manager is: N7EB.

Father Moran 9N1MM in his shack - photo blemishes included.

Future DX Activity

* Bing VK2BCH intends to go back in August or September to Rotuma, to Tonga and to Western Samoa.
* Wolfgang DF4UW will be active on Corsica as TK/DF4UW from 2-13 September. He will use 28620, 21260, 14260 and 7062kHz frequencies. QSL to his home call.
* The Hervey Bay and Gympie amateur radio clubs hope to activate Fraser Island (IOTA OC-142) in November under the call VK4CHB.
* St Brandon Island 3B7. The plans for this DXpedition were on and off during the past month. On the last day of July, Rashid 3B8FP reported that Jackie 3B8CF was on Brandon Island; however he was not given permission to operate there by the Mauritius authorities.
* KP5 Desecheo Island. Look out for a possible 10-day operation starting 23 August under the probable callsign KP2A/KP5. All bands, all modes except RTTY, including WARC bands. QSL to WA2NHA.
* There could be some legitimate activity from Bangladesh in the next two to three months. At least two groups are trying to get permission to operate.
* According to other rumours, LZ2DF/UB5 will be active as D2ACA from 15 September.
* SEANET 1991. The 19th annual South-east Asia Network convention will be held in Northern Thailand, in Chiang Mai, between 8 and 10 November. A special callsign, HS5SEA, will be used during the convention.
* John KA3DBN hopes to be active from Africa during September, especially from Z2, A22, 7P8, 3DAO and C9. All bands, CW and SSB. QSL to home call, direct only.
* Myanmar - Burma. Do not forget that during August and/or September, Romeo, of YA0RR fame, will activate this very rare country.

Interesting QSOs and QSL Information

Note: callsign, name frequency, mode, UTC, month of QSO.

HP1XTP-Tom-14009-CW-0610-June. QSL to AE3Y, RM Brandt, 11 Whittier Ct, Severna Park, MD 21146, USA.

4U1ITU-14010 -CW-2100-June. QSL to K4IKM H N Bailey, 3917 Hilton Dr, Mobile, Ala 26609, USA.

ZF2QO-14029-CW-1019. QSL to JA7XBG Ted Sakabe, 3-9-4, Kojirakawa, 990 Yamagata, Japan.

7Q7JH-14019-CW-0430. QSL to K7AP Homer M Brock, 59915 Hilltop Dr, Saint Helens, OR 97051, USA.

VP2EE-14018-CW-0545. QSL to KD6WW Bruce D Lee, 915 P S Strathmore Ave, Lindsay, CA 93247, USA.

3W4DK-21023-0930. QSL via: UA3DK via Bureau.

GD4PTV-Brian-14180-SSB-0737-June. QSL to Brian Brough, Kimmeragh View Ballacorey Rd, Bridge, Isle of Man, UK.

9H4CM-Charlie-21169-SSB-0551-July. QSL to Charlie Mintoff, Shangri-La, Sannat Road, Victoria, Gozo Island, Malta.

3D2AG-Antoine-14016-CW-1101-July. QSL to Antoine D R N'yeurt, PO Box 14633, Suva, Republic of Fiji.

P29DX-Steve-14187-SSB-1142-July. QSL to PO Box 1783, Pt Moresby, PNG.

VU2CVP-Chitra (yl)-14165-SSB-1235-July. QSL to Chitra Vidya Prakash, Box 6330, Coimbatore 641037, India.

SV0HV/SV9-Mike-21245-SSB-0503-July. QSL to KA5EJX Rodney D Huckabay, 4002 70th Street, Lubbock, TX 79413, USA.

FO4DL-Daniel-21296-SSB-0430-July. QSL to BP 14262, Arue, Tahiti.

FO514IW-14181-SSB-0423-July. QSL to FO5IW Stanislas Wisnienski, BP 2139, Papeete, Tahiti.

4K5ZI-14195-SSB-0506-July. QSL to K4RKI Glynn R Furr Jr, 740 Landing Ln, Cary, NC 27511, USA.

ID9/IK2BTI-(Iota EU47)-1422-SSB-0614-July. QSL to IK2BTI Franco Gerosa, Via

Merizzi 36, I-23017, Morbegno, Italy.
5N4BFD-Bert-14222-SSB-0628-July. QSL to DJ9FH Berthold Sefrin, Pirmasenser St 58, D-6662, Contwig 1, Germany.
V73CF-Dick-21205-SSB-0537-July. QSL to KX6BU Kwajalein Amateur Radio Club, Box 444, APO San Francisco, CA 96555, USA.
7Q7JL-John-21205-SSB-0520-July. QSL to PO Box 2907, Blantyre Malawi, Africa.
VP8CGK-John-14126-SSB-1033-Aug. QSL to VK4MZ Kerry S Viney, PO Box 381, Gympie, Qld 4570.

RTTY News

Interesting contacts as advised by Syd VK2SG

* TU2BB-14076-0421Z ARQ. QSL to N2HOS.
* P29RB-14090-1133Z. QSL to Bob Beck, Box 73, Kokopo, East New Britain Province, Papua New Guinea.
* ZD8VJ-21094 at 1930Z. QSL to G4ZVJ.
* ZC4KS-21084 at 1139Z. QSL to ZC4 QSL Bureau or BFPO 53, London, England.
* AE9TL-14086 at 0425Z. QSL via Bureau.
* EP2ASZ-14084 at 2350Z. QSL to Saeed, Box 14155 - 1941, Teheran, Iran, or via IK6GZM.
* 9K2EC-14072 at 0200Z ARQ.
* KE0YG/TF-21074 at 2210Z ARQ. QSL to Home call or to: Lt J G Randal, Jaques, Box 27, US Naval Air Station, FPO NY 07571, NY USA.
* V47RF-14083 at 0054Z. QSL to N5FTR.
* 5W1CW-14084 at 0454Z. QSL to ZL1AMO.

From Here and There and Everywhere

* North Korea a new DX country. The DX Advisory Committee of the ARRL recommended that North Korea be added to the DXCC list with the probable prefix of P5, after the first approved DX operation. The present Korea will remain on the list as South Korea.
* Finally, some good news: 3X1AU and 3X1SG have submitted the necessary documentation to the ARRL DXCC desk, which has approved the operation, and QSL cards for these contacts are now acceptable immediately for credit on the DXCC ladder.
* If you worked 5W1CW lately, it was Ron ZL1AMO. (Ron Wright, 28 Chorley Ave, Massey, Henderson, Auckland 1208, NZ). QSL direct only with the appropriate SASE. If you QSL via the Bureau, you get your own card back rubber stamped by ZL1AMO confirming the contact.
* The strange callsign of R100RW operated by Alex was a special call celebrating the start of the building of the 9010km Trans-Siberian Railway in 1891. It took 25 years to build the world's longest continuous railway line. QSL to UA90A Alex S Pashkov, Box 44, 630093, Novosibirsk, USSR.
* Calling all lady amateurs: Dave ZL1AMN conducted a YL net every Monday on 14222kHz with check-ins at 0530 UTC. There is plenty of DX for the YLs.
* The Latin American DX net is controlled by Nathan OA4OS. He can be found on Saturday/Sunday on 14243 at around 1130 UTC.
* Tony VK9LA wants his QSLs to be sent direct to his Lord Howe Island address: Tony Blasl, c/o PO Lord Howe Island, NSW 2898.
* Contrary to popular belief, the callsign VK9HC is not a pirate, but is not a DX country either. It is a maritime mobile call, the station address is the vessel "Jarita", and he has a mailing address in Queensland. The call is the initials of the owner and was allocated to him by the respective licensing authorities. However, this puts Hans VK9HC into a difficult position: he has to explain his status every time when he has a QSO.
* There has been a lot written lately about the redemption value of IRCs at the Australian post offices. Amounts quoted range from 85c to $1.20. Please note: there is now a new international agreement between postal authorities as from 1 January 1991. Coupons can be exchanged for stamps, not money. Derek VK3DD contacted the Melbourne GPO, where he was given the following advice: The coupon is exchangeable for air mail postage for a standard letter up to 20g in weight anywhere in the world. The Australian redemption value will vary from: Zone 1 = 70c PNG, NZ, Zone 2 = 80c Fiji, Indonesia, Malaysia. Zone 3 = 90c India, Japan. Zone 4 = $1.00 USA, Israel. Zone 5 = $1.20 Europe, South America. Postal rates as at 1 April 1991. This rule applies only to IRCs purchased after 1 January 1991. Similar rule is now in force in the UK and USA.
* Graeme VK3BYO has worked portable from Fraser Island (IOTA OC 142) from 10-15 July.
* Jack T30JH advised me that during his two-months Pacific tour in May and June, he was active from Nauru C21 and Tarawa T30. He was not active from Banaba T33. He is wondering now what to do with the 30-odd QSL cards which were sent to him under the callsign T33JH. Jack has also pointed out to me that the caption linking the term "South Pacific" with T30 is incorrect. (See June 91 *AR*). His information, and my subsequent geographical reading, clarified the position as follows: There are three main Pacific Island groups. Melanesia - meaning black islands -comprises mostly P29, H44, YJ, FK, 3D2 callsigns. Polynesia - meaning many islands - comprises mostly the KH1, KH4, KH3, KH5, T32, F0, VR6, ZK1-2, A35 call areas. Micronesia - meaning small islands - includes the callsigns of KH2, KC6, V63, V73, T30, KH9, C21 and T33. I always had the opinion that amateur radio is a useful tool to improve our geographical knowledge.
* Antoine 3D2AG has left Rotuma Island. He made over 4000 QSOs, mostly on CW.
* The special event station VI4HBW was a great success. In the first week of activity it made more than 2000 QSOs. Both the club and the activity received good publicity in the regional and national press and on ABC radio and TV.

QSLs Received

Note: W = week; M = month; YRS = years; FM = from; MGR = manager and his call; OP = operator and/or callsign.

GD4PTV (4W FM OP), FR5AI/T (4W FM OP), HP8ADU (10W FM OP), VQ9AY (3M FM MGR G4RFV), 3W4VL (7M FM MGR UA3DK), HK0TU (8M FM MGR HK3DDD), 9H4CM (12 Days FM OP), SV2ASP/A (7W FM MGR SV2UA), FP5DX (4W FM OP), S21U (3M FM MGR JA1UT) AND S79KMB (3W FM MGR KN2N).

Thank You

It is always pleasing to receive one or two letters each day showing your support and interest in this column.

Many thanks to: VK2BCH, VK2CWG, VK2CWN, VK2SG, VK3DD, VK4DA, VK4OH, VK4MZ, VK4YB, VK5BGL, VK5WO, VK5ZN, VK6NE, VK6PY, ZL1AMN, DF4UW, P29UV, T30JH, 9N1MM, and the following publications: *QRZ DX, The DX Bulletin* and the *DX News Sheet.*

Good DX and 73

ar

AMSAT

Maurie Hooper VK5EA
11 Richland Road Newton 5074
Packet: VK5EA@VK5WI

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      2-Line Orbital Elements  (215.AMSAT) 3 August 1991

DECODE 2-LINE ELSETS WITH THE FOLLOWING KEY:
1 AAAAAU 00  0  0 BBBBB.BBBBBBBB  .CCCCCCCC  00000-0  00000-0 0  DDDZ
2 AAAAA EEE.EEEE FFF.FFFF GGGGGGG HHH.HHHH III.IIII JJ.JJJJJJJJKKKKKZ
KEY: A-CATALOGNUM B-EPOCHTIME C-DECAY D-ELSETNUM E-INCLINATION F-RAAN
G-ECCENTRICITY H-ARGPERIGEE I-MNANOM J-MNMOTION K-ORBITNUM Z-CHECKSUM

AO-10
1 14129U 83 58  B 91206.08900840  .00000142  00000-0  99998-4 0  6866
2 14129  25.6955 133.7576 6043592 261.6470  29.9269  2.05878543 33025
UO-11
1 14781U 84 21  B 91208.05575417  .00001458  00000-0  26711-3 0   472
2 14781  97.8981 251.4322 0013395  46.0725 314.1566 14.67160413395296
RS-10/11
1 18129U 87 54  A 91213.48629796  .00000090  00000-0  92377-4 0  7496
2 18129  82.9247  25.3756 0013216  62.5691 297.6808 13.72201604205806
AO-13
1 19216U 88 51  B 91212.85426635  .00000169  00000-0  86587-3 0  2788
2 19216  56.7781  80.5294 7214960 260.8760  18.6520  2.09697352 23966
FO-20
1 20480U 90 13  C 91194.41902861  .00000011  00000-0  54708-4 0  2399
2 20480  99.0303 171.6025 0540057 242.0255 112.5193 12.83183838 66923
AO-21
1 21087U          91213.38297212  .00000090  00000-0  88883-4 0  1123
2 21087  82.9427 200.2829 0036334 130.6278 229.8061 13.74396862 25230
RS-12/13
1 21089U 91  7  A 91212.04530116  .00000087  00000-0  85945-4 0  1129
2 21089  82.9234  71.6009 0029266 154.2605 206.0016 13.73912825 24160
UO-14
1 20437U 90  5  B 91208.19859067  .00000433  00000-0  18614-3 0  4038
2 20437  98.6662 287.4186 0012036  50.2416 309.9784 14.29192441 78700
AO-16
1 20439U 90  5  D 91213.97175889  .00000362  00000-0  15831-3 0  3011
2 20439  98.6706 293.5238 0012811  37.2739 322.9336 14.29279356 79532
DO-17
1 20440U 90  5  E 91210.72915365  .00000383  00000-0  16604-3 0  3016
2 20440  98.6711 290.3532 0013057  45.4891 314.7354 14.29366382 79079
WO-18
1 20441U 90  5  F 91208.73805310  .00000357  00000-0  15542-3 0  2978
2 20441  98.6713 288.4239 0013507  50.7292 309.5085 14.29403193 78791
LO-19
1 20442U 90  5  G 91209.06027790  .00000357  00000-0  15555-3 0  2989
2 20442  98.6709 288.8090 0013841  50.2439 309.9960 14.29480883 78848
UO-22
1 21575U 91 50  B 91210.68960467  .00000495  00000-0  18398-3 0    41
2 21575  98.5413 284.4069 0007495 181.5790 178.5371 14.36093294  1814
MIR
1 16609U 86 17  A 91213.50549239  .00034663  00000-0  42736-3 0  6115
2 16609  51.6011  59.6520 0002690 168.2403 191.8716 15.59849527312235
HUBBLE
1 20580U          91213.16450178  .00003111  00000-0  31411-3 0  4818
2 20580  28.4664 154.5240 0005442  65.9390 294.1769 14.88217233 69029
```

National Co-ordinator
Graham Ratcliff VK5AGR
Packet Address: VK5AGR@VK5WI
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
(7.064 MHz is the frequency presently in use)
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 on some WIA Divisional Broadcasts.

AMSAT Australia Newsletter and Computer Software

The excellent AMSAT Australia Newsletter is published monthly by Graham VK5AGR on behalf of AMSAT Australia and now has about 330 subscribers. Should you also wish to subscribe, send a cheque for $20 payable to AMSAT Australia addressed as follows:

AMSAT Australia, GPO Box 2141, Adelaide 5001.

The newsletter provides the latest news items on all satellite activities and is a "must" for all those seriously interested in amateur satellites. Graham also provides a software service in respect to general satellite programs made available to him from various sources. To make use of this service, send Graham a blank formatted disk and a nominal donation of $10 per item to AMSAT Australia together with sufficient funds to cover return postage. To obtain details of the programs available and other AMSAT Australia services send a SASE to Graham.

New Columnist Next Month

After nearly two and a half years with the column I am handing over to Bill Magnusson VK3JT. I'm sure he will have your support, and I know that the ship is going to be in good hands.

HR AMSAT News Service Bulletin 208.01 from AMSAT HQ

Silver Spring, MD, 27 July 1991

To all Radio Amateurs BT

UOSAT-OSCAR-22 Takes A Spectacular Picture Of Italy & Mediterranean Sea

The University of Surrey (UoSat) team has made great progress in the commissioning of all the payload experiments aboard amateur radio's newest OSCAR, UO-22. In less than a week, all the necessary software has been loaded, the satellite has gone through a complete check-out, the gravity-gradient stabilization boom has been deployed, and the first pictures have been taken with the on-board Charged-Coupled-Device (CCD) camera experiment. The CCD camera was the last experiment to be activated after the gravity-gradient boom was extended about 15 feet. Before that experiment could be activated it

was necessary to extend the boom so that the satellite's attitude would remain "earth-pointing" for the benefit of the camera and antennas. With the boom extended and the Attitude Determination and Control System (ADCS) working perfectly, UO-22's camera and antennas should remain pointed at the earth's centre for the duration of its orbital life. If the ADCS finds that UO-22 has "flipped upside down", the ADCS can easily upright the satellite.

After the spacecraft had "captured" upright and on-orbit control was achieved, the UoSat team then concentrated on the most exciting part of the mission: taking pictures. After an extensive imaging software up-loading effort was completed, the first spectacular picture was snapped while UO—22 was over Rome, Italy on 21 July1991 at 10:12:25 UTC. The outline of the "boot" of Italy is clearly visible along with the Mediterranean, Adriatic, and Tyrrhenian Seas. One can also make out Yugoslavia and Greece from the image. This high-resolution picture was converted by NK6K into the popular "GIF" format and is available on COMPUSERVE's Hamnet Forum for those with IBM PCs and EGA/VGA monitors. With this CCD camera experiment now operational, radio amateurs have a second imaging OSCAR on-orbit, the other being the MICRO—SAT WO—18, also performing an earth-imaging mission.

During the next couple of weeks, the UoSat team will be "fine-tuning" all the of the payload experiments. Radio amateurs should look for the announcements concerning UO-22's operations being "broadcasted" on its downlink frequency of 435.120 MHz at 9600 baud using the same Pacsat Broadcast Protocol as the other PACSATs. Please stay tuned to the AMSAT News Service (ANS) bulletins for further information about UO-22.

HR AMSAT News Service Bulletin 208.02 FROM AMSAT HQ
Silver Spring, MD April July 27, 1991
To all Radio Amateurs BT
Austrian Cosmonaut To Operate From MIR In The Fall

Later this fall, an Austrian Cosmonaut will operate AREMIR (Austrian Amateur Radio Experiment Aboard Mir). The mission tentatively scheduled for 2-12 October 1991 will be part of a 16- experiment package called AUSTROMIR '91. MIR's high inclination (51 degrees) makes it available to practically every radio amateur in the world.

The AREMIR equipment will include a modified Alnico DJ120E transceiver for two metres (power limited to three watts), a TNC and CW generator for the AREMIR beacon, and a laptop computer (which is part of the DATAMIR experiment) will be used with the packet equipment. The exact frequency has not been determined, but it is planned to reside within the 2m amateur satellite subband (somewhere between 145.8-146.0 MHz). Continuous Packet bulletins will be 36 characters long interleaved with a six-second tone for doppler measurements. AREMIR equipment is scheduled to be on the manifest of a Progress resupply ship in August. Sergi (U5MIR) may set up the equipment and test it prior to the arrival of the Austrian Cosmonaut. (In an unrelated story It has been reported in the Russian press that Sergi will have his stay aboard MIR extended for another six months, which will make his stay aboard MIR total a full year. In October, Sergi will be joined by his old mission commander, Alexander Volkov (U4MIR)).

AREMIR has a strong educational focus and the Austrian team of hams involved has created a special AREMIR receiver for use in Russian and Austrian schools.

The hardware for AREMIR was made possible by members of the Radio Club for Communication and Wave Propagation (RCCW) in Gratz, Austria. The team was lead by Nick OE6VND and the Dean of the Polytechnic University of Gratz, Prof Dipl Ing Dr Reidler OE6RWD. All hardware has successfully passed all required testing and is in Russia awaiting the trip to MIR. Two Austrian Cosmonauts have been trained for the mission, Franz Viehbock and Clemens Lothaller. Recent information from Russian press sources indicates that Franz Viehbock will fly the mission.

A bit. of nostalgia from "Spacenews" 29 July 1991

Satellite of the Week

The "Satellite Of The Week" feature is in response to numerous requests for amateur satellite transponder passband and beacon frequency information. All active amateur satellites will be covered in upcoming weeks.

Name : UoSAT-OSCAR-11, NASA Catalogue Number: 14781, Launched on 01-Mar-84

Orbit: Low-altitude, circular, sun-synchronous, near-polar

This is an experimental research satellite that contains no active linear transponders. A Digital Communications Experiment (DCE) is available to investigate digital "store-and-forward" communications techniques and various packet radio protocols for use in future satellites containing digital transponders. On-board experiments are designed to be of interest to amateur radio operators and science educators in the study of the near Earth space environment, including the Earth's ionosphere and magnetosphere.

Beacons include:

145.826 MHz NBFM 5kHz deviation, 400mW output AFSK, LHCP antenna

435.025 MHz NBFM 5kHz deviation, 600mW output AFSK, PSK, LHCP antenna

2401.500 NBFM 10kHz deviation, 500mW output AFSK, PSK, LHCP antenna

The VHF beacon carries 1200 baud telemetry, whole-orbit data, DCE downlinks Digitalker audio, and news, and is continuously active. The plain-text news bulletins originate from AMSAT-UK and are carried as standard ASCII having one start bit, 7 data bits, 1 even parity bit and 2 stop bits. Bell 202 modems may be used for demodulation if the demodulated data stream is inverted. Synchronous AFSK modulation techniques are used.

One cycle of 1200 Hz tone = "0"

Two cycles of 2400 Hz tone = "1"

The higher frequency beacons can carry 4800 baud downlinks from the Digital Store and Readout (DSR) experiment, where CCD Imager data is stored, along with data from other on-board experiments. This spacecraft was the first amateur satellite to operate under a Forth operating system. The primary on-board computer is an RCA 1802. It was also the fastest satellite ever built, going from design to launch in just six months!

HR AMSAT News Service Bulletin 215.01 FROM AMSAT HQ

I = rotate image 180 degrees for best orientation
r = image contains some repeated 254-byte data packets

File	#	Date	Time	Lat	Lon	Scene
CCD1A	(33)	TUE 23 JUL 91	07:25:00 UTC	26.8oN	50.6oE	Persian Gulf (I)
CCD2A	(39)	TUE23 JUL 91	10:52:00UTC	4.2oN	4.8oE	Equatorial Africa
CCD3	(8f)	TUE 23 JUL 91	14:12:00 UTC	6.5oN	54.4oW	French Guyana (I,r)
CCD4	(93)	WED 24JUL 91	08:29:00UTC	29. IoN	35.2oE	Sinai + Nile Valley (I)
CCD5	(97)	WED 24 JUL91	16:50:15UTC	3O.9oN	89.8oW	Florida+ M'IPI DELTA (r)
CCD6	(9D)	THU 25 JUL 91	09:31:02 UTC	39.4oN	21.9oE	Balkans (I)
CCD7	(A0)	THU 25 JUL 91	11:53:14 UTC	37.2oN	104.2oW	Denver (r)
CCD8	(aS)	FRI 26 JUL 91	02:15:30 UTC	34.8oN	129.7oE	Korea (I)
CCD9	(a9)	FRI 26 JUL 91	15:43:00 UTC	17.2oN	75. SoW	Cuba + Haiti (I)
CCD10	(aa)	FRI 6 JUL 91	18:59:15 UTC	32.8oN	121.1oW	California (I)
CCD11	(b1)	SAT 27 JUL 91	16:40:30 UTC	42.8oN	84.5oW	Great Lakes (r)
CCD12	(b6)	SUN 28 JUL 91	08:05:00 UTC	34.0oN	3O.5oE	Eastern South Africa (I)
CCD13	(b8)	SUN 28 JUL 91	11:55:00 UTC	36.9oN	3.2oW	Spain + Mahgreb(I,r)
CCD14	(bd)	MON 29 JUL 91	10:25:95 TC			Denmark + Netherlands (I)
CCD15	(be)	MON 29 JUL 91	12:06:05 UTC			Ireland

Silver Spring, MD 3 August 1991
To all Radio Amateurs BT
GO/K8KA Provides UO-22 Current Status Report #12: 29-JUL-1 991 17:30 UTC

We have now completed the initial phase of UoSAT-OSCAR-22's commissioning (and also a successful AMSAT-UK Colloquium at UoS). All of UO-22's subsystems have been exercised and are working.

Although we have been preoccupied by the CCD camera, we have also checked the [spacecraft] horizon sensors and total radiation dose experiment during the last few days.

With the commissioning complete and several good CCD images in the RAMDISK, we will now "open" the UO-22 uplink to amateur stations. As stated in previous releases, UO-22 is primarily a data downlinking satellite, not a BBS communications satellite.

We expect that most stations using UO-22 will be downloading raw CCD images using the PACSAT Broadcast Protocol. Since we don't intend to support BBS operations, only the Broadcast Protocol server will be available, not the FTLO file server.

Of course, without the FTLO server, there is no way for you to get a directory of files on the satellite, and you are working 'blind.'

We will solve this problem in the near future with a broadcast directory. In the mean time, please check UO-14 for a list of recent picture files, or capture whatever UO-22 file we have placed on long broadcast.

Please do not "go fishing" by trying to broadcast every file on the satellite. A list of interesting files is included in this report.

The UO-22 picture files are more than 300 kbytes long. In our experience, you can easily receive one of these files in a pass. We would suggest, however that stations resist the temptation to "begin" broadcasts. If several stations in the footprint Begin broadcast of the same 300 kbyte file, the broadcast protocol will work inefficiently, and a lot of repeated data will be sent on the downlink. Use the Broadcast Protocol in its most efficient mode: Grab or Capture for a couple of passes, then request hole fills to get the parts of the picture which you have missed.

This will result in the best performance for everyone. We will all have a lot to learn about Broadcast operation with such large files.

The OBC186 and Transputer CCD support programs on the satellite are still being debugged, so not all of the pictures we take will have the "nominal" data format.

In particular, there are sometimes 254-byte blocks repeated at places in the raw picture files.

If you are happy working your way through such problems, then by all means do so.

If you prefer to get your images after they've been cleaned up, then wait for CIF files to be uploaded to UO-14. Some custom utilities and shareware programs for doing your own GIF conversions will be placed on UO-14 soon.

73, JEFF WARD, G0/K8KA **ar**

Satellite Activity for April/May 1991

1. Launches

The following launching announcements have been received:

Intl No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1991-							
030A	Meteor 3-4	24 Apr	USSR	109.5	1229	1190	82.6
031A	STS-39	28 Apr	USA	89.4	263	249	56.0
031B	IBSS		USA	89.4	263	248	56.9
031C	USA-70		USA				
032A	NOAA-12	14 May	USA	101.3	841	821	98.7
033A	COSMOS 2143						
	through	16 May	USSR	114.2	1444	1414	82.6
033F	COSMOS 2148						
034A	SOYUZ TM-12	18 May	USSR	90.2	333	264	51.6
035A	RESURS-F-10	21 May	USSR	88.8	274	194	82.3

2. Returns

During the period 39 objects decayed, including the following satellites:

1967-027A	Cosmos	151 06 May
1976-116A	Molniya 2-16	21 Feb
1981-020A	Progress M-7	07 May
1987-036A	Cosmos 1838	15 May
1987-036B	Cosmos 1839	08 May
1991-020A	Progress-7	07 May
1991-031A	STS-39	06 May
1991-031B	IBSS	06 May

3. Notes

1991-031B IBSS and -031C USA-70 were deployed from STS-39 space shuttle "Discovery". IBSS was retrieved by STS-39 on 6 May and returned to Earth.

1991-034A Soyuz TM-12 carried two Soviet andone British astronauts, all of whom are amateur radio operators. The British astronaut Helen Sharman returned to Earth on 7 May aboard Progress-7.

Bob Arnold VK3ZBB

WARC-92 UPDATE

DAVID WARDLAW VK3ADW
WIA WARC COORDINATOR

Proposals to go to WARC 92 are now Appearing

A number of countries, including Australia, have published their preliminary positions for WARC-92.

The CEPT (European Conference of Administrations of posts and telecommunications) which has 31 members has produced its provisional views.

And CITEL (Inter-American Telecommunications Conference) has published the Report of the CITEL 1992 World Administrative Radio Conference Interim Working Group.

I am now in a position to let you know the provisional proposals of Australia for WARC-92 with regard to the Amateur Service.

Australia supports a realignment of HF broadcasting allocations on a world wide basis in relation to harmonising the amateur allocations near 7 MHz, provided that there is no net loss of broadcasting spectrum.

There are no proposals for intrusions into any other amateur bands from Australia.

The situation with regard to Wind Profiler Radars is of concern to amateurs as the optimum frequencies being quoted are around 50 MHz and 400 MHz as well as 1000 MHz.

As there is a problem at 406 MHz with interference to Search and Rescue Satellites from Wind Profiler Radars, alternative frequencies between 440 and 450 MHz have been mentioned.

WARC-92 due to the limitations of its agenda will not be in a position to make an allocation to Wind Profilers.

Australia has said there is a need for CCIR and WHO to conduct urgent studies, and for a later WARC to examine the matter of suitable bonds for the operation of wind profile radar.

HF Broadcasting

The USA has proposed the World Wide harmonisation of Amateur and Broadcasting in REGIONS 1,2 and 3

6900-7000 kHz ~~FIXED~~
AMATEUR CHANGE IN ALL REGIONS
AMATEUR SATELLITE
Land Mobile (Secondary Service)
7000-7200 kHz AMATEUR
AMATEUR SATELLITE
7200 - 7300 kHz BROADCASTING CHANGE IN REGION 2
AMATEUR

New Zealand says no intrusion into Amateur, Amateur Satellite allocations.

CEPT Position:

In respect of the 7 MHz situation the Administrations submitting these proposals offer the following re-arrangements of the existing Amateur,Amateur Satellite and HFBC allocations with a view towards eliminating the present Regional differences and thus standardising the allocations to these services on a world wide basis:

REGIONS 1,2 and 3

6900-7000 kHz ~~FIXED~~
AMATEUR CHANGE IN ALL REGIONS
Land Mobile (Secondary Service)
AMATEUR SATELLITE
7000-7100 kHz AMATEUR
AMATEUR SATELLITE
7100-7300 kHz BROADCASTING CHANGE IN REGION 2
~~AMATEUR~~

CITEL Position

There should be no intrusions into or reduction of the Amateur or Amateur Satellite Service from 3.5 MHz to 10 MHz.

The Broadcasting requirements have greatly exceeded the number of available channels in the allocated spectrum.

HF spectrum is essential for Services other than Broadcasting.

VHF and Up

The original USA proposal that 420-421MHz be allocated to the MOBILE SATELLITE SERVICE which could have affected the Amateur Service in Australia has been withdrawn.

The USA has also made proposals concerning the 2300-2450MHz band which if accented may cause further restriction in access to the band by the amateur service and especially the amateur satellite service.

The USA has a proposed RECOMMENDATION Relating to Interim Implementation of Wind Profiler Radars at Frequencies Near 400 MHz. For WARC-92 to put forward. This could easily affect the 420-450MHz amateur band as the frequencies have been left for the Conference to insert.

(The above tables were also shown in the August issue, but the strike-outs were left out confusing the displays - Ed). ar

WICEN

JOHN WARREN VK3DKD PO BOX 226 WHITTLESEA 3757

WICEN at the 10th annual Essendon Canoe Club Night Race

I always thought that ham radio operators were about the weirdest lot going, but on Saturday 3 August my whole concept changed. Who in their right mind would venture out on the Maribyrnong river, after dark, in the middle of winter, with the temperature around 10°, and God only knows what the water temperature was at the time.

The answer - around 100 participants of the Essendon Canoe Club. It seems they have had nine years of this masochist "sport", and this is the first year they have had radio safety coverage. This coverage fell to the WICEN Region H, I & J (formerly called Region 14) which provided three mobile boat operators, three shore checkpoints and net control. With nine operators showing up we had the luxury of two net controllers and one "gofer" as coffee, hot soup and sandwiches were provided for the WICEN operators.

For the technically minded, we used 147.300 simplex as the primary frequency, with 438.800 as secondary. This secondary frequency proved too noisy on the day (due to passing trams) so the repeater on 438.025 was monitored, but was not used in this exercise. The first commandment in all WICEN call-outs still remains "keep flexible".

For the sports minded, the club ran an 18km course for open and vet classes, and a 12km junior and women's class. (Whatever happened to equal rights?) A hat with a chemical light was provided since torches were prohibited on the water. All boats had a positive buoyancy and all competitors were required to wear a legal lifejacket.

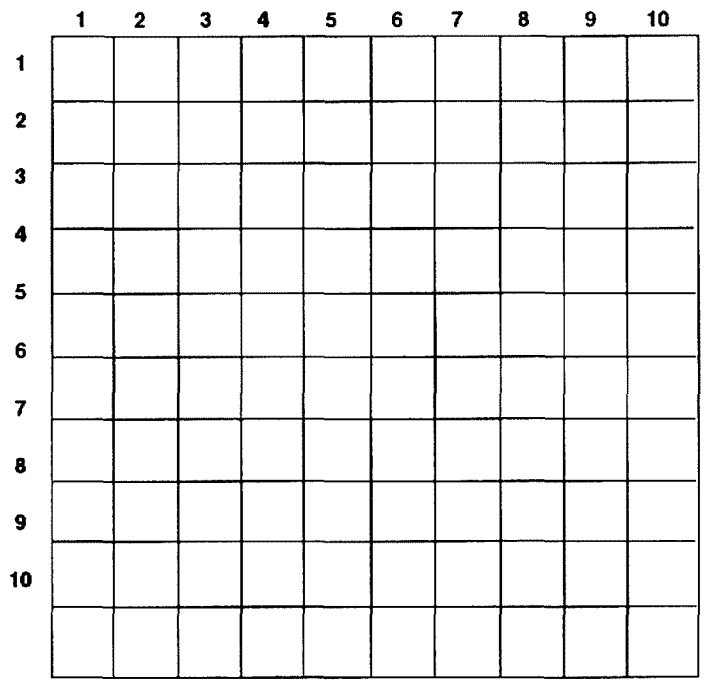
The race briefing was at 1800, with the first group off at 1830. The net was closed at 2115 with six slightly blue WICEN operators returning for hot soup and coffee.

All this may not be your "cup of tea", but to the nine VK3 operators it was a night to eyeball, talk radio, practise short and clear message handling, and to be part of a community group which gets off its tailbone to enjoy its hobby. When was the last time you left your warm shack and helped out WICEN?

ar

Morseword No 54

Solution Page 64

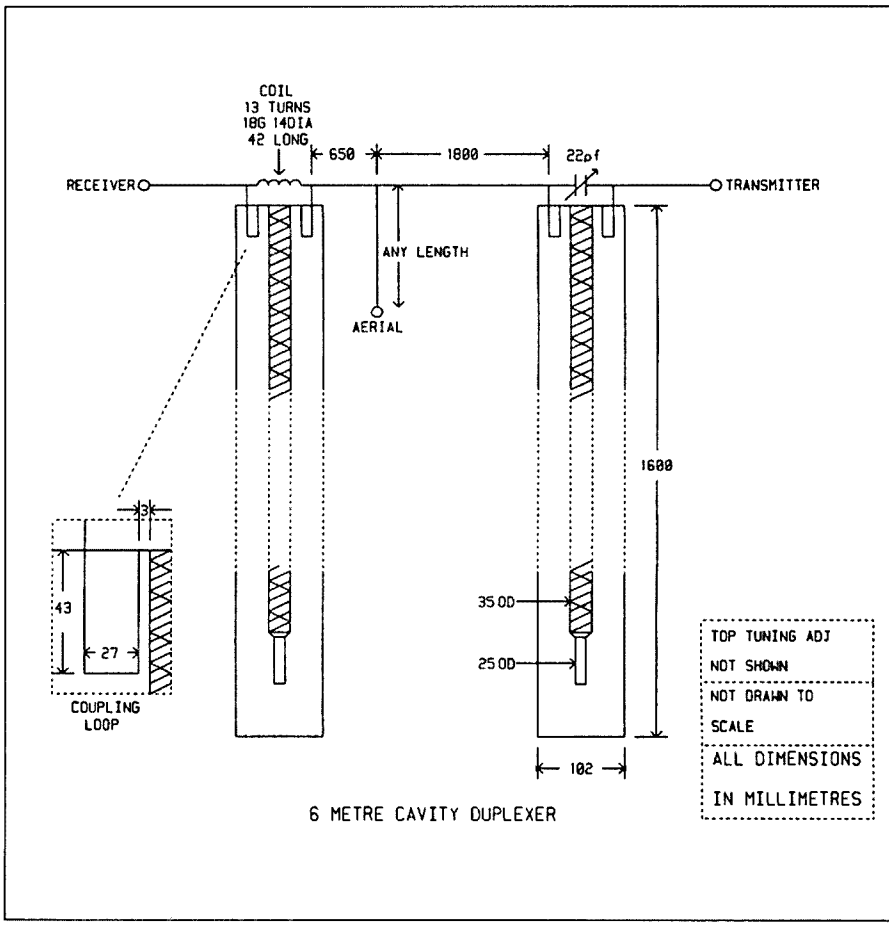


Across:
1 Noble boy?
2 Foe
3 Mix in
4 Communists
5 Strong wind
6 Run fast
7 Barbecue meat
8 Endure
9 Mend
10 Small island

Down:
1 Glen (NSW town)
2 Coral sle
3 Stand for coffin
4 Slaps
5 WWI battlefield
6 Actual
7 Crooked
8 Taxi
9 Hawaiian garlands
10 Ear

REPEATER LINK

WILL MCGHIE VK6UU @ VK6BBS
21 WATERLOO CR LESMURDIE 6076



6 METRE CAVITY DUPLEXER

Six-Metre Duplexer

With more and more 6m repeaters coming into service, a 6m duplexer may be of interest to repeater designers.

The question was, could the familiar 2m cavity be scaled up in size to work on six metres? The results of building two such cavity filters indicated that they would work as notch filters and provide sufficient isolation for a duplexer on six metres.

The design, as shown in the accompanying diagram, is the result of considerable fiddling, but is by no means the optimum. A larger-diameter outside tube would provide superior performance.

Not understanding how the dimensions for the combining coax is arrived at, a lot of cut and try resulted in the dimensions shown. Simply scaling up from the 2m coax sizes did not work. Does anyone know how these coax lengths are worked out?

The inductor in the receive cavity has considerably more inductance than its 2m counterpart.

When completed the duplexer has an insertion loss of 1dB and a notch depth of better than 60dB. Depending on the characteristics of your repeater, this may or may not be enough isolation.

A split aerial system may be required to add extra isolation. In this situation, the cavity filters are not joined via the coax combiner, but connected one in each aerial lead to the receiver and transmitter. The aerial separation in this situation can be as little as two metres.

The centre resonator is a quarter of a wavelength long and will require support other than at the top. Polystyrene can be cut to fit about halfway down the tube and provide this support. This material has no effect on the operation of the cavity filter.

When completed, these cavity filters stand tall, over 1.6 metres tall. The alternative to building these filters is either large vertical aerial separation or a split-site repeater. If you are able to improve on this design, please let me know so I can pass it on.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

Very early on in my career as a morsiac (one with an insane dislike of microphones), I realised that argument about the merits of using the code was not going to generate much interest in its use. I was easily conned into writing for Pounding Brass, and soon discovered that a positive attitude was essential to generate ideas for the benefit of morsedom.

I therefore suggest that all morsiacs refrain from worrying about the antics of those who want to drop the code requirements (for whatever reason) and dedicate their time and effort to more positive procedures.

Opponents of morse are directed to read the article "Amateur Morse Code Requirement" on page 4 of *Amateur Radio* for July 1991. They will see that there is a lot of work ahead and that they will have to wait for the WARC after the WARC92 to get their proposals on to the agenda.

Okay morsiacs, what positive procedures?

We need to create an atmosphere where the use of the code is prominent. This means advertising and marketing. And the easiest, if not the best way to achieve this is to have more space in *AR* for morse subjects. What this boils down to is that somebody has to write articles and send them in to *AR*, and any other magazine which might publish them (*ARA*, *EA* etc).

This somebody should be YOU. If every morsiac wrote an article once a year it would be enough. So get moving.

There are many other positive things you personally can do as well. Give a talk or demo to your local Scout, Guide or Cub groups. Give one-on-one training to someone who you know is interested in an amateur ticket. Maybe they just passed an exam; help them get on air with code. I'm sure you can think of more. I sure hope you can DO more.

Deaf Morse?

VK5JG writes, "I am a very old amateur (84) and consequently I am somewhat deaf. I use a hearing aid which helps in ordinary conversation and in radio listening, provided there is no noise. The hearing aid is set to amplify the higher frequencies which my ears have partly lost, and this amplifies the noise more than the speech and, therefore, is of no use on the HF Phone bands unless the signal strength is S8 or better, or the noise level is unusually low. However, using CW my ears can detect dots and dashes in spite of high noise levels, and I can always copy in this mode. This is a big advantage of CW that I have not heard mentioned before."

This suggests to me that there could be a world of radio communication available to all deaf, or partially deaf, people if only someone could tell them about it, and perhaps show them how to go about getting a licence. Are there any specialist magazines for deaf people? Is there a group near you? How would one go about designing a flashing light controlled by a receiver for totally deaf people? Are you in a position to help?

These days, many amateurs sending CW use electronic keyers, and with these keyers, very fast sending is possible. But many amateurs attempt fast sending beyond their ability, and the result is rushed sending with lack of spacing and no rhythm, and is difficult to read. This rough and fast sending heard by new amateurs deters them from using CW.

Many morsiacs have said in the past that spacing is more important than speed, and any contester will have experienced the truth of this. I noticed that during the two-hour scramble on 1 July the speed setting on my keyer was only about 12wpm, and this seems to be common under noisy QRP conditions where it pays to get the message through first time, as fading often causes a complete loss of communication.

I have a list of 48 people who have been sent Gary Bold's morse programs on disc so far. I am still able to supply these (on 360K discs) and you may either send a formatted disc, with return postage and packing, or send me your request with $5 and I will supply the disc, packing and postage, and as much morse software as I can fit on the disc. I should soon be able to supply 1.2meg discs as well!

Watt is Electricity

Electricity is a colourless, odourless gas which burns with a bright flame.

Light grows from a bulb.

An amp is a little animal that crawls along a wire.

An amp lives in an ohm.

In summer an amp lives in a coulomb.

Polarisation is the changing of an ohm into a coulomb.

An ammeter is an animal that eats amps.

A battery fires amps around a circuit.

An amp rides around a circuit on a megacycle.

Megacycles are parked on a grid.

Flemming's right hand rule states that: All amps must ride their megacycles on the right hand side of the wire.

A charge occurs when all the amps ride down the circuit at the same time.

All amps meet at an accumulator.

An oerstead is an ohmstead for orses.

A joule is a fight between two amps.

You receive a shock when an amp isn't wearing any shoes.

And you must watch out that the amp isn't riding a kilocycle, because then it hertz.

(I don't know where I got this tripe, but it's fun, so thanks) Gil.

ar

ALARA

DOROTHY BISHOP VK2DDB
153A GALSTON RD, HORNSBY HEIGHTS 2077

I am privileged to be your roving reporter for a few months and have been scanning the airwaves instead of scouring the house.

Congratulations to our Publicity Officer Jenny VK3MDR who, on 23 July gave birth to a daughter, Kate Elisabeth May. Obviously another YL for ALARA!

We would like to say a hearty thank you to Rod Torrington VK3TJ, who responded to our appeal for information about the early YL amateurs. Rod seems to have spent a very long time going through all his callbooks and compiling a list of the YL callsigns, names and addresses, covering 1938, then 1947 to 1977. We are beginning to get a fuller picture of the early days and really appreciate the work Rod has done.

Congratulations to Marilyn VK3DMS, who won a silver medal at a Philatelic Exhibition in Melbourne in July. She prepared a stamp collection on the history of radio and its application by amateurs. Being an amateur and a stamp collector, Marilyn found it a lot of fun to prepare and - as this was the first time she had exhibited her radio collection - was surprised it did so well. Want to know the name of the collection?... "Radiomania".

On 21 July, 13 VK5 ladies met at the Springfields Restaurant for a very pleasant ALARA birthday luncheon. Several of the ladies live fairly close, some came from across town, but others travelled quite a long way to be there - Lorraine VK5LM from Mallala and Mary VK5AMD from Bordertown. Afterwards they were joined by some of the OMs for coffee. A highlight of the event was the introduction of a new ALARA item - scarves. I haven't seen one yet, but I like it already!

From VK2, I heard that Joy VK2EBX won the DX-YL certificate in the BYLARA Contest. Congratulations Joy for the certificate, and also for the Life Membership bestowed on you by the Orange Radio Club. It is interesting to hear of the travels of some of our YLs who keep regular skeds whilst trekking into the less populated parts of Australia. At the time of

writing, Maria VK5BMT and Marlene VK3WQ are both in different places in northern Western Australia. Poppy VK6YF had a trip away, and is now back home.

Diana G4EZI is home again in Leeds after a wonderful trip to the YL World '91 Convention in Stockholm. As there were between 200 and 300 YLs from 80 countries, the QRM was tremendous. Every time a familiar voice was recognised, old and new radio friends met with shrieks of delight. A special 'ladies only' station SK0YL was set up and Diana used a special callsign SK5YL on the YL 222 DX net on 1 July.

Speaking of the YL 222 DX net, it is really worth listening to, even if you cannot get on at the time. The net controller is Dave ZL1AMN, and he does a really good job. Since he started taking the net in late March, there have been 96 separate YLs from 22 different countries. The net is on 14.222 at 0600 UTC, but because of time differences, Dave sometimes starts a bit earlier so that girls in America and Canada can get to bed before midnight.

Don't forget the ALARA net on Mondays 3.580+- at 1030 UTC. Conditions have been fun lately outside and inside my household! My OM John has a 2m net at 1000 UTC, so he is relegated to the dining room with his handheld when I start on 80m at 1030. Conditions on the air are not so easy to control, because when I can hear everyone else there is a good chance that they cannot hear me. That's radio! 33

ar

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. The information given below has been supplied to the WIA free of charge by Thornton Publishing. Your divisional library may have copies of the references quoted.

Antennas

Mechanical Details

SPSM Mobile Mount. David A Clingerman W6OAL, *73* issue #369 June 1991 pp 34, 36 -37. il diags and photos. A design for a lip mount which is suitable for supporting a HF antenna for mobile use. A ball mount is included as part of the assembly.

Miscellaneous

Antenna Here is a Dipole. James W (Rus) Healy NJ2L, *QST* vol LXXV No 6 June 1991 pp 23 - 26. il diags and photos. A definition and general discussion of dipoles is given. A table of approximate lengths for each HF band is presented. Practical considerations of construction are described.

Controlled Feeder Radiation Revisited. B Sykes G2HCG, *RadCom* vol 67 No 1 July 1991 pp 46 - 47. il diag. A refinement of a concept of using the last quarter wave of a coaxial feeder as an active radiator, in combination with a normal antenna. The designs of various ferrite chokes to achieve this are discussed.

Transforming the Balun. John S Belrose VE2CV, *QST* vol LXXV No 6 June 1991 pp 30 - 33. il diags, graphs and photo. An extension of W2DU's ferrite bead coaxial balun concept provides 4:1 and 9:1 impedance ratios. Two short lengths of 93Ω coax, enclosed within ferrite beads feed a balanced 200Ω load from a series connected output; the inputs are parallel connected. Similarly, three 150Ω cable lengths can produce a 9:1 impedance ratio. Improved efficiency and bandwith is claimed over a bifilar toroidal balun.

VHF/UHF

Simple Antennas For 2 Metres - Part 2. Glyn Fogell ZS6AKQ, *RadZS* vol 45 No 4 April 1991 p 6. il diags. A design for a quarter wave vertical ground plane antenna is given. Radials are at 45° to the horizontal plane.

Simple Antennas For 2 Metres - Part 3. Glyn Fogell ZS6AKQ, *RadZS* vol 45 No 5 May 1991 p 10. il diag. A Slim Jim design is given, with a general discussion on the technology and performance of such antennas.

Audio

The Oscamp. T C 'Ced' Tanner VE3BBI, *QSTVE* August 1991 pp 3 - 4. il ccts, cmp, pcb and photos. A combined oscillator/amplifier is described. The oscillator has an adjustable frequency output, variable over a wide range. It may also be used as a tone decoder. The amplifier has sufficient output to drive a loudspeaker, and may be used independently of the oscillator. Two ICs form the basis of the circuit.

Computers

Accessories

EA-88 IBM PC Radio Interface. Marijan Miletic YU3EA/N1YU, *QEX* No 112 June 1991 pp 13 - 16. il ccts, cmp and pcbs. A design for a plug-in interface which enables a computer to control the station frequency and mode, to receive and transmit Morse code, and to record and play speech. The latter facility is provided by Continuous Variable Slope Delta modulation (CVSD). The double sided PC board and the necessary software will be made available through MFJ.

Hardware

A Microcontroller Based Multimode Reader. Steve Haynal AA6DG, *QEX* No 112 June 1991 pp 3 - 12. il ccts, cmp, diags, photos and pcb. A complete design for a reader which decodes Morse (3 - 80 WPM), Baudot RTTY (45,50,57, 75 and 100 bauds), ASCII (110 bauds), plus ARQ and FEC TOR modes. A Motorola MC68HC705C8 microcontroller unit is central to the design. A liquid crystal display and an EIA-232 interface are included as options. The necessary software to program the microcontroller is available from the Author.

Improved Serial I/O Interface for PCs - 1. Jim Rowe VK2ZLO, *EA* vol 53 No 7 July 1991 pp 58 - 64. il cct, cmp, pcb and photos. An interface unit which can control the function of remote equipment via 8 different outputs. Similarly, sensing of remote indicators can be done via 8 inputs. Cascading of units can extend the range to 64 inputs and outputs. The device is suitable for use with any RS-232 equipped computer.

Software

Multimode Tx/Rx Software for BBC Micros. (Product review) Mike Wooding G6IQM, *RadCom* vol 67 No 7 July 1991 pp 37 - 39. RX-8 Software package supplied by Technical Software. It supports AMTOR/SITOR (ARQ and FEC),ASCII, Fax, Morse, Packet, RTTY, SSTV UoSAT 1 and UoSAT 2.

Software for the Ham Shack, Part II. Bill Clarke WA4BLC *73* issue #369 June 1991 pp 44 - 45. An extension to part I which incorporates programs for Ohms law, power formulas and efficiency formula.

Swisslog Version 3.66. (Product Review) Dick Goodman WA3USG, *73* issue #369 June 1991 pp 46 - 47. il photos. A discussion of the features of this software package is given. It is a complete QSO tracking system.

Electronic Devices

Miscellaneous

Build the Brass Pounder's Keyer. Dan McCranie AA6GG, *73* issue #369 June 1991 pp 22, 24, 26, 28 and 32. il ccts, cmp, graph, pcb and photos. A memory device which can transmit pre-recorded CW messages reproducing the operator's keying style. The output speed can range from one third to twice the original.

Fan Speed Controller. Peter Phillips, *EA* vol 53 No 7 July 1991 pp 70 - 74. il cct, cmp, diag, pcb and photos. Fan speed is controlled via a SC141 triac, using phase control via a diac. RFI suppression circuitry is included.

Simple Quiz Buzzer. Peter Murtagh, *EA* vol 53 No 7 July 1991 pp 78 - 82. il ccts, cmp, diags, pcb and photos. A common buzzer and individual LEDs are activated by each player's push button. Flip-flop circuitry ensures that activation of any button locks out the other players, until reset. Discrete components only are used.

Trip Lite PR-25A Power Supply and Isobar 8 GS Surge Suppressor. (Product Review) David Cassidy N1GPH, *73* issue #369 June 1991 p 38. A description of a surge suppressor suitable for protection of transceiver circuitry, as well as straight computers.

Telephone Accessories

A Practical and Versatile DTMF Decoder (1). Farrell Segall ZS6RW, *RadZS* vol 45 No 5 May 1991 pp 12, 24. An introduction which outlines the design goals for this 6 digit decoder, to be described in succeeding articles.

Filters

A Pseudo CW Filter. Jim Melton WR5B, *73* issue #369 June 1991 pp 18, 20. il ccts, cmp, pcb and photo. An audio oscillator which is keyed by an in-coming CW signal. It is claimed that hash and static are eliminated.

Packet

Digital Communications for the Radio Amateur Part 5 (Modems). Robin M Braun ZR1RMB, *RadZS* vol 45 No 5 May 1991 pp 4 - 6, 8. il ccts and graphs. A general discussion on the functioning and relative merits of commercially available modems is given.

PSK Anyone? John C Reed W6IOJ, *QEX* issue 113 July 1991 pp 3 - 7. il ccts, graphs and photos. A design for a 1200 baud Phase Shift Keying system suitable for use on HF is given. A 1.8 kHz 6 dB bandwith is claimed. A special tuning aid, to simplify fine tuning adjustment, is included in the design.

Power Supplies

Miscellaneous

Trip Lite PR-25A Power Supply and Isobar 8 GS Surge Suppressor. (Product Review) David Cassidy N1GPH, *73* issue #369 June 1991 p 38. il photos. A description of a 25A 13.8V commercial regulated power supply is given.

Series Regulated

First Steps in Home Construction (1). John Case GW4HWR, *RadCom* vol 67 No 5 May 1991 pp 38 -39. A design for a regulated power supply adjustable from 4.5 to 13V, with an output up to 1A. Current limit is switchable from 100mA to 1A. Part one of this series takes a very basic look at the technique of soldering.

First Steps in Home Construction (2). John Case GW4HWR, *RadCom* vol 67 No 6 June 1991 pp 42 - 43. il cct and diag. Part 2 discusses in detail the circuit to achieve the specifications described in part 1, using discrete transistors.

First Steps in Home Construction (3). John Case GW4HWR, *RadCom* vol 67 No 7 July 1991 pp 40 - 41. il diags. This part deals with the construction of the equipment box and front panel.

Receivers

Home Brew

HK-2M 2 Metre Receiver Project. Chris Turner ZS6GM & Henri Ketelaars ZR6HK, *RadZS* vol 45 No 4 April 1991 pp 10 - 12. il cct. A design for a double conversion 2m receiver is given. Crystal control is used for channel selection. Simplicity and low cost is claimed; only readily available components are used. Complete kits will be available from SARL.

Miscellaneous

FRG7 Receiver Modifications. Allan C Ashton, *RadZS* vol 45 No 5 May 1991 pp 14 - 15. A method is described in detail for modification of the fine tuning capacitor, so that tuning of SSB signals is easier.

Technology

HF Direction Finding. Chris Plummer G8APB, *RadCom* vol 67 No 6 June 1991 pp 38 - 41. il cct, cmp, diags and photos. A general dissertation on the theory of DFing, and its sport protocol. A specific design is offered for a 160m receiver for this purpose which includes sense circuitry.

Parts Substitution. Bruce S Hale KB1MW/7, *73* issue #369 June 1991 pp 40, 42. A general beginner's guide which describes how parts on hand may be substituted for specified components. Resistors, capacitors and semi-conductors are considered.

The EZY Launcher. Wade A Calvert WA9EZY, *QST* vol LXXV No 6 June 1991 pp 34 - 35. il cartoon and photos. A design is given for a catapult device which can project a line over a tree branch. A fishing reel is attached; the brake may be used to control the trajectory of sinker and line.

Transceivers

Home Brew

A Miniature 80 Metre SSB Transceiver (1). Mike Grierson G3TSO, *RadCom* vol 67 No 6 June 1991 pp 44 - 46. il ccts and photos. The complete design of a 30W 80m transceiver, which is based around low cost IC chips developed for cellular radio.

A Miniature 80 Metre SSB Transceiver (2). Mike Grierson G3TSO, *RadCom* vol 67 No 7 July 1991 pp 30 - 32. il ccts. An elaboration of the detail for this transceiver is given in this part.

Product Reviews

FT-1000 Yaesu HF Transceiver. Peter Hart G3SJX, *RadCom* vol 67 No 6 June 1991 pp 49 - 51. il graphs and photo. A report, with measurements included, on the performance of this transceiver.

QST Compares: Dual-Band Hand-Held FM Transceivers. James W ('Rus') Healy NJ2L, *QST* vol LXXV No 6 June 1991 pp 36 - 41. il photos. A feature by feature comparison of the performance of Alinco DJ-560T, ICOM IC-32AT, Kenwood TH-77A, Standard C228A and Yaesu FT-470 dual band transceivers. Measurements are compared against specifications. A comprehensive yes/no chart is provided.

The KE2AM Voice ID and Repeater Controller. Bill Brown WB8ELK, *73* issue #369 June 1991 pp 12. il photo. A review of a commercially available module which includes voice identification, time-out timer and squelch tail timer for repeater operation.

Transmitters

QRP

Three Bands with One Rock. Mike Gasperi WW9X, *73* issue #369 June 1991 pp 10 -11, 42. il cct, cmp, pcb and photo (p 34). A design for 80, 40 and 20m, which uses frequency division from a 20m crystal for the lower bands. Power output is aproximately one watt. A limiting circuit allows full break-in operation. An appropriate π network filter is selected for the band in use.

VFOs

Build a Universal VFO. Doug DeMaw W1FB, *QST* vol LXXV No 6 June 1991 pp 27 - 29. il cct, cmp, photos and pcb. A design is presented for a low drift VFO with buffered output (2.3 dBm). The frequency ranges for which specific component values are given are: 1.8 - 2, 2.1 -2.6, 3.5 - 4, 5 - 5.5 and 7 to 7.3 MHz. A DC controlled frequency offset is incorporated. Frequency drift is less than 100 Hz in the initial 4 minutes at 2 MHz.

Glossary of Abbreviations

il The article contains illustrations, a list of which follows.
cct A circuit diagram
cmp A component layout drawing
EA *Electronics Australia*
diag A mechanical drawing
pcb A master drawing from which printed circuits may be produced
QSTVE *QST Canada*
RadCom *Radio Communication*
RadZS *Radio ZS*
73 *73 Amateur Radio Today*

The above items are reproduced from Amateur Radio Technical Abstracts Volume 1 1991 ISSN 1036-3025 - to be published.

ar

Help stamp out stolen equipment - keep a record of all your equipment serial numbers in a safe place

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH
CO-ORDINATOR
'AVIEMORE' RUBYVALE 4702

Band Conditions have been rather poor on all bands, and variable at best. From the summary it is evident we are getting a lot of non-stop RRTY F7B. These are very difficult to resolve. Solar activity is hampering those around 14.023MHz but, despite this, they are still causing annoyance in VK.

By and large, our biggest offender on the bands is USSR. Their broadcasters tend to use unnecessarily high power, and radiate signals of inadequate transmission quality.

Listen on 21.355. It has the fundamental on 21.505. In VK4 it can be heard at S9+40dB. It is broad, and interferes with other domestic SW sections due to poor sideband control and splatter. It is listed as being in CHITA. Who would want to know them, with such operating methods? I hope Radio Australia, which shares this frequency of 21.505, has cause at some time to complain. We may see some action on our behalf then, but don't hold your breath!

Why does USSR have such poor operating procedures?We surely would not put up with it in VK, would we?

Many R7B & P0N intruders in 29-29.7 segment, some as wide as 30kHz, very hard to track down when no callsigns given.

Reports this month from: VKs 2GDF, 3DVT, 4BG, 4AKX, 4BHJ, 4BTW, 4BXC, 4CAS, 5TL, 6CH, VK6RO, 6XW, 7RH and 2EYI (sorry Don, you should've been up the list a bit). My thanks to all. Gordon VK4KAL. **ar**

IARUMS Summary for June 1991

Date	Time U/TC	Freq in MHz 'M' or 'E'	Callsign if Heard	Mode	RST	Logs X	Details of Traffic if Known and any other Information
150691							
105691	1009+	3519		P0N			Signals 9-12kHz wide also on
1606	1051+	3595		P0N			3549/3564/3585kHz
1005	1325	7002+	"V"	A1A		5	Machine code abt 5wpm
170691	1341	7020		A3E		1	Asian b/caster music
1206	1325	7058.5		A2B			Duplex QSV BR QSA1 de LSD3
1806	1215	7080	A3E				B/c interview in an Asian lang
1806	0746	14000		J3E		4	Foreign b/caster, Pacific Is tfc
2406	0625	14002/3		J3E		4	B/c foreign
250591	mni	14005+		F7B?		22	Non-stop RTTY? no shift given
2805	mni	14007		F1B		16	RTTY 1000Hz shift
2405	mni	14023.5		F1B		28	RTTY 250Hz shift plus RYs
0106+ hrs	mni	14044/5		J3E/L		72	Asian RTF+N0N to 14048 24
Mni	mni	14058		AC3		60	24 hrs Helschreiber
Mni	mni	14070+	VRQ	A1A		78	Viet 5 ltr code
Mni	mni	14070	VBX	A1A		26	as above with VPC in this group
Mni	mni	14085+	NPO	A1A		16	with KFB all VRQ clones
Mni	mni	14140	UWXS	Multi		8	Nav radio/Yaroslavl (57deg40'N x 40deg E) ULYA often replies
This station appears to be for certain activities, ie SPY NETWORK!							
2605+	mni	14170	UMS	F1Bcw		33	Mostly 250Hz shift RTTY
170691	1040	14174	5PP	A1A		7	No other info
2505+	2210+	14202+		F1B		15	2ch 14205.5 NOT F7B
1106	0734	14210		F1B		2	3kHz wide
Mni	mni	14211+		multi		59	1000Hz/14215-250Hz RRTY
Mni	mni	14217+	UMS	F1B		7	ID in CW Mosc Nav rad USR
0906	0230+	24907	CNN	J3E		2	News b/cast, ON this mode?
2305	0505	21031.5	UMS	F1/A1		18	MNR all day USR
Mni	mni	21115+	CQ5	A1A		17	To 21120MHz Tfc out
1606+	1040+	21250		R7B		5	Jammer abt 4kHz wide
2305	0535+	21347		F1B+		21'	SX fax (SP 120rpm 24 hrs on
2606	0700+	21355		A3E		12	Broadcast Russian language
250591	0529	28478/9		F1B		16	Continuous RTTY 1000Hz shift
2205	0655	28484		F1B		2	RTTY as above
2206	0933	28980		A3E		4	B/c band music/talk in Russian
2305	0525	29190		A3E		4	B/c music & speech, French?

DIVISIONAL NOTES

VK6 NOTES

HARRY ATKINSON VK6WZ

Has any other Division ever received 18 nominations for its council?

The postal ballot resulted in a 62 per cent return from eligible members, with four per cent of that number informal. The results:

VK6WZ	379 votes	VK6AFA	215
VK6IW	333	VK6KWN	210
VK6HK	331	VK6DA	204
VK6NE	321	VK6ZGT	203
VK6OO	314	VK6ZTN	184
VK6GU	306	VK6ATA	130
VK6LZ	253	VK6TTV	119
VK6ZIZ	248	VK6BC	117
VK6QL	230	VK6NBG	88

The nine in the first column were duly declared elected to the VK6 council for 1991/92. President, VK6LZ; vice president, VK6WZ; treasurer (reluctant, he says) VK6OO. VK6AFA, although not elected as councillor, has agreed to continue as secretary, for which we thank him!

The WA Annual 80m CW contest has come and gone, but the 'phone section comes up on Sunday 7 September. Give it a go - it runs only three hours. Refer pages 33 and 34 July *AR*.

Next month brings two important events - the NCRG Hamfest at Carine TAFE and, of course, JOTA,. And spanning part of this month and next, the Southern Electronics Group special event station to mark the 200th anniversary of Captain Vancouver's landing in King George Sound in 1791, 35 years before Lockyer landed his small party of settlers to found Frederickstown, now Albany.

V16SR will be on air from 28 September to 11 October. All bands. All modes. *(See Club Corner p54 for further details. - Ed)*

5/8 WAVE

ROWLAND BRUCE VK5OU

Okay, so there was a double dose of 5/8 Wave last month, but I've got it right now, and I am indeed your guest contributor this month whilst Jenny is away. Please note that, contrary to the pattern the September meeting of the WIA will not be members' equipment night, but instead will be the first of the meetings to be run by an affiliated club, namely VK5BP and will be devoted to JOTA and AUSSAT involvement in particular. The members' equipment night will now be the October meeting.

The exhibition put on by WIA and affiliated clubs at the Hobbies' Fair at the Wayville Showgrounds was a great success. Unfortunately, having fixed things so I would be free to lend a hand in the setting up, and in the operating of the WIA station, Murphy struck in the form of the worst cold/flu I have had in years and all I could do was to listen on 2m in bed. This means that to date I am not sure of all the people I should thank for their involvement. I'll sort that out in due course, but, ahead of that, let me say that a vast number deserve those thanks. The exhibition showed many aspects of this hobby of ours: transmitting stations, both amateur and CB, ATV, packet radio, RTTY, SWLing readily come to mind, and there were probably other things too which I have yet to catch up with. Thank you all for your involvement.

Camp Quality is a camping experience - and much more - for children with cancer. At the July meeting,a short talk was given by Kevin Johnson, who is the registrar of the Camp Quality organisation. The organisation is a non—profit one, supported in SA by Saints Church, Rotary International Districts 9500 and 9520, and by the Adelaide Medical Centre for Women and Children, (ACH as was.) He told us that at this year's camp it is planned to run a short technology activity for the children. In fact there will be five of these for eight to ten children, each lasting about 90 minutes. Two will be morning of 30 September and on on 4 October. Kevin is looking for volunteer helpers, people who can solder a joint or else unsolder it and use wick, etc. The children will already have one-to-one adult care; this is extra. If you feel you can spare some time to help, or can lend equipment then please give Kevin a ring on 230—9612(w) or 341—2711(h) and he can give you further details. On top of this, Chuck Waite has arranged to run an amateur station at the camp using his own callsign, which happens felicitously to be VK5CQ.! If you would like to help with this, contact either Kevin or Chuck. This really is an area where we can extend our hobby beyond the normal limits. Talking of limits, the children on camp, although cancer sufferers, are very fit and active engaging in activities as demanding as abseiling for example. Please give it some thought. ar

VK2 NOTES

TIM MILLS VK2ZTM

Happenings:

The Alinco ballot has now been completely distributed. There were almost twice the number of applications to available units . . . Trash and Treasure on 29 September at Parramatta . . . Fourth Gladesville/AUSSAT test scheduled for 25 September.

The July test was well received in the south-east footprint. Listen to your Divisional broadcast for details nearer the date . . . Don't forget to submit your RD Contest entry, VK2 needs your score . . . The VK2RSY beacons were fully restored to their original antennas at intervals during July as repairs were completed . . . About the same time, however, it was discovered that the birds had taken a fancy to the 70cm repeater antenna, and chewed holes in the radome and coax, to the extent that it had become water cooled and about as good as that piece of wet string . . . Peter VK2NPW conducted a test for three months with a relay to 15 metres on behalf of VK2WI. It provided good feedback on the interest shown, and many thanks to Peter for his efforts. Until equipment is obtained for placement in service at VK2WI, we are interested in relays to 20-17-15 and 12 metres. A couple of stations per band could share the workload.

In late July the Division hosted a meeting of Packet BBS operators and interested parties to discuss many aspects of current operation . . . A 70cm forwarding port has been added to VK2RWI packet.

Members will be aware that the Division maintains an extensive historical record on all VK2 callsigns under the supervision of Jo VK2KAA. To assist research of these details, please consider passing on your old log books and other records when clearing out the shack or winding up a silent key estate.

Don't forget the QSL card collection. The written record on them is far more valuable for the research than sent somewhere else to make up a display of pretty cards. Please forward to the Divisional office - see page 3 for contact details.

New Members

A warm welcome is extended to the following who recently joined the NSW Division:

WB	Chegwidden	VK2GIZ	Miranda
MWJM	Collett	VK2UCM	Mt Warrigal
M	DeBarse	Assoc	Emu Plains
PA	Head	Assoc	South Windsor
MJ	McNeill	Assoc	Cherrybrook
SH	Mills	VK2UMI	Marrickville
WA	Phillips	Assoc	Kingsgrove
MR	Ramsay	Assoc	St Clair

Divisional Voice Mailbox

A few months ago the Division received an offer from AAP Communications, Sydney, to provide the Division with an experimental voice mailbox. This may be accessed by telephoning (02) 552 5188. Each week a summary of the VK2WI broadcast is placed into it.

From any phone you can dial in, hear the report and, if you like, can leave a message by following the instructions given.

If you have no message, just hang up at the end.

If your phone has DTMF facilities or you have a separate tone sender, you can access additional facilities, as follows:

Rewind 10 seconds	Press 1
Rewind to start	Press 1-1
Pause or restart message	Press 2
Advance message 10 seconds	Press 3
Skip to end of message	Press 3-3
Slow down message speed	Press 4
Speed up message	Press 6
Increase volume level	Press 9
Reset volume level	Press 8

Improvements to 23cm Repeater

A couple of years ago the Division received a donation from Dick Smith Electronics of equipment to establish VK2RWI on 23cm. It has operated on a pair of small antennas on the main tower.

The Division has just received a further donation from DSE of a pair of high gain vertical antennas which will replace those currently in service. Our thanks to Dick Smith Electronics for its support to the amateur radio service by way of these donations to the Division. ar

QSLS FROM THE WIA COLLECTION

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139. PHONE: (059) 64 3721

Korea – Land of the Morning Calm

Since the Korean war, Korea has become quite well known to the majority of Australians, whereas before the 1950s little was known about the country except perhaps that it occupied the large peninsula that jutted down from the Asiatic mainland towards Japan.

Almost the area of the State of Victoria, Korea consists of two separate entities, the Republic of Korea, commonly known as "South Korea" and the slightly larger Democratic People's Republic of Korea, referred to as "North Korea" separated at the 39th parallel of latitude. It had been secretly agreed at the Yalta Conference that US forces would accept the surrender of Japanese forces south of this line of demarcation, the Russian army doing likewise north of this line. Now, despite the costly Korean War of 1950-53 in which a million lives were lost, the situation remains exactly as it was planned (as a temporary adminis-

trative measure) before World War 2 had ended.

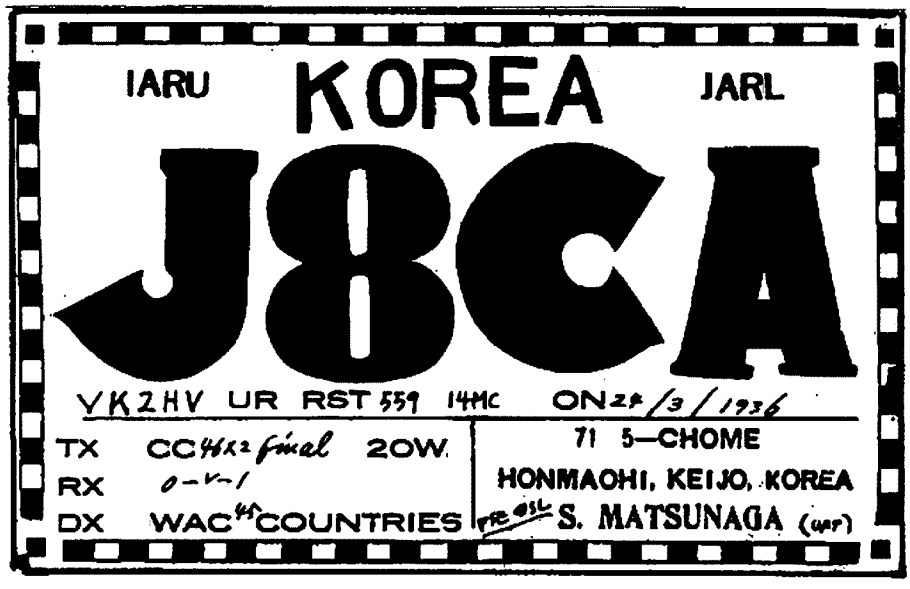
The letter "J" has always been associated with Japan in callsign listings, the *Year Book of Wireless Telegraphy* of 1915 setting down the ITU's allocation of the letter to "Japan and Possessions". The 1920 edition of the same publication gives the more precise allocation of JAA-JZZ. The magazine *"Radio"* of Jan 1937 gave the ARRL listing of "Chosen (Korea) as J8. (At about the same time, J9 was allocated to Taiwan and J1-J7 to mainland Japan). In Jan 1940 (the US was not then at war), the publication *Radio* gave the listing Chosen (Korea) as J8C. No prefixes were published in the major radio magazines after 1941, with the exception of the prefixes of the USA and its possessions.

J8CA

There seems to have been only a few amateur radio stations active from Korea before World War 2. The WIA Collection contains QSLs from J8CA (as shown) as well as those of J8CD. These were probably the most active stations in Korea at the time. On some of their cards we read the QTH as "Korea, Japan" the Japanese having annexed the country in 1910. There is little doubt that the Japanese developed both the agriculture and the industry of Korea for their own use, little thought if any, being given to Korean aspirations. In fact, from 1941 occupying authorities even banned the Korean language, insisting that all Koreans learn and use Japanese. On one of the J8CA QSLs the QTH is given as "Chosen, Japan". Chosen is the Japanese for Korea and this name frequently appeared in DXCC country listings both before and after the liberation of the country.

After the cessation of World War 2 hostilities, US forces in South Korea reactivated the former J8 prefix. The WIA Collection contains the QSL card of Korea's first post-war amateur station. This was W20AA/J8, the card being dated June 1946. It was sent from Sgt Harry Paston of the 7th Infantry Division, US Army. The allocated calls all have the prefix J8A, and none was allocated to Korean nationals. QSLs held by the WIA include J8AC5, J8AAJ, J8ASC, J8AAK, J8AAR and J8AAA. (Sig Corps Station in Seoul).

In 1948 the J8 calls were discontinued being replaced by the prefix HL. Current stations dropped the first letter after the number but retained the remainder of the callsign suffix. (*QST*, April 1948). Station J8AAK became HL1AK (Altered QSL in WIA Collection dated March 1948) whilst J8AAR, also quite active, changed its callsign to HL1AR. (Date of altered QSL April, 1948). The May 1948 edition of *QST* stated that the HL calls were allocated by the General HQ of the Far East Command in Tokyo to both enlisted personnel and civilians attached to US Army forces in Korea who held amateur radio licences. All calls were assigned from the series HL1AA through HL1ZZ, the ITU conference at Atlantic City in 1947 having allocated the prefix block HLA-HMZ to Korea.



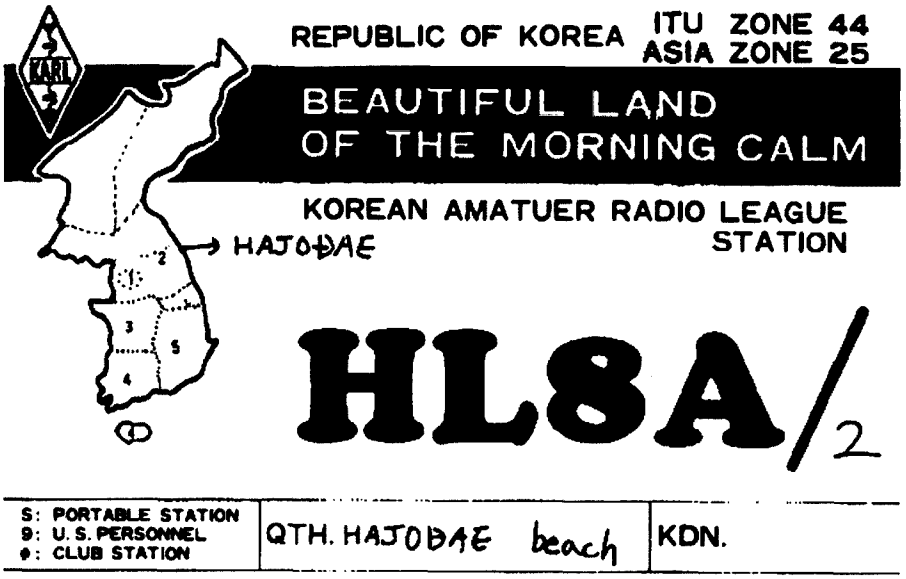
The Feb 1951 edition of *AR* gives an interesting account of amateur radio activity in Korea upon the outbreak of the Korean War. Station HL1CD in Pusan was the first participant in the emergency and was contacted with the message from Seoul to clear the Pusan airfield after regular communications had been cut. With HL1US in Seoul the two stations maintained a vital link with General MacArthur's HQ in Tokyo. The WIA Collection is fortunate in possessing the QSL of station HL1CD in Pusan. The QSL is dated February, 1950 just a few months before Communist forces in the north swept down to take almost all Korea except for a very small area in the of the south-east of the country being stopped at what was to become known as the "Pusan Perimeter".

From 1 August 1960 the HL prefix changed to HM, the KARL (Korean Amateur Radio League) HQ station HL9TA becoming HM0HQ. The HL2 prefix had been issued to experimental stations which were not permitted to operate outside Korea, whilst the prefix HL9 was retained by US personnel. It is interesting to note that despite this general allocation, the call HL9TA was granted in the late 1950s to the KARL, being the first call assigned to Korean nationals There were five licensees operating the station, including a YL. The station ran on 50 watts and transmissions were on phone only. For Korean nationals, the prefix HM9 was issued for portable operation (eg the portable KARL station HM9A operated from Cheju Is in 1960

and from Dok Do Is in 1962) The prefixes HM1-HM5 reflected the geographical areas of South Korea, whilst HM6 and HM7 were reserved for North Korea upon reunification. HM8 was a novice type prefix and HMO was reserved for clubs.

The special "Club" prefix, HM0 is especially allocated to university and college radio clubs together with special stations such as the Boy Scouts, HM0S.(See *AR* Jan, Feb 1991 for an account of the Movement) The HM0U QSL shown was sent to "STK" Roy Jonassen VK4NE in April 1981 from the Seoul National University ARC.

After 1982 this HM prefix reverted to the former HL prefix. The reason for the change lay in the fact that the ITU had allocated the prefix block of HMA-HMZ (as well as P5A-P9Z) to North Korea.



HL8A

The fairly uncommon prefix HL8 is currently being used by Korean stations operating portable. It is one of a series of prefix changes for portable/mobile stations. HM9 was used in the 1960s and '70s, HM8 for a brief period only in the early 1980s and HL8 from 1982. The HL8A QSL is special in that it is the portable call of the KARL whose general callsign is HL0HQ

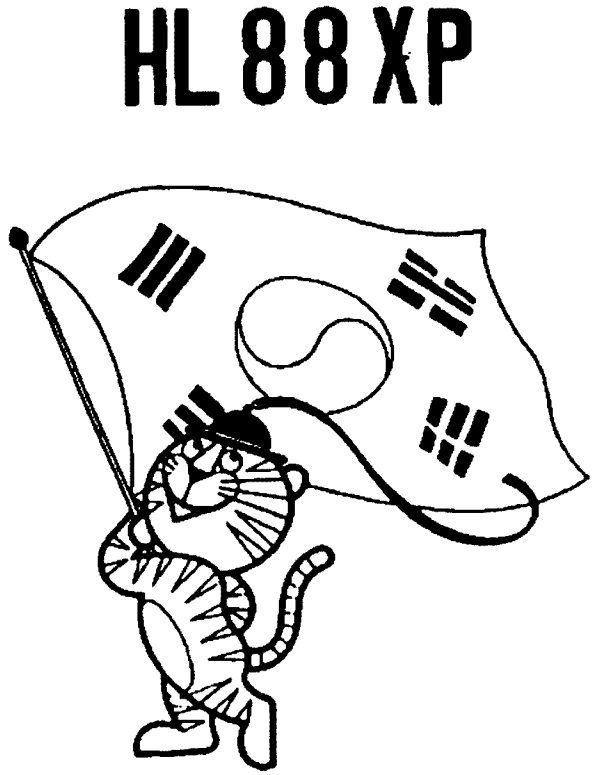
The QSL shows the geographical areas corresponding to the South Korean prefixes HL1-HL5 (The city of Seoul itself is HL1) as well as the epithet "Land-of the Morning Calm" -actually a translation of the now disused title "Chosen" but an apt description of a land of high mountains, sparkling streams and gentle people.

HL88XP

The Summer Games of the XXIVth Olympiad were held in Seoul. (See *AR* July, August 1990 for the story of the Olympic Games through QSL cards). South Korean stations were permitted to use the prefix HL88 during the period 5 Sept-5 Oct 1988 to commemorate the Games. The KARL HQ station HL0HQ used HL88HQ whilst the station HL1XP used the call HL88XP (as shown). On this QSL is shown the Korean flag. This has a white background (representing peace and the traditional Korean white clothing), and in its centre we see a "T'aeguk", two pear-shaped figures intertwined which represent the interaction of forces in the universe. In each corner of the flag are four "Kwae" which correspond to the four seasons, four cardinal directions and the sun, moon, earth and heaven. The flag, based on the original 1876 flag (following the ending of the country's isolation from the West) was formally adopted in Jan 1950. The QTH Seoul is the South Korean capital city, having a population of over 10 million. It lies only about 50 kilometres from the de-militarised buffer zone to the north.

Amateur radio activity from South Korea has been considerable except for a brief period in the 1950s during which radio contact with the country was banned (This ban was lifted in October, 1957). Such activity has been due to the presence of US personnel and the particularly large growth in the number of Korean stations, especially clubs operated by Korean nationals One is surprised at the particularly high quality and variety of QSLs emanating from the KARL bureau in recent years.

Reports of contacts with stations in North Korea using the allocated Ps, P9 prefixes have continued throughout the 1980s and into the 1990s, but the status of such stations (if not piratical) is unknown. Many DXers are hopeful of the granting of new DXCC status but the attitude of Government to amateur radio licensing in that country must first be determined. Only as recently as July 1991 the South Korean President, Roh Tae-woo told President Bush that he hoped to see the two Koreas reunited before the turn of the century. Hopefully we will be in QSO with the Democratic People's ROK long before that time.



Thanks

The WIA would like to thank the following for their contribution of QSL cards.(supplementary list)

Ken	VK5IT
Jim	VK9NS
Mike	VK6HD
Pat	VK3ADN
Wally	VK3MJ
Marilyn	VK3DMS
Vic	VK5AGX
Dick	VK3ABK
Stan	VK3TE
Ken	VK3WM
RObin	VK6LK
Harry	VK4KW

Also, the friends and family of the following "silent keys" (supplementary list)

Harry Jupp VK2AJU
(courtesy of Graeme VK2GJ)
Jack Bailey VK4JC (courtesy of VK4AZ)
Jim Brinkman VK2IS
Alex Murray VK2FM

DX QSL Contributors' Ladder 1991

Mike	VK6HD	164 points
Jim	VK9NS	56 points
Steve	VK3OT	30 points
Robin	VK6LK	29 points
Mavis	VK3KS	17 points

If you, the reader would like to play a part in contributing to the WIA Collection, please contact the writer of this series of articles.

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CLUB CORNER

Shepparton 1991 Communications Day

The 1991 Shepparton Communications Day will be held on Sunday 22 September. The event is organised by the Shepparton and District Amateur Radio Club. After a break last year the club is out to make this event the best yet.

A wide range of the newest items on the amateur shopping list will be on show as indicated by the positive response received from traders and distributors. There will also be displays which do not relate directly to amateur radio, but which will prove interesting to all.

Dust off that surplus and unwanted gear, as there will be plenty of room to help you dispose of it. You may wish to drive your trailer up and sell from it in our undercover parking. First in, best dressed, in this area.

As many amateurs travel from Melbourne and interstate, it has been decided to upgrade the catering. A sit-down meal will be available for those who wish to participate.

Keep an ear on the Thursday night club broadcast on VK3RGV 146.65MHz at 8pm local for more details. Any traders who have not been contacted and may wish to participate can contact the club by mail, PO Box 693, Shepparton 3630.

Shepparton is located on the Goulburn Valley Highway, 180km north of Melbourne. Mark it in your diary now: Shepparton's Communications Day, Sunday 22 September.

Old Timers Club (SA)

VK5 Old Timers' Luncheon will be held at Marion Hotel, Marion Road, Mitchell Park on Tuesday 29 October 1991 from 12.30pm (pay as you go as last year). Ladies' Luncheon will be held at the same time.

RSVP 15 October 1991 for catering.

Please notify Ray Deane VK5RK 271 5401, John Allan VK5UL 344 7465, or Jack townsend VK5HT 295 2209.

For those travelling by bus, catch No 243 in King William Street (stop 24).

Southern Electronics Group

From 28 September to 11 October, Albany, Western Australia will be celebrating the 200th anniversary of Vancouver's landing, when he claimed possession of the western part of Australia in the name of the British Crown.

Amateurs in Albany will participate and mark the occasion by operating the club station of the Southern Electronics Group on all bands (and a variety of modes) during the period of the celebrations. The special event callsign VI6SR is hoped to be used, and a suitable QSL card will be sent to all amateur stations which QSO with the club station.

The amateur fraternity of Albany look forward to working you during the celebrations. Please call in.

Bevan Lang VK6VX
Hon Sec
c/- PO Box 738
Albany WA 6330

Townsville Amateur Radio Club (Inc)

North Queensland Radio Convention 1991, James Cook University, Townsville, 27, 28, 29 September.

Convention Information

Venue: The Convention is held at the Western Campus, James Cook University, located approximately 11km from Townsville City Centre in the foothills of Mt Stuart.

Transport: There is no public transport out to the campus, however TARC members will gladly help delegates with their transport needs.

Accommodation: Billeting with friends is popular, as many avid conventioners use the weekend to catch up with what is happening up in the north. There is also accommodation available on campus at a cost of $42.50 per person per day, which includes full board and morning and afternoon teas and lunch.

Registration: Final date for return of the registration forms and payment is 21 September 1991. If you are going to attend such functions as the buffet dinner, then registration before the final date is essential to ensure your participation.

Contact Info: A watch will be kept on the club's Mt Stuart repeater VK4RAT 146.7MHz up to and during the convention weekend. If you find you need information ... yell for it! For information up to the convention weekend contact Peter Harding VK4PVH (077) 79 0300 BH, (077) 73 3487 AH; Roger Cordukes VK4CD (077) 79 0266 AH, (077) 74 0211 AH; Bob Mann VK4WJ (077) 81 4450 BH, (077) 79 7869 AH; Gavin Reibelt VK4ZZ (077) 74 1102 BH, (077) 79 1161 AH, or write to the Secretary, TARC (Inc), PO Box 964, Townsville Qld 4810. Or grab a TARC member on the air or in the street!

Daily Highlights

Friday 27, evening: 1930-2200 the Greetings Evening. Informal get-together at the Newpark Hotel. Drinks at bar prices, light supper and nibblies provided.

Saturday 28, morning and afternoon: From 0800 open for convention registration * radio-sporting activities * car park treasure bazaar * trade, home brew and demonstration displays * at 1300, official opening by John Nutting, manager ABC Radio 4QN Townsville * technical lectures by Keith Kikkert * ladies' magical mystery tour.

Evening: buffet dinner at the Showground Function Rooms with music provided by Thunderbolt, the band of renown, along with the famous Amateur Hour.

Sunday 29, morning: from 0800 * more radio-sporting activities, trade, home brew and demonstration displays * at 0900, WIAQ news rebroadcast and call-in sessions * ladies visit to attack the local markets * technical lectures by John Nichols * judging of the home brew contests * presentation of trophies.

Afternoon: the legendary NQ convention auction * more radio-sporting activities, trade and demonstration displays.

Special Attractions

Amateur Hour: So you thought that radio enthusiasts only dabbled with that boring radio stuff! Be part of it, too! Get out those glad rags and put on a voice and be in the famous Saturday Night Amateur Hour.

Sunday Auction: The Legendary NQ Convention Auction! Will you be one of many to score the find of a lifetime? Will you have to leave the kids behind to make room for the booty? Bring a loud voice and lotsa dBs.

Car-Park Bazaar: So it hasn't been called

JUNK yet, but you still have to make room at home for all the good gear you will get at the Sunday Auction. Load it into the boot of your car and participate in the Saturday Morning Car-Park Bazaar. The only rule is that nothing is left on site when the bazaar ends!

Technical Lectures: The finest minds in the form of Prof Keith Kikkert and John Nichols will spellbind you with insights of the world around us, and how those discoveries are put to use on a day-to-day basis.

Radiosporting Activities: If you don't know what Radio Sporting is all about, then you will get a fair idea at the convention, participating in the activities and iwth an active demonstration by the TARC RadioSporting team that recently competed in China.

Trade Displays: Exhibition of some of the finest radio equipment and services available in Australia, with some of the displays providing hands-on working participation.

WIAQ Bookshop: Bring your money with you for, apart from the Saturday Auction and Saturday Car Park Bazaar, the Bookshop is one of the more popular places to displace dBs at the convention, and is well stocked with popular references.

Ladies' Activities: Apart from activities away from the convention site, the ladies are well catered for by a very active Ladies' Convention Group, keeping you well entertained while you keep control of hubby's spending urges.

Homebrew Contest: Bring along that gizmo you've made out of recycled bits, it might win you a prize! Entries open to all attending, with sections being Technical, Non-Technical, Ladies, Children. The entries don't have to be high-tech or expensive; winners can be simple yet ingenious.

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SPOTLIGHT ON SWLING

Robin L Harwood VK7RH
52 Connaught Cres West Launceston 7250

Well, spring has arrived by now. Already the propagation has altered and the higher frequencies are coming in later in the evenings. Daytime propagation of HF signals from Europe is dropping off around midday until later in the afternoon and early evening. Don't forget that Continental Europe will go off Daylight Time on Sunday 29 September. This will mean that directed programming to audiences there will be aired one hour later.

Also, the USSR will revert its local time by one hour on the same date. This European summer, the Soviets did not have Daylight Time because they suddenly realised that Stalin had introduced Daylight Time in the '30s, but had forgotten to revert the clocks. In effect, they were on double Summer Time when the USSR reintroduced Daylight Time in the '70s. That is why the alteration has been made.

While we are on Daylight Time, it appears as if some sanity has at last arrived here in Australia. It now looks as if we are going to have a standard date for the commencement of Summer Time in VK. The Tasmanian Government has legislation that would mean the earlier implementation of it - early in October until late in March, which is out of step with the mainland states. But I believe that federal legislation is presently before the Senate which will override state legislation, and it does seem that we will all have the same period of Summer Time. VK8 will be coming on to it, after remaining on Central Standard Time. Yet, some trans-Tasman travellers are going to be confused in October, because NZ will introduce Daylight Time earlier than in Australia.

Recently, I have made a cautious return to 27MHz CB, after 15 years absence. I obtained an AM/SSB Super Jaguar Mark II from a family member's mobile that was no longer required. I have, from time to time, occasionally monitored 27MHz on the Icom, but have not had the inclination to go up there, ever since it was taken away from us in 1977. Fifteen years on, things haven't changed too much, although the personnel have.

The reason that I have returned to 27MHz is that our local WIA branch has commenced a novice course, using the Gladesville Amateur Radio Club videos. Many of the course attendees come from the CB ranks. This was due to the enthusiasm of one of the newer CB operators, who had other CBers doing the course. Therefore, I have found it has been very useful assisting them with the theory via CB in between classes.

It has been an interesting experience back on 27MHz. There are genuine people there, who are only too willing to learn and upgrade to the novice licence. Sadly, there have been isolated instances where other operators have delighted in denigrating and ridiculing amateur radio on air. Fortunately, they are in the minority, albeit a vocal one. But, it should be remembered that 27MHz CB is not amateur radio, being a public access band. Yet, it could still be a good recruiting ground for prospective candidates for amateur radio.

Now for some DX news. I recently came across the External Service of Radio Bangladesh in English. It was on 15208kHz at 1230 UTC. The modulation was poor and the signal was hard to separate from nearby channels. Reports indicate that the station is erratic in operation, so it may not always be there. It may also vary in frequency, as they announce that they are on 15200kHz, so you may have to tune around that channel to find it.

Well, that is all for this month. Until next month, the very best of DX and 73 - de VK7RH.

ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Help Wanted

I am a WWII signaller who collects and restores military visual/line and radio equipment as a non-remunerative hobby.

Sincere thanks to the many amateurs and members of signals organisations for their help, especially with information and manuals to restore equipment to its original condition.

Although I have tried, I have not been successful in obtaining the following information, which is badly needed to speed restoration, or for the operation, of some units.

1. **Parts List** for Australian Army 128 manpack battery operated wireless set 2-4.5MHz. The sets I have have been heavily tropic-proofed, and component values are difficult to read. Sets were probably made by Radio Corporation Melbourne in 1946.

2. **Details and circuit** of PRC10A, 12V DC(ds) transistorised power supply. The PRC10A is a US Army manpack battery operated wireless set 38-55MHz FM. It was used by the Australian Army in 1960/70. The 12V transistorised supply is mounted in a case that clips on the bottom of the set in place of the normal batter case which holds the 1.5V and 135V batteries. This supply could be a special made in Australia.

3. **Operating Instructions** for approximately 150mm Navy type Aldis signalling lamp (lantern Admiralty pattern o 5110D). The lamps use a trigger operated tilting mirror to signal in Morse. The lamps are lent from time to time, and I wish to conserve the small quantity of bulbs I have (12V 36W) by proper handling.

If someone could help me, I would be very grateful.

EVAN FELL VK4EF
97 JUBILEE TCE
BARDON QLD 4065
PH: (07) 366 1803

Murphy or Marcolins?

Congratulations to *RAAF Williams (alias Laverton) and its amateur radio club VK3APP on their valiant efforts to communicate with STS-37 "Atlantis" (*AR* June 1991, pp 22-23).

The article warmed the cockles of the hearts of those of us who battled with AT5-AR8s or the RAF equivalents, in a variety of aircraft types.

Obviously Marcolins are still with the communicators.

Ignorant pilot types and non-W/T erks can brush up on the subject by referring to four articles in TEE-EMM-Volume III p173, p231, Volume IV p18, p76.

The sugar-coated pills labelled "mind your Marcolins" may have less application in these days of solid state, but the underlying principles still apply.

ALAN GARDNER VK4BWG
40 WATTLE AVE
BRIBIE ISLAND 4507

It's Worth the Effort

Re: Morse Code (Morse is really easy; you only have to listen to it)

Well, you all do not know what to expect if you drop the Morse code.

You will be swamped with CBers wanting to have a bit of fun. Without Morse code, examinations will be too easy, and you lose a good filtering medium.

Many of you are ex-Signal Corps members or amateurs brought up by some other amateurs and do not really know what's going on 27MHz today.

Well, I know, because I graduated from CB to my licence, and I know which remarks regarding today's examinations are made and why only the keenest are deciding to go for amateur licence - Morse is the answer why yahoos and those who only want to have fun do stay away.

I am not an electronic person at all, and I am not interested in repairing, modifying or experimenting with radio equipment. I just want to operate and have DX contact with my friends in Europe. But to have that, I just about learned the whole of Fred Swainston's book from back to front to get my licence. Theory is very hard and a huge obstacle for me, but I still want to get my full call also. So I am still doing the same thing, and I am not complaining about how hard it is, because if you really do want something, you'll get it.

So, for all of you who complain how hard is the Morse code, for goodness sake, stop complaining. Sit down on your rear end and start listening to the Morse, and you'll get there.

THOMAS KNOPP VK3MEY
PO BOX 454
NOBLE PARK 3174

More on Amalgamation

I wish to say a few words re the amalgamation of *Amateur Radio* with *Amateur Radio Action*.

I am totally opposed to such a move. In my opinion, the magazine *Amateur Radio* is the Institute's way of keeping the members informed of ham news and activities, as not all of us can listen to the various Sunday morning WIA broadcasts.

I realise, of course, that unlike broadcasts, the magazine cannot be used as a calendar for forthcoming WIA activities at short notice.

I have been a member of the WIA since 1947, and to think of a possible amalgamation with another magazine would be a very backward step.

The magazine plays a very important part in WIA activities, and it is essential that it remains the Institute's monthly publication.

The magazine has really developed over the years.

LONG LIVE *AMATEUR RADIO*.

MAC HILLIARD
12 JARRETT ST
CAMPSIE 2194

Memories of the War

I am very pleased with the way the magazine is going, and the choice of material.

I have so far built up a little impedance bridge and SWR meter with great delight, and have made good use of these two devices in restoring four of my FT200s.

I am also writing for my father, who was with 2/11th AIF through the Middle East, and then on return New Guinea and then went on to M/Z Special Forces.

This involved work through the Solomons and with the Krait - sub Swordfish etc, etc.

My father lost many of his men, lived off virtually nothing for months on end and was, in most cases, not allowed to make contact with the Japanese.

They had to relay important information only, and they had to carry heavy radios up and over very high mountains through the night, with many casualties.

In one case, 38 men went on a mission, and not even half were picked up when the subs and Catalinas returned.

But the main thing is, my father survived and is very pleased and grateful that your magazine has remembered their efforts in keeping Australia free from what other countries suffered in WWII.

MAURIE STONEHOUSE VK6NST
AND FATHER
SYDNEY STONEHOUSE
140 MEDINA AVE
MEDINA 6167

(May we hope that because of the sacrifices of men like your father the world may never again suffer as in World War Two. Ed).

Skydivers

Referring to "The Balloon Goes Up" July *AR* p25. A very knowledgeable and interesting article. However, marred a little perhaps by the part about the parachute back to earth ("not packed like a skydiver's chute!!").

The article was shown to a few skydivers and, yes, "the balloon did go up".

I think your correspondent should stick to technicalities and leave the so-called funny bits to comedians.

DOUG FOWLER VK4AVR
50 RYHILL RD
SUNNYBANK HILLS 4109

Amalgamation?

I am interested to read that it has been suggested to you that *AR* should amalgamate with another magazine. I write to say that I do not think such an amalgamation would be a satisfactory long-term solution to our problem.

An organisation of which I have been a member since 1950 and which has published a monthly bulletin since October 1973, had 22 issues published as part of a commercial magazine in the 1948/50 period. This experiment did not prove satisfactory and the organisation returned to publishing its own bulletin as before.

Our object is to increase membership and what is published in *AR* is "preaching to the converted".

I put forward the suggestion that a series of articles be prepared covering the history of the WIA itself, with particular reference to, and emphasising, the successes WIA has had in dealing with national and international problems to the advantage of the Australian amateur, and also to the failures due to lack of membership. These articles to be published in other radio magazines such as *Electronics Australia* and *Amateur Radio Action.*

I know that block advertisements appear in those magazines from time to time, but I fear no one bothers to read them and, in any case, they do not make enough of the advantages of membership.

I spoke to Bill Roper along these lines at the NSW Divisional Dinner on 28 June.

A Franklyn Pain VK2DYP
16 Opala St
Belrose 2085

Local Book Source

Copies of *QTC* (I have a message for you) are available in Australia through A H Sandilands VK2BS, 10 Nelligen Place, Nelligen NSW 2536 at $A27.80, softback, and $A35.20, hardback, in each case, plus postage for parcel of about 900g.

This avoids the inconvenience and costs of organising international drafts through banks, or international money orders through post offices. And delays involved in the book coming through from the United States by mail.

Ian D Compton VK5KIC
9 Craig St
Richmond 5033

CB and Amateur Radio

Just a few lines of encouragement for the Sydney Radio Group VK2SRG; at last one club is dong something constructive, combining CB and amateur radio activities together in the same club.

I have spoken to my fellow amateurs many times that this sort of involvement should be adopted by amateur clubs; however, the Sydney Radio Group has started in the reverse, but still with the same objective. Congratulations.

This is most certainly a good move. For example, using the figures provided by VK6NE June issue, "DoTC statistical summary for March 1992", 19,392 amateurs, 418,551 CBers. Now, if only one half of a percent of licensed CBers joined the ranks of amateur radio operators, they would swell our ranks by 10 per cent; not a bad increase. These are only conservative figures.

Now, before all you knockers put pen to paper, stop and think carefully, where did you and your close amateur friends progress from?

Chris Peake VK3XCP, VCJ342
3 Goulburn Court
St Albans 3021

More for the Disabled

Thank you for publishing my article on Steven Frith (June *AR).* It has given me great pleasure showing it to my friends.

I received letters from two readers of the article, VK4LR Rex Newsome, and VK2DVH Jack Heath, and have had further interesting correspondence with them both.

Would you be interested in a series of follow-up articles on Steven Frith? They would include details of communication difficulties and problems encountered, and the way these were solved with a computer, and the eventual changing over to a speech processor. The method of operating a computer with a single switch required some unusual programming routines, and these could be interesting to computer programmers and also to those who may wish to help the disabled.

The amateur movement has a large pool of skilled persons who can help the disabled. People with communication and computer knowhow, retired people with time on their hands and the ability to use their hands to make specialised items that cannot be bought off the shelf. It can be a wonderful challenge, helping the disabled, and each case undertaken is so different. There are no monetary rewards, only a very special satisfaction that cannot be measured in money. It is for these reasons that I wish to let your readers know about the work we are doing. As for myself, at 81 years of age I feel that my remaining years are being very well spent.

Karl Saville VK5AHK
1290 North East Rd
Tea Tree Gully 5091

(Thank you very much, Karl, for the promise of further articles. We look forward to seeing them. Ed)

VK4 Slow Morse

Thank you for printing my letter attempting to correct the timetable for Slow Morse transmissions in VK4 *(AR* August 1991). You did print what I sent word for word, except for one line. Astute readers would have wondered why TARC has two callsigns - not so - that line should read:

Wednesday Central Highlands Amateur Radio Club VK4WCH

However, just when we are starting to get it right, there are changes in the wind . . . The possibility of a new station, and the coming once more of the dreaded Daylight Saving! So, devoted followers of the VK4 Slow Morse sessions, drop in on 3535kHz around 8pm on Monday, Wednesday, Thursday or Sunday, and ask the operator on duty for the latest update.

Sally Grattidge VK4MDG
VK4 Slow Morse Co-ordinator
Townsville 4810

Magazine Future

Reference your July editorial about *AR* amalgamating with a commercial magazine. That must never happen; we can and must survive as an independent non-profit organisation. *AR* must not become a media subsidiary.

Ray Jones says we must be "market driven" - we are "driven" by our members, who number 41 per cent of the Australian radio amateur population. That is our real performance indicator; indicating what those 10,000 non-members think of us - our service, our officials, our members as a group, and our members as individuals.

Sure, our business performance is good - the *AR* production operation is financially good, using only 37.5 per cent of our subs income. Does the quality of *AR* content impress non-members? What happens to the other 62.5 per cent of subs income?

One division has a remarkable business performance for a non-profit service organisation - soon it will not need subs income and could even stop pretending to provide service. *(Would you care to elaborate, Lindsay?* Ed)

We have reason to be proud of our successful operations, but it is not what we think of ourselves that counts. What does that 59 per cent think? Why don't we ask them? Invite their comment, suggestions and articles for *AR.* Don't threaten them with extinction if they don't join us; we need members who want to be members, not conscripts. *(Hear, hear!* Ed)

Lindsay Lawless VK3ANJ
Box 112
Lakes Entrance 3909

Amalgamation Again?

Amalgamate with (translation: "be swallowed by") *ARA?*

Not "My Fair Lady" likely!

I'd sooner see us amalgamate with *Women's Weekly!* Throughout its short history "that" magazine has taken shot after shot at the WIA, most of them unwarranted, all of them spiteful. They want *AR* out of the field so they can have a monopoly. I've worked in the magazine industry, and have studied many publications in radio and other fields. Amalgamation such as "The Jones Boys" advocate will see *Amateur Radio* die a not very slow death.

First, it'll be a 16-page liftout; then, in a few short months, eight pages, and eventually it'll be stuffed away at the back of the magazine with perhaps one page only.

What became of the rumour that we were negotiating with *Electronics Australia*? If we must join forces with someone, let it be that magazine.

It has always had a sympathetic attitude towards our hobby, has had (and still has) many VKs on its staff over the years, and amalgamation with that prestigious publication would be a feather in the WIA's cap ... not an abject surrender to a vicious competitor.

Amateur Radio is not without its faults, but at least it is the voice of the WIA.

HARRY ATKINSON VK6WZ
5/97 RAILWAY PARADE
MT LAWLEY 6050

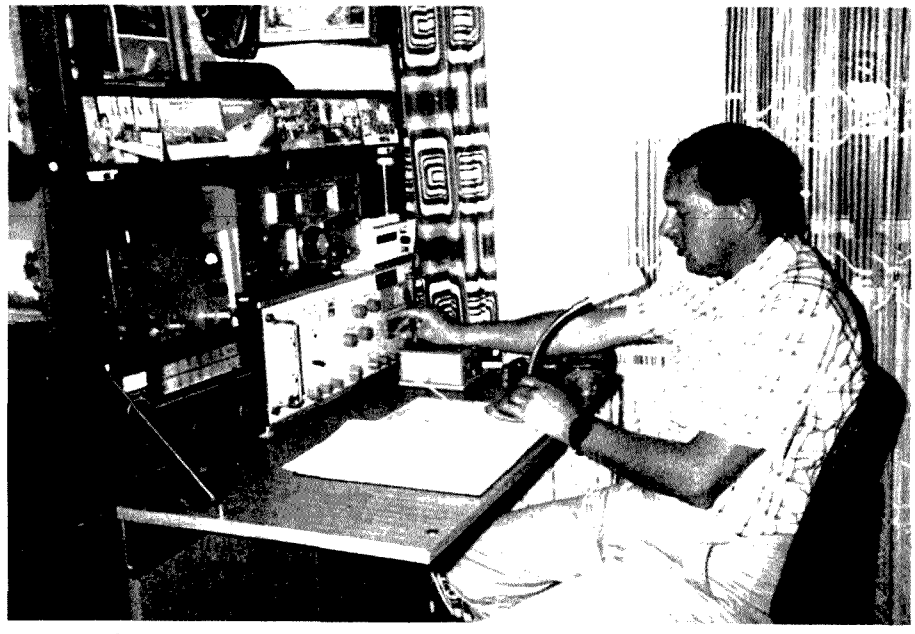
Thanks from Germany

During my trip around the world from 18 October 1990 to 2 April 1991 I visited Australia for about 10 weeks from 15 Jan to 28 March 1991.

In all my years of activity I had worked more than 1000 different VK stations, so I had many friends there. It was a great pleasure for me to see so many of my old and new friends in VK in person. Sorry I could visit only VK2, 3, 5, 7 and 8, but in all places I had a very warm "welcome", and the time was gone so quickly.

It was very interesting for me to make QSOs, especially with Europe, from this part of the world under my guest licence call VK3ETA. Special thanks to Walter VK3DFO, who helped me to get the licence, and also to George VK3LA, from whose station I could work my skeds with Germany.

I wish my friends in beautiful Australia all the best. I look forward to many more good QSOs, and I hope to visit VK again soon. Many thanks to all!



DF4DI (also Y24EA) Op: Gun; QTH: Rostock/Baltic Sea

GUN DF4DI, VK3ETA & Y24EA
GÜNTHER KOCHNIß
STEPHAN-JANTSEN-RING 26
2520 ROSTOCK 26
GERMANY ar

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

Tom Coakley VK3IU

T J Coakley spent a lifetime on the engineering side of aviation. He did his "apprenticeship" with the RAAF at Point Cook in the early 1920s, and then went to Adelaide where he was with early aviation companies at Parafield and the Aero Club of South Australia.

In the 1930s, with Guinea Airways, he specialised in Lockheed 10s, 12s, and 14s. At times, he acted as radio operator on Guinea's aircraft on the Adelaide-to-Darwin run and was known to operate airborne mobile on 7MHz. He held the call VK5UK from the early 1930s.

In the late 1930s, he moved to Melbourne, became VK3IU, and joined Australian National Airways in an engineering capacity; then to the Department of Aircraft Production during the War. He joined Trans Australia Airlines very soon after its formation (1946) and spent many years with TAA on the procurement of new aircraft until his retirement.

Tom was a very active fellow for his age and, after TAA, joined Ansett Airlines of Australia dealing with aircraft maintenance matters. In his latter years, he was an aircraft accident assessor for an insurance company.

Tom was a CW man, and the call VK3IU was rarely heard on phone during the 52 years he held the call.

Tom Coakley died on 27 June 1991 at the age of 87 years.

VALE, DIT DIT DIT DIT DAH.
VK3PF AND VK3TJ.

Don Thornley VK5NOD

With sadness, I write to report the passing of our dear friend Don VK5NOD. Don passed away on 22 March 1991 at the age of 56, following a short illness.

Don opened his station with his novice licence on 4 February 1980, followed by his attaining a limited licence several years later.

He enjoyed contests, DXing and a good ragchew on the 15 and 80m bands.

He was a member of the WIA, and a member and past president of the South East Radio Group (SERG).

Don will be sadly missed by his wife Mary, family and his many friends.

GRAHAM D ROESLER VK5YM

Mr A Hartley	VK2ALI
Mr B I Henderson	VK2DFH
Mr I Hands	VK2IBH
Mr R B Russell	VK3BR
Mr T Coakley	Ex VK3IU
Mr S Maidment	VK3DCA
Mr S Manhire	Ex VK3PJX
Mr B Wishart	VK4WX
Mr E Wissemann	VK4ADA
Mr R K N Wilkins	VK5AUR
Mr K Ring	VK5KH
Mr J Kitney	VK6AV
Mr J Vogel	VK6BA

Please note: Mr Jack Trevena VK2APT was wrongly listed as a Silent Key in the August issue. Our apologies to Jack, and we regret any distress or embarrassment caused by our mistake.

Stephen Maidment VK3DCA

Steve died on 17 July 1991.

He was a tireless worker for St Leonard's College where he was a teacher, and for the local Scouts as leader of the 7th Cheltenham Troop. Through the Jamborees-on-the-Air which he organised, some 20 local Scouts and leaders have gone on to gain their amateur licences.

Steve was active on VHF packet and phone, and would often be heard chatting with his

father Len VK3NJE on the local repeaters. To Len and his wife Wilma, on behalf of Steve's many friends in amateur radio, I offer my condolences.

An exceptional young man who would give freely of his time to any who asked, Steve will be greatly missed.

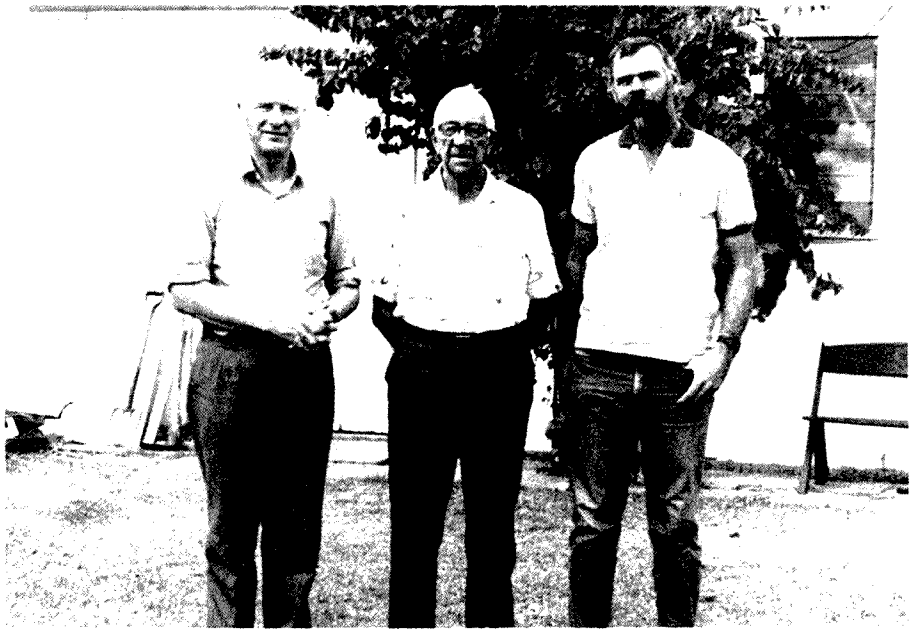
CRAIG McMILLAN VK3CRA

Jack Kitney VK6AV

Born 10 January 1904 - Died 19 July 1991

At the age of 14, Jack became interested in things electrical, and later in the then newly talked-about radio. In 1924, he was receiving the old 6WF transmissions on a crystal set, using a long-wire antenna. This was considered marvellous, as his location was some 170km to the south of Perth. His interest in obtaining an experimental licence was interrupted by the declaration of war in 1939, and it was not until July 1949 that he came on the air with the call VK6AV. He was very interested in CW operation, and was later amongst the earliest to change over to SSB. However, he maintained a balance between the two modes of operation.

His livelihood was that of an orchardist, and he went into retirement at about 60 years of age to further pursue amateur radio and fishing. He was also an accomplished musician with either the violin, or saxophone - which he preferred. Jack's XYL predeceased him by two years, and he leaves two sons. One son is Vic VK6BK, and a grandson Roger VK6VK.



Three generations of the Kitney family. L to R: Vic VK6BK, the late Jack VK6AV and Roger VK6VK. Photo taken in June 1989.

VIC KITNEY VK6BK. ar

HF PREDICTIONS

ROGER HARRISON VK2ZTB
GENEROUSLY SUPPLIED BY THE APOGEE GROUP FREE TO THE WIA

The Tables Explained

The tables provide estimates of **signal** strength for each hour of the UTC day for the five bands from 14 to 28 MHz. The UTC hour is the first column, the second column lists the predicted MUF, the third column the signal strength in dB relative to 1 uV (dBU) at the MUF. The fourth column lists the "frequency of optimum travail" (FOT), or the optimum working frequency.

The signal strengths are all shown in dB relative to a reference of 1 uV in 50 Ohms at the receiver antenna input. The table below relates these figures to the amateur S-point 'standard' where S9 is 50 uV at the receiver's input and the S-meter scale is 6 dB/S-point.

uV in 50 Ohms	S-points	dB (uV)
50.00	S9	34
25.00	S8	28
12.50	S7	22
6.25	S6	16
3.12	S5	10
1.56	S4	4
0.78	S3	-2
0.39	S2	-8
0.2	S1	-14

The tables are generated by the Graph-DX program, assuming 100 W transmit power output, modest beam antennas (e.g. three-element Yagi or cubical quad) and a short-term forecast of the sunspot number. Actual solar and geomagnetic activity will affect results observed.

The three regions cover stations within the following areas:

VK EAST. The major part of NSW and Queensland.

VK SOUTH. Southern-NSW, VK3, VK5 and VK7.

VK WEST. The south-west of West Australia.

GraphDX is written in the C language and runs on any IBM PC AT/XT or compatible computer with Hercules, CGA or VGA adapter and screen. Enquires to FT Promotions, PO Box 285, Balmain NSW 2041. ar

VK EAST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	16.8	3	12.8	-2	4	3	-2	-11
2	16.8	-2	12.7	-10	0	0	-3	-11
3	21.1	1	15.9	-21	-4	1	1	-2
4	27.5	4	21.1	-33	-9	0	4	4
5	32.4	5	25.3	...	-12	-2	4	6
6	32.4	5	26.5	...	-13	-2	4	6
7	31.8	5	25.8	-39	-12	-1	4	6
8	30.5	5	24.5	-33	-8	1	5	8
9	29.0	7	24.4	-22	-2	5	8	7
10	27.1	9	21.6	-9	5	9	10	7
11	25.5	11	20.2	1	11	13	11	7
12	23.8	13	18.9	12	17	16	12	6
13	22.5	17	17.8	23	23	19	13	5
14	21.3	21	16.9	31	26	21	12	2
15	19.9	23	15.9	35	27	20	10	-1
16	18.5	25	14.5	35	26	17	5	-8
17	17.5	26	13.6	35	24	15	2	-13
18	15.9	28	12.3	33	21	9	-5	-22
19	14.2	29	11.0	29	15	2	-15	-35
20	15.1	28	11.5	31	18	6	-10	-28
21	19.7	24	15.5	37	28	20	9	-2
22	21.1	23	16.3	32	28	23	14	5
23	18.9	18	14.5	19	18	14	7	-3
24	19.5	12	15.0	9	13	11	5	-3

VK STH - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	17.3	9	13.3	5	9	6	-1	-11
2	17.1	2	13.0	-4	3	2	-3	-11
3	21.5	3	17.0	-16	-1	3	2	-1
4	28.3	5	21.8	-29	-6	1	5	5
5	31.6	5	26.0	-37	-10	0	4	6
6	31.3	4	25.9	-39	-12	-2	3	5
7	30.9	4	25.2	-39	-12	-2	3	4
8	29.9	4	24.1	-35	-10	0	4	4
9	28.1	5	22.5	-26	-5	2	5	5
10	26.2	6	20.7	-15	1	6	7	4
11	23.4	7	18.5	-5	6	8	6	1
12	21.1	10	16.6	6	11	10	5	-2
13	18.9	14	14.9	16	15	10	2	-8
14	17.2	19	13.6	23	17	9	-2	-16
15	16.0	23	12.7	27	17	7	-7	-24
16	15.3	25	12.0	28	16	4	-12	-30
17	14.5	26	11.3	27	14	1	-17	-37
18	14.1	28	10.9	27	12	-1	-20	...
19	13.3	29	10.2	25	9	-6	-27	...
20	12.6	29	9.6	23	6	-10	-33	...
21	13.9	28	10.5	27	12	-2	-22	...
22	17.7	24	13.3	32	23	13	0	-14
23	18.2	21	14.0	26	21	15	5	-7
24	20.6	16	15.9	19	19	16	9	0

VK WEST - MEDITERRANEAN

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.8	14	12.1	15	11	3	-8	-23
2	15.7	7	11.9	6	6	1	-9	-21
3	19.6	5	15.5	-4	4	5	0	-6
4	25.7	6	19.7	-15	1	6	6	4
5	29.9	5	22.7	-24	-3	4	7	6
6	29.6	5	24.7	-28	-5	2	5	5
7	29.4	4	23.8	-29	-6	1	5	5
8	29.1	4	23.8	-28	-6	2	5	5
9	28.4	5	23.0	-24	-4	3	5	4
10	27.0	5	21.7	-17	0	5	6	4
11	25.5	7	21.5	-7	6	9	8	4
12	23.4	10	18.6	5	12	12	8	2
13	21.7	14	17.2	16	18	14	8	0
14	20.0	17	15.8	25	21	15	5	-6
15	18.7	21	14.8	31	23	14	2	-11
16	17.6	23	13.9	31	21	11	-2	-17
17	16.6	24	13.2	31	19	8	-7	-24
18	15.6	26	12.2	30	17	4	-13	-32
19	15.0	26	11.7	29	15	1	-17	-37
20	13.8	27	10.7	26	10	-5	-26	...
21	12.6	28	9.7	22	3	-13	-37	...
22	13.6	27	10.4	25	9	-7	-28	...
23	17.6	24	13.9	34	23	12	-2	-17
24	17.4	22	13.5	28	21	13	1	-12

VK EAST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	15.6	5	10.4	1	4	2	-5	-15
2	15.2	6	10.3	5	6	2	-6	-17
3	14.5	9	10.0	9	7	1	-8	-21
4	13.7	13	9.5	13	8	0	-13	-28
5	13.7	17	9.7	16	9	0	-14	-30
6	14.4	21	10.3	21	13	3	-10	-26
7	17.4	22	12.7	27	20	13	2	-10
8	21.4	19	15.6	26	23	19	12	3
9	17.9	16	13.7	16	15	12	4	-4
10	17.1	9	13.0	5	9	7	1	-7
11	16.8	1	13.2	-4	3	2	-3	-11
12	15.6	-6	12.3	-11	-1	-1	-5	-13
13	14.7	-12	11.6	-15	-4	-3	-6	-13
14	13.9	-18	10.9	-17	-5	-3	-7	-13
15	13.4	-22	10.4	-18	-5	-4	-7	-13
16	12.6	-37	9.7	-25	-12	-10	-13	-21
17	12.0	...	9.1	-31	-17	-15	-20	-28
18	13.2	-28	10.0	-22	-8	-6	-9	-15
19	16.8	-12	13.2	-25	-8	-4	-4	-8
20	21.9	-2	16.2	-30	-10	-3	-1	-2
21	21.2	-1	14.4	-25	-6	-1	0	-2
22	19.1	-1	12.9	-16	-2	0	0	-5
23	17.7	0	11.9	-9	1	2	-1	-8
24	16.7	2	11.2	-3	3	2	-2	-10

VK STH - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.7	0	10.1	-1	2	-1	-9	-19
2	14.2	3	9.9	3	3	-1	-11	-24
3	13.6	7	9.5	7	4	-3	-15	-30
4	12.8	11	9.1	11	4	-6	-21	-38
5	12.8	15	9.3	14	5	-6	-22	...
6	13.5	19	9.9	18	8	-3	-19	-37
7	16.0	21	11.9	24	16	7	-5	-20
8	19.4	20	14.4	27	22	16	7	-4
9	19.7	16	13.7	21	18	14	5	-4
10	17.7	12	12.2	12	12	7	-1	-11
11	15.8	5	10.9	3	5	1	-6	-17
12	14.8	-2	10.1	-3	1	-1	-9	-19
13	13.9	-9	9.7	-8	-2	-3	-9	-19
14	13.1	-16	9.1	-11	-3	-4	-9	-18
15	12.5	-28	8.8	-18	-8	-8	-13	-22
16	11.8	...	8.4	-32	-20	-19	-25	-36
17	11.5	...	8.3	...	-26	-26	-32	...
18	12.7	...	9.2	-34	-19	-17	-21	-29
19	15.4	-17	10.6	-24	-8	-4	-5	-10
20	19.7	-7	14.6	-32	-11	-5	-3	-5
21	20.2	-6	14.1	-31	-11	-4	-2	-5
22	18.2	-6	12.6	-23	-7	-3	-3	-7
23	16.8	-5	11.6	-15	-3	-1	-4	-10
24	15.8	-3	10.9	-8	0	0	-5	-14

VK WEST - EUROPE L.P.

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.2	-11	9.9	-11	-4	-5	-11	-19
2	13.7	-8	9.6	-6	-2	-5	-13	-23
3	13.1	-5	9.3	-2	-1	-6	-16	-28
4	12.3	-2	8.9	0	-2	-8	-20	-35
5	12.4	2	9.0	4	0	-9	-22	-38
6	13.1	6	9.6	6	1	-6	-20	-35
7	15.4	11	11.5	11	7	1	-10	-23
8	18.5	13	13.8	15	13	8	0	-10
9	21.4	13	16.0	16	16	13	7	-1
10	21.8	11	14.9	13	15	12	6	-1
11	19.4	7	13.2	5	8	6	0	-7
12	17.4	1	11.8	-4	1	0	-4	-12
13	15.6	-6	10.5	-10	-2	-3	-8	-16
14	14.6	-13	9.8	-15	-5	-5	-9	-17
15	13.8	-20	9.4	-17	-7	-6	-10	-17
16	13.0	-32	8.8	-24	-12	-10	-14	-21
17	12.4	...	8.5	-35	-21	-19	-23	-31
18	11.6	...	8.1	...	-28	-27	-32	...
19	11.3	...	8.0	...	-31	-29	-35	...
20	12.5	...	9.0	-34	-20	-18	-22	-30
21	15.3	-19	10.2	-25	-10	-6	-8	-13
22	17.6	-12	12.4	-28	-11	-6	-6	-10
23	16.4	-13	11.4	-23	-9	-6	-7	-12
24	15.3	-12	10.7	-17	-6	-5	-8	-15

APOGEE ARTS

REPEATERS - ADDITIONS, DELETIONS, ALTERATIONS. HAVE YOU ADVISED THE WIA OF CHANGES NEEDED TO THE REPEATER LIST?

VK EAST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.9	8	10.9	7	6	0	-11	-25
2	14.1	2	10.8	2	3	-1	-10	-23
3	14.5	-2	11.1	-3	1	-1	-9	-20
4	19.1	2	14.5	-9	1	3	0	-6
5	25.9	5	20.0	-18	-1	4	5	3
6	28.5	4	21.0	-21	-2	4	6	4
7	27.6	4	20.9	-20	-2	4	5	4
8	26.0	5	20.6	-16	0	4	5	2
9	24.3	6	19.2	-9	3	6	5	1
10	21.7	7	17.1	-2	6	7	4	-2
11	19.5	8	15.4	3	8	7	1	-7
12	17.5	10	13.8	9	10	6	-2	-13
13	15.9	13	12.5	14	11	4	-7	-20
14	14.8	18	11.7	19	12	2	-11	-28
15	14.1	25	11.1	24	13	1	-16	-35
16	13.3	27	10.4	25	11	-2	-21	...
17	12.9	29	10.0	25	9	-5	-25	...
18	12.1	31	9.3	23	6	-10	-32	...
19	11.6	31	8.8	22	3	-13	-37	...
20	12.7	30	8.6	25	8	-7	-28	...
21	12.1	29	8.4	22	5	-11	-33	...
22	11.4	23	8.0	16	0	-15	-37	...
23	11.1	14	7.9	10	-1	-16	-36	...
24	12.2	9	8.8	9	1	-9	-25	...

VK STH - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	14.6	14	10.7	14	9	2	-10	-25
2	15.3	10	11.6	9	8	2	-7	-20
3	20.1	10	15.9	6	11	9	4	-3
4	27.2	9	20.3	-1	10	12	11	7
5	29.2	7	21.6	-9	5	9	10	8
6	29.8	6	21.7	-13	3	8	9	7
7	29.7	6	21.4	-14	2	7	9	7
8	28.7	6	20.5	-12	3	8	9	6
9	27.1	7	19.1	-6	6	9	9	5
10	25.3	8	17.7	0	9	11	9	4
11	22.6	9	15.8	5	11	11	6	0
12	19.9	11	13.8	9	12	9	2	-6
13	17.9	13	12.4	15	13	8	-1	-13
14	15.9	17	11.0	20	13	4	-8	-24
15	14.9	23	10.2	25	14	2	-14	-32
16	14.0	26	9.6	25	12	-1	-19	...
17	13.2	28	9.2	25	9	-5	-25	...
18	12.5	29	8.8	23	6	-10	-32	...
19	11.8	30	8.4	21	2	-15	-39	...
20	11.7	30	8.4	21	2	-15	...	...
21	12.8	30	9.0	25	8	-7	-28	...
22	12.1	28	8.5	21	4	-12	-34	...
23	11.8	22	8.5	16	1	-13	-34	...
24	13.0	16	9.5	15	5	-6	-23	...

VK WEST - AFRICA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	13.5	19	10.2	18	8	-3	-20	-39
2	14.8	14	11.3	15	10	2	-10	-25
3	19.5	12	15.4	11	13	10	4	-5
4	26.4	11	20.4	4	13	14	12	8
5	29.7	7	22.3	-5	8	12	12	9
6	29.4	7	24.7	-9	5	9	10	8
7	29.2	6	24.2	-11	4	8	9	7
8	28.8	6	23.5	-11	4	8	9	6
9	27.8	6	22.5	-9	5	9	9	6
10	26.2	7	20.9	-4	7	10	8	4
11	24.4	9	20.7	3	11	11	8	3
12	21.8	11	17.2	11	14	12	6	-1
13	19.6	14	15.5	17	16	11	3	-7
14	17.6	19	13.9	23	18	10	-2	-15
15	16.0	24	12.6	28	18	7	-8	-25
16	14.9	26	11.6	28	16	3	-14	-33
17	14.2	28	11.2	28	14	0	-18	-39
18	13.4	29	10.5	27	11	-3	-24	...
19	13.0	30	10.1	26	9	-6	-27	...
20	12.2	31	9.4	23	6	-11	-34	...
21	11.7	32	8.9	22	3	-15	-39	...
22	12.9	30	9.8	26	9	-7	-28	...
23	13.1	30	10.1	26	11	-4	-25	...
24	12.3	26	9.4	20	5	-9	-30	...

VK EAST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	34.8	23	29.4	28	33	34	33	30
2	34.3	23	28.7	28	34	34	33	30
3	34.2	23	28.3	30	35	35	33	30
4	33.9	24	27.7	33	36	36	34	31
5	33.1	25	26.8	37	39	38	35	31
6	31.8	27	25.5	44	43	41	37	32
7	30.2	29	24.0	50	46	42	37	31
8	28.3	30	22.4	51	46	42	36	29
9	26.5	31	21.0	51	46	41	34	27
10	24.7	32	19.6	51	45	39	32	23
11	23.3	34	18.4	51	44	38	30	20
12	21.9	35	17.3	50	42	36	27	17
13	20.2	36	16.0	49	41	33	23	12
14	18.7	37	14.7	47	38	30	19	6
15	17.6	38	13.7	46	37	27	15	2
16	16.0	39	12.4	44	33	22	8	-5
17	14.3	41	11.0	41	28	16	1	-15
18	15.1	40	11.5	43	30	19	5	-10
19	19.8	34	15.0	44	37	30	21	10
20	26.6	28	20.5	39	39	36	31	24
21	32.0	25	25.1	35	37	36	34	30
22	34.7	24	27.7	32	36	36	34	31
23	35.0	23	28.5	29	34	35	34	31
24	35.1	23	29.1	28	34	35	33	30

VK STH - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	26.6	13	22.1	17	21	20	16	9
2	26.2	13	22.2	17	21	20	15	8
3	25.9	13	21.7	19	22	20	15	8
4	25.7	14	21.3	22	24	21	15	8
5	25.3	15	20.7	26	26	23	16	8
6	24.5	18	19.6	34	30	25	17	7
7	23.0	21	18.2	40	33	26	15	4
8	20.8	23	16.5	40	31	22	9	-4
9	19.2	25	15.2	39	28	17	3	-12
10	17.4	26	13.8	37	24	11	-5	-23
11	15.7	28	12.4	33	18	3	-16	-38
12	14.3	29	11.3	30	12	-4	-27	...
13	13.3	30	10.5	26	7	-11	-36	...
14	12.7	31	10.0	24	3	-16	...	...
15	12.0	32	9.4	21	-1	-22	...	...
16	11.6	32	9.0	19	-4	-26	...	...
17	10.9	33	8.4	16	-10	-34	...	...
18	10.4	34	7.9	12	-15	...	...	...
19	11.4	26	8.6	15	-6	-27	...	...
20	14.4	19	10.8	20	8	-4	-23	...
21	18.8	16	14.4	21	17	10	-1	-15
22	22.7	14	17.7	20	20	17	9	0
23	25.3	13	20.1	18	21	19	14	6
24	26.3	13	21.4	17	21	20	15	8

VK WEST - ASIA

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	32.1	9	26.0	2	14	17	16	14
2	32.4	9	26.8	2	13	17	17	14
3	31.8	9	23.9	3	14	17	16	14
4	31.4	10	26.3	5	16	18	17	14
5	31.1	11	25.7	10	19	20	18	14
6	30.5	13	24.7	19	24	24	21	16
7	28.8	15	23.0	28	29	27	22	16
8	26.9	18	21.3	35	33	28	22	14
9	24.1	21	19.1	40	34	28	19	9
10	22.0	23	17.4	40	32	25	15	4
11	19.8	25	15.7	39	30	21	9	-3
12	18.3	27	14.4	38	27	18	4	-10
13	17.0	28	13.5	36	25	14	-1	-17
14	16.0	29	12.6	34	22	10	-6	-24
15	15.2	30	12.0	33	19	6	-11	-30
16	14.4	31	11.3	31	17	3	-15	-36
17	13.9	31	10.7	30	15	1	-18	-39
18	13.0	33	9.9	28	12	-3	-24	...
19	12.5	28	9.6	23	7	-7	-29	...
20	13.8	20	10.5	20	10	-1	-18	-38
21	17.6	16	13.9	19	16	9	-1	-14
22	23.1	13	17.7	15	18	16	10	3
23	27.8	11	21.7	8	16	17	15	10
24	31.0	10	24.6	4	15	17	16	13

VK EAST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	30.1	7	25.4	-25	-3	4	8	8
2	28.2	8	22.3	-13	3	8	10	8
3	25.8	10	20.5	-1	9	12	11	7
4	24.1	14	19.1	11	17	16	13	7
5	23.1	17	18.3	22	23	20	14	7
6	22.4	21	17.7	32	28	23	15	6
7	21.2	23	16.8	36	30	23	14	3
8	20.3	24	15.9	37	29	22	12	0
9	18.9	26	14.7	37	28	19	8	-4
10	17.2	27	13.3	35	25	15	2	-13
11	15.9	28	12.2	33	21	10	-4	-21
12	16.2	28	12.4	34	22	12	-2	-19
13	20.0	25	15.8	38	30	22	11	0
14	19.1	22	14.8	30	24	17	6	-5
15	17.5	18	13.5	21	17	11	1	-10
16	16.1	10	12.5	9	9	4	-5	-18
17	14.2	1	10.9	1	2	-2	-12	-25
18	14.9	-4	11.4	-6	0	-2	-9	-20
19	19.5	0	14.8	-16	-2	0	-1	-6
20	26.2	3	20.2	-28	-7	0	3	2
21	31.3	5	24.6	-37	-11	-1	4	5
22	31.1	5	23.8	...	-12	-2	4	6
23	31.2	6	26.0	-39	-12	-1	4	6
24	31.7	6	25.5	-35	-9	0	6	7

VK STH - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	32.1	8	24.4	-25	-3	5	9	9
2	30.2	10	24.0	-13	4	10	12	11
3	28.0	12	22.2	0	12	15	14	11
4	26.4	15	20.9	12	19	19	16	12
5	25.5	18	20.2	24	25	23	19	12
6	24.8	20	19.6	33	31	27	20	13
7	23.5	23	18.7	38	33	27	20	11
8	22.3	24	17.5	39	33	26	17	8
9	20.5	25	16.0	39	31	24	13	2
10	18.5	27	14.4	37	28	19	7	-5
11	16.6	28	12.8	35	24	14	0	-15
12	16.5	27	12.9	33	21	10	-4	-21
13	15.7	27	12.4	31	19	7	-8	-26
14	14.8	22	11.6	23	13	2	-13	-31
15	14.4	15	11.1	15	9	0	-14	-31
16	13.5	5	10.4	6	3	-4	-17	-32
17	12.7	-4	9.7	0	0	-6	-18	-32
18	14.0	-6	10.6	-6	-1	-4	-11	-23
19	18.1	-2	14.2	-14	-2	0	-3	-9
20	23.8	2	18.1	-26	-6	0	2	0
21	28.8	3	22.4	-36	-10	-1	3	3
22	32.0	4	25.5	...	-12	-2	4	5
23	33.1	5	26.9	...	-12	-1	4	6
24	33.4	6	27.1	-35	-9	0	6	7

VK WEST - STH PACIFIC

UTC	MUF	dBU	FOT	14.2	18.1	21.2	24.9	28.5
1	29.9	6	25.2	-38	-11	0	5	7
2	27.9	7	22.1	-28	-5	3	7	7
3	25.4	8	20.1	-18	0	6	8	6
4	23.6	10	18.7	-6	7	10	9	6
5	22.4	13	17.8	4	13	14	11	5
6	21.7	16	17.1	14	18	17	12	5
7	20.5	21	16.3	25	23	19	12	3
8	19.7	24	15.4	32	27	21	12	1
9	18.5	27	14.4	35	28	20	9	-3
10	16.9	29	13.1	35	26	16	4	-10
11	15.8	30	12.2	35	24	13	-1	-17
12	16.3	30	12.4	36	25	15	1	-14
13	17.4	28	13.7	36	26	16	3	-11
14	16.3	25	12.8	29	20	11	-2	-17
15	15.5	19	12.3	21	15	7	-5	-19
16	14.8	13	11.6	13	10	3	-8	-21
17	14.5	5	11.3	4	6	1	-8	-20
18	13.6	-3	10.5	-2	2	-1	-9	-21
19	12.8	-12	9.8	-6	0	-2	-10	-21
20	14.1	-12	10.7	-11	-2	-1	-6	-15
21	18.3	-5	14.4	-23	-5	-1	-1	-5
22	24.1	1	18.5	-35	-11	-2	1	1
23	29.0	4	22.7	...	-15	-4	2	4
24	31.6	5	25.4	...	-15	-3	3	6

VK EAST - USA/CARIBBEAN

VK STH - USA/CARIBBEAN

VK WEST - USA/CARIBBEAN

APOGEE ARTS

HAMADS

TRADE ADS

● ELECTRONICS TECHNICIAN. Part and full-time positions available in a modern and well-equipped workshop in North Ryde. Suit technicians with a solid analogue background. Contact Martin Griffith SWITCHMODE POWER SUPPLIES Pty Ltd, 3 Avon Road, North Ryde. (02) 888 9371.

● LOGMASTER Radio logkeeping software, $89. CODEMASTER Morse training/proficiency software $49, endorsed by Officers of Signals Schools of Aust Army. Both products include manuals for IBM/clones PC, XT, AT. Information/order; Milestone Technologies P/L, PO Box 699, Mt Waverley, Victoria, Australia 3149. Tel: (03) 807 6767. 8 Greenham Cres, Mt Waverley 3149.

● AMIDON FERROMAGNETIC CORES: For LF/HF/VHF/UHF applications. Send DL size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office, please ... 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscott Electronics, Melbourne.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution short-wave weatherfax, morse & RTTY receiving program. Needs CGA, SSBhf radio & Radfax decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2, but suitable for Hercules, EGA and VGA cards respectively, $35. SATFAX is a NOAA, Meteor and GMS weather satellite picture receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, and Weatherfax PC card, + 137MHz receiver, $45. All programs are on 5.25" or 3.5" disks (state which) + documentation. Add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Qld 4005. Ph: (07) 358 2785.

FOR SALE - NSW

● C45 10m FM 25w xcvr complete, EC, $150. Oscilloscopes Telequipment D43R DB25MHz, $300. AN/USM24C 10MHz, $100. Telequipment p.l. units from $50. Signal Generators BC221AH AC PSU, $70. Marconi TF144H Ser II, $130. All ONO. Brian VK2KLH QTHR (02) 545 2850.

● HALLICRAFTER Communications Receiver SX100 Mark 2, good working cond, complete with manual. Also Eddystone Model 750 ditto genuine original vintage gear. What offers SNS 30135005 & G12423 Ian VK2CJP QTHR (02) 44 4985.

● 2M LINEAR AMPLIFIER Daiwa LA2065. Ga As preamp 50w output. EC. $185. John VK2KOK QTHR (02) 918 2911.

● TOWER 40' WINCH UP two sections, needs guys, plus bearing and plates. Steve VK2ASG AH (043) 24 1542, BH (02) 565 9730.

● AVO MODEL EIGHT Mark Five meter. Probes and accessories, including top grain hide carry case. Mint condition. Ser Num 81306. Best offer. Contact Martin Griffith (02) 868 1089 (AH), (02) 888 9371 (BH).

● HB HF LINEAR full legal power $120. Thomson 250A amber monitor, working, $45. Telequipment D43 double trace scope, good order, with full manual, $250. Toshiba T-100 computer. All software, colour monitor, $250. VK2WS QTHR (067) 75 2158.

● ICOM IC2GAT HANDIE as new, case, speaker mic, $500 ono. Swan 350C XC230 PSU new finals and driver, goes well, offers. New 4XC250B, 4CX250R, 4CX125C, 4CX350A 4X150. Robert VK2BBR QTHR (068) 21 2832 (BH), 068) 24 3445 (AH).

● YAESU FT-780R 70cm txvr (all mode) $400. Dave VK2KFU (02) 489 1810 after 7pm.

FOR SALE - VIC

● STANDARD C150E 2m h/held compl with ext mic/spk case extra ant access as new, $350. Tower 60' 2 sec self-supporting, $400. Rob VK3JE (060) 37 1262.

● ICOM 725 Transceiver with 500Hz CW filter fitted, as new in original packing, $1200. Icom R71A general coverage receiver, EC, original packing, $1300. Kenwood PS50 power supply, $300. Mirage MP1 SWR PWR meter, $150. ENB2 noise bridge, $50. EAT300 antenna tuner, $50. Peter VK3MEA QTHR (03) 428 2294.

● COLLECTOR ITEM. National HRO receiver, circa 1938 4B/S G/C coil boxes. Good, complete cond, but no power supply, $125 ono. Ron VK3OM QTHR (059) 44 3019.

● LARGE AWA TRANSMITTING VARIABLE CAPACITORS 190pF (2 ea), 300pF (3 ea), $20 ea. OBO. Also Roller Inductor, 0 to 24uHy with turns counting dial, $30. Drew Diamond VK3XU QTHR (03) 722 1620 evenings.

● SHACK CLEARANCE: Makita hammer drill, 800w 2sp 19mm chuck (brand new, still in box, never used), $240. 2-in-1 power supply +12v 5amp, +31v 3amp, $100. 2 +12vΔ -12v DC 312mA AC adaptors, $20 ea. 1 6v 100mA AC adaptor, $15. 1 Sendata 300 modem: 300BPS IBM PC or compatible, $120. 1 Pasom modem isolator: IBM PC or compatible, $130. 12 2v 200 AH lead acid cells, $20 ea or 6 for $100. 8 6v 90 AH lead acid cells, $30 ea or 2 for $50.. 2 12V 50 AH gel cells (brand new), $120 ea. Great power supplies! Evan VK3EJV (03) 438 2878.

● YAESU FT707 HF xcvr with mic & mobile mount, VGC, $625. Dentron American ATU 160/10m. 300W bal or unbal output, $125. Hidaka 10/15m 3EL beam with balun, $125. Chimside 80/10m trap vert EC, $100. Kenwood 7200 2m FM. 7ch fitted inc RTTY. $135. Ron VK3OM QTHR (059) 44 3019.

● FRG7 WITH Digital Readout fine tune CW filter wideband filter supplied, workshop manual, serial no 120097, $220. Bob (03) 541 5458 BH.

● ARGONAUT QRP txvr, very good, $350. Linear Heath USA two Cetron 572Bs with PS switched to 2kv with meter, $750. Audio Generator 300 cps to 50 kc Advance, $50. Frequency meter BC221 230v, exc, $50. Voltohmst AWA, $40. TV camera Philips video and RF output with Schneider 1.4 lens, $200. Vibrators. Old dial glasses and telephones. Enquire. Air compressor mobile, $200. Drill press, $80. VK3DS QTHR (053) 32 3226.

● OFFERS invited for YAESU FT757GX11, FP757HD with speaker and MD-1 mic. This rig has worked 267 countries this year. Immaculate, as-new cond, Aug 31 closing date for offers, Roth VK3BG (03) 725 3550.

● RACKS with doors 6ft high (2 off), $30 ea. VK3AGW Arnold, Belgrave. (03) 754 4111 AH.

● EIGHT-ELEMENT Log Period beam ATN, VGC, complete with balun. Also scanner SC7000 SE1CO with antenna also UHF handheld CB. (051) 99 2811 BH or 018 513 108 AH.

● ICOM IC751 HF txvr with mike, manual, original carton, $1700. Yaesu FT290R all mode VHF PC shack use only with Nicads speaker mike and bracket, $510. CB txvr Cobra 148GTL with mike, hardly used, $210. Comm rcvr Sony ICF2001 with power supply PC, $250. Icom IC-02N HH 140-152MHz speaker mike, $340. Yaesu scanner FRG9600 with manual & workshop manual, original carton, PC, $770. Yagi 5el beam tribander, $450. Yagi 6el beam duobander 10-15m, $180. Yagi 3el 10-11 beam new, $115. ATU roller coil tuner, 2kW $200. VHF 2M linear input 300mW O/P 40 watts, $105. Monitor Scope YO-100 PC, as new, $320. BWD, CRO dual tracer 35MHz, $650. Home brewer HF linear 1kW pep 2XQB3/300 and 2 spares, $900. All antennae Werner Wulf VK3AXJ QTHR.

FOR SALE - QLD

● BIRD 43 POWER METER, $500. Philips power meter & dummy load (reversible) for 477MHz band, $300. VK4DY QTHR.

● OLD VALVES - radio TV - transmitting - some test equipment. Send for list or send your list (SAE). Old valve radio circuits (copies) available. VK4DY QTHR.

● FILTER CAPS 450 volt 2000UF, $10 EA. 6 VOLT 110 AMP HR gel-cells, $30 ea or $55 pair. PSK Packet Modem fits PK232, $130. UHF cavities 70dB isolation at 5MHz, $130 ea. Mick VK4BMT (074) 98 2176.

● G4ENA FAST SCAN to slow scan converter, needs completing, all parts & constructional details supplied, $150. RF Generator Heathkit, $35. video Camera monochrome Nolens, $40. TV mast top amp VHF/UHF, $35. Audio Generator Heathkit, $50. FET tester, $25. Sony V Ideo recorder Beta (needs new heads), $50. TV tcvr 70cm, $100. Inverter 12V DC to 270V DC, eq-equipment, $10. P & P extra. All items. VK4ZFQ (077) 79 4641. NOT QTHR.

● YAESU FT747 fine cond, $950. Yaesu FC757AT, never used, brand new, 18 mths MFT own guarantee, $600. All with manuals. Steve VK4DDB from 7pm to 8pm (07) 261 1711.

FOR SALE - SA

● POWER SUPPLY ideal super linear or B/C station Genelec transformer WE filter complete two HI PR chokes, rectifiers, filament transformer, unassembled, $150. Complete new price transformers, $600. VK5OC QTHR (08) 31 4194.

● TWO KENWOOD TH-215A-2M-VHF-FM handhelds, s/nos 909434 9090424 c/with Ken PB1 and BC8 battery packs & chargers, all brand new, $450 ea complete set. VK5NCB (085) 52 2340.

● YAESU FT726R VHF/UHF allmode base, 2m only fitted, s/n 220208, as new, with mic, manual and technical manual, $900. Phil VK5AKK (08) 381 5427.

● EICO HF txvr 80/40/20 200 watts base or mobile, has manuals and spare finals, slight relay fault on vox. Comes complete with power supply. A cheap first rig. Contact Doc c/- VK5BWR (086) 45 4168.

FOR SALE - TAS

● YAESU FT2700RH 25W FM 2m/70cm txvr with voice synthesizer option. As new cond, little use, $800 or swap for Yaesu FT690 Mk 2. Damien VK7CDI (003) 95 4153 AH.

● PRESIDENT HR-2510 txvr, mint cond, 5 mths old, unmod original packing, ser no 95000653, $300. Clarrie VK7HC (004) 31 8211. Licensed amateurs only.

WANTED - ACT

● HF TRANSCEIVER 100W SS, prefer less complex unit for extended portable operation. Mike VK1VW (06) 274 6640 BH, (06) 254 4784 AH.

WANTED - NSW

I ARC-5 COMMAND gear, especially BC RX coil set, cable connectors, splined tuning cables and mountings. TRC75 modules, especially SG179A-URC oscillator. PRC77 add-ons, especially OA3633 amplifier & mounting. Brian VK2KLH QTHR (02) 545 2650.

● MICROLOG AIR-1 RTTY & AMTOR cartridge for Commodore 84. Norbert (049) 61 1247.

● CIRCUIT DIAGRAM or manual for Cossor Model 339 oscilloscope copying costs paid. Nick VK2AOH QTHR (063) 62 5229.

● TUNING CRANK for Command Receiver, also CW filter for FT101E. VK2DHK Doug QTHR (063) 31 7775.

● MACHINE to HAND WIND honeycomb and PI wound coils, Horrie VK2LY QTHR (02) 858 4950.

● TECHNICAL manual AN/ARC49 or AN/ARC3, also ARC49 transmitter, control and junction boxes, and connecting cables. All costs refunded. Peter VK2CPK QTHR (02) 411 1227.

WANTED - VIC

● VALVES: 12v hybrids, types 12AD6, 12AE6, 12BL6, 12FK6, 12K5, 12F8, 12U7. Battery series, types 1T4, 1R5, 1S5, 1U5, 3S4, 3V4. Bruce VK3YBW QTHR (03) 527 2661 after 6pm.

● VERTICAL ANTENNA four band 15-80m Chirnside CE-5SS or similar. John Fullagar VK3AVY QTHR (03) 758 2358.

WANTED - QLD

● MANUAL OR CIRCUIT of solid state modules SSM Europa-B transverter. Also Racal RA-121B independent sideband adapter operating handbook circuit AWA Voltohmyst 1A56074, any info on linear type unknown has EEC on circuit boards. John VK4DJS QTHR (070) 91 2705.

● FLASHING SIGNAL LAMP bulbs (sealed multi-filament) for Grimes US Aircorps type C3A signalling lamp, approx 150mm diam type GE/MAZDA 4521 26v 5.3A or 13v 6.6A par 46. Restoring 2 RAAF ATS/AR8 wireless sets, require parts lists and alignment details or copy of handbook, also 12v or 24v generators VK4EF ex WWII Signaller, 97 Jubilee Tce, Bardon, 4065. (07) 366 1803.

● CIRCUIT AR88LF receiver, all costs paid. VK4CF QTHR (07) 355 3969.

WANTED - SA

● MANUAL FOR TRIO comm rcvr, model JR60, pay $10. VK5BO QTHR (08) 47 5696.

WANTED - TAS

● ICOM IC-02A handheld 144MHz, FM transceiver, going or not. I specifically require keyboard and LCD display for the above. (002) 49 3988 after 4pm daily.

Stolen Equipment

Stolen from VK2IT David Woollett, 12 Broadarrow Rd, Beverly Hills on the night of 7/8 August 1991. Swan MB40 serial no 16471. Yaesu Musen transceiver FT101B serial no 320376, and desk microphone. Yaesu Musen receiver FRG7, serial no 8HH210862. ICOM IC 560 6m transceiver, serial no 02057 with microphone. ICOM IC211 2m transceiver, serial no not known, with microphone. Philips FM321 70cm transceiver (FM), serial no 156, with microphone.Digital frequency counter, Goodwill Instrument Co type, GFC-8055FF, serial no 2020452. Contact Joyce Woollett, (02) 764 2855 (work).

Stolen on the evening/early morning of 15/16 July 1991 between 10pm and 1am, a YAESU FT4700RH Duobander, s/n 9C 212240 from a car in East St Kilda. It is missing a microphone and power lead. It has no identifying markings. Contact Michael Weinstock VK3EMJ, 9 Los Angeles Court, Ripponlea 3183. Phone (03) 531 9954 home; parents' work (03) 363 1026.

A Yaesu FT-212RH 2m transceiver, serial number IC630020, was stolen from a car in the Penrith area, about two weeks ago. If this equipment is seen, please contact the Penrith Police Station, or Mitch VK2XMM on telephone (02) 623 4787, or the various Sydney 2m repeaters.

Stolen from Brian Edwards VK3XBE on Sunday 28 July 1991 from his home at 24 Etnam St, West Preston. Phone (03) 484 2171. AEA PK-232 Pakratt multi-mode TNC S/N 19092; Aurex PC-X88AD black cassette deck; Daiwa 2m/70cm cross-needle SWR meter; Daiwa CNW-419 antenna tuner; Icom IC-271A 2m all-mode transceiver, S/N 27402603; Icom IC-471A 70cm all-mode transceiver, S/N 20801900; Icom IC-1271A S/N 001398; Icom IC-745 HF transceiver, never been on air; Icom IC-R70 communications receiver, S/N 18503539; Icom IC-R7000 communications receiver, S/N 002670; Icom IC-2M6 desk microphone, S/N 20507750; Icom IC-PS30 power supply, S/N 20302017; Microwave Modules 70cm 50W amplifier, model MML-432-50; Mirage 2m 150W and 60W amplifiers; Teac CD player; Tono terminal Theta-550, S/N 821485; Weller desoldering station; Weller soldering station; Yaesu FT-2084 2m FM HT; Yaesu YP-150 dummy load/power meter. If you have any details or reason to suspect that you have been approached by someone trying to sell some of this equipment, please immediately contact Senior Detectives Robyn Larkman or Glen Wilson at Preston CIB on (03) 479 6129.

Stolen from Keith Kennedy VK2PRK, 2/433 New Canterbury Road, Dulwich Hill 2209, YAESU transceiver FT7 ID NSW 718610 Kenwood. SMC/30 hand-held mike and speaker. Contact Marrickville police or owner (02) 569 6171 (home) or (02) 560 9999 (work).

Hamads

Please Note: if you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
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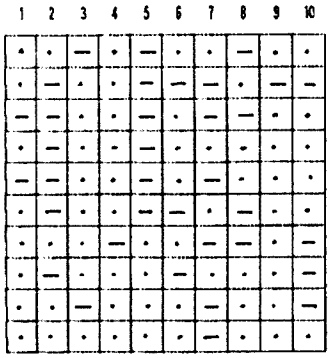
Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 54 P 45



Across: 1 earl; 2 enemy; 3 merge; 4 reds; 5 gale; 6 race; 7 steak; 8 last; 9 fix; 10 isle.

Down: 1 Innes; 2 atol; 3 bier; 4 hits; 5 Mons; 6 real; 7 wry; 8 cab; 9 leis; 10 lug.

TRADE PRACTICES ACT

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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Fill out the following form and send to:

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VK7	GPO Box 371D Hobart TAS 7001
VK8	C/o H G Andersson VK8HA
	Box 619 Humpty Doo NT 0836
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The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division

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Ant. Compendium Vol 2 Software only	BX293	$18.00
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Antenna Pattern Worksheets Pkt of 10 - ARRL	BX211	$5.40
Antennas 2nd ed John Kraus	BX259	$93.60
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All About VHF Amateur Radio - Orr	BX216	$15.60
Microwave Handbook Vol 1 - RSGB	BX318	$63.00
Microwave Update Con. 1987 - ARRL	BX174	$15.80
Microwave Update Con. 1988 - ARRL	BX183	$15.80
Microwave Update Con. 1989 - ARRL	BX321	$21.60
Mid Atlantic VHF Con. October 1987 - ARRL	BX175	$15.80
UHF Compendium Part 1 & 2 Vol 1	BX250	$67.50
UHF Compendium Part 3 & 4 Vol 2	BX251	$67.50
UHF Compendium Part 5 German Only	BX354	$67.50
UHF/Microwave Experimenters Manual - ARRL	BX325	$36.00
UHF/Microwave Experimenters Software 5 Inch Disk -	BX327	$18.00
VHF 21st Central States Con.,1987 - ARRL	BX172	$15.80
VHF 22nd Central States Con. 1988 - ARRL	BX173	$15.80
VHF 23rd Central States Con. 1989 - ARRL	BX286	$15.80
VHF 24th Central States Con. 1990 - ARRL	BX322	$21.60
VHF/UHF Manual - RSGB	BX267	$43.20
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge - Diamond		$4.00
WIA Badge - Diamond With Call Sign Space		$4.00
WIA Badge - Traditional Blue		$4.00
WIA Badge - Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Tape - Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book - 1991		$9.50
Band Plans Booklet		$2.80
WIA Log Book - Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all items above are available from all Divisions (and none are available from the Executive Office).
If the item is carried by your Divisional Bookshop, but is not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.

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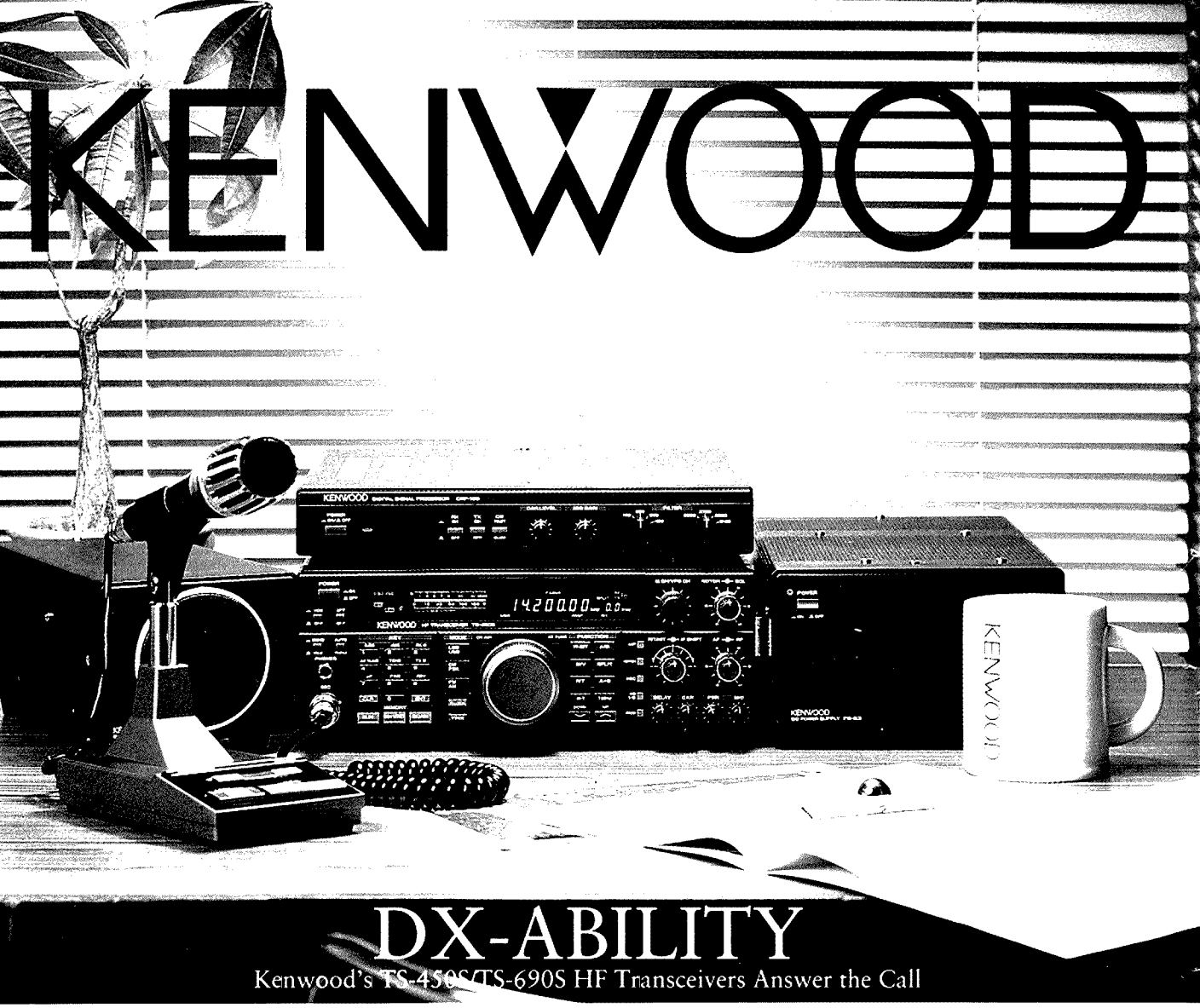

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
David Brownsey VK4AFA
Don Graham VK6HK
Evan Jarman VK3ANI
Peter O'Connor VK4KIP
Gil Sones VK3AUI
Phil Steen VK4APA
Roy Watkins VK6XV

DRAFTING
Vicki Griffin VK3BNK

MARKETING
Bruce Kendall VK3WL
Norm Eyres VK3ZEP

ADVERTISING
Brenda Edmonds VK3KT
June Fox

BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of Amateur Radio should be forwarded to: -
The Editor
Amateur Radio
PO Box 300
Caulfield South
VIC 3162

Registered Office
3/105 Hawthorn Road
Caulfield North VIC 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191
Business hours: 9.30am to 3pm weekdays

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The Yaesu FT-990 HF All Mode Transceiver. See review by Ron Fisher VK3OM on page 21

EDITOR'S COMMENT

Bill Rice VK3ABP Executive Editor

Practical Democracy

The meaning of "democracy" is clear from the two Greek words which it combines: "*demos*" - "people", and "*kratia*" - "authority" or "rule". But to allow the people to exercise their ruling power requires some kind of system, and here we have scope for many variations. Virtually all of the world's governments claim to be democratic, but the efficiency of their "people power" varies greatly. Perhaps we saw the most direct form in Red Square only a few weeks ago, with something like 100,000 people not only opposing the tanks, but eventually turning them back.

More commonly, the people nominate, or elect, or at least approve, someone to represent them in some kind of discussion or planning forum. Approval, either of the person or his or her actions, is presumed if there are few or no complaints. "No news is good news". But, if a number of people see fit to complain about their representatives, then perhaps the actions which produced the complaints are in need of review.

However, there is an important factor in this feedback process from people to representatives. This is that very little in politics is either simple or obvious. As life becomes more complex, the newly elected delegate will be faced with a bewildering mass of information, and be unable to make any useful contribution until the whole mass is absorbed and understood. And simply by virtue of its volume, even if not compounded by complexity and/or shrouded in secrecy, the information cannot be known in detail by the persons in the street. Most of them don't want to know, anyway!

This produces the practical result that an opposition party may claim philosophies quite different from those of the government. But, when the pendulum swings in its favour and it becomes the government, its policies may differ very little in practice. Actions are determined by the realities of the situation less than by who has to take the action.

The WIA displays in miniature all these features of democratic politics (except for parties). The members elect people to be their Divisional Councillors. Each Council elects one of its number to be Divisional President. The Councils nominate people to be their Federal Councillors (one per Division). The Federal Council nominates people to an Executive which carries on business between Council meetings. The Executive nominates, and the Council elects, one of their number to be Federal President.

All of these people have to develop policies and make decisions on behalf of the members, and often on behalf of all Australian radio amateurs. Sometimes these policies or decisions may be unpopular, but be assured they are based on a better knowledge of all the facts than the average member can possibly have. That may sound like "Father Knows Best"! If you feel strongly that you know better, you are welcome to put your views forward. Better still, why not volunteer for Council or Executive? There are vacant seats on Executive as well as some Councils, and many presently sitting would love to be able to retire!

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Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing the Australian Amateur Radio Service - Member of the International Amateur Radio Union

Registered Executive Office of the WIA: 3/105 Hawthorn Road, Caulfield North, Vic, 3161

All mail to: **PO Box 300, Caulfield South, Vic, 3162** Telephone: (03) 528 5962

Fax: (03) 523 8191

Business Hours: 9.30 am to 3.00 pm on Weekdays

General Manager and Secretary: Bill Roper VK3ARZ

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Who Do I Contact?

A question facing many WIA members, *"Who do I contact with my problem"*, has been around for a long time. Nor is it new to our sister societies overseas.

The WIA is also approaching the stage where we too will be able to publish our directory in Amateur Radio magazine. This has come about after much hard work behind the scenes by members of the Executive. You will recall in late 1988 the WIA conducted a members survey using an insert in Amateur Radio magazine. After analysing the results of the survey we had a better picture of what services you, the members, wanted out of the WIA. The follow-on from that survey was to determine just what was being done for members and where it was being done. The *"who does what for whom and where is it done"* activity.

These actions led to a Federal council resolution being adopted last February. That resolution recognised the balance of provision of members services across Executive Office and the Divisions. It spelled them out in some detail and the Executive Office list became the agreed services list for office staffing and funding. Unfortunately there were more desirable services than the WIA could fund, so the list was produced in priority order. This means the General Manager, when drafting the WIA's budget proposals each year, has to advise Executive which activities are likely to roll off the bottom.

The Divisions did not get off lightly either, for their Federal Councillors agreed on a guideline list of Divisional services each would aim to provide. For a wise Division this provides a very good indication of where funds are required and permits budgeting for following years. We must not neglect the third list, a list of desirable services that need further investigation and costing to test their viability.

So you might ask how does this affect me, a member residing out there somewhere in Australia. Well, many of the practices that have grown up over past years have now been formalised. Executive Office knows what is expected of it and so do the Divisions. There is nothing like working to clear directions which are known to all.

So that is where the WIA Directory comes in. The members need to know where to go or who to call for a particular members' service.

The WIA Directory will appear shortly in Amateur Radio magazine. We will attempt to get it all on one page and we will try to keep it up to date and reprint it a couple of times a year. In exchange we ask

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570 MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO Box 1066 Parramatta) 2124 Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100 - 1400 Wed 1900 - 2100)	VK2ZIG VK2YEL VK2AOE	From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only): 1.845 AM; 3.595 AM morning and SSB evening; 7.146 AM*; 10.125 SSB; On relay 14.160 SSB* and 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; On relay 584.750 ATV sound; 1281.750 FM. Plus automatic relays to 2m repeaters surrounding Sydney and manual to several country repeaters. News headlines by phone (02) 552 5188.	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK3	Victorian Division 38 Taylor St Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) $69.00 (G) (S) $55.00 (X) $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK4ER VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT)3.555, 146.500, 0900 hrs Sunday	(F) $67.50 (G) (S) $54.00 (X) $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland - Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 146.700 at 1900 hrs.	(F) $59.00 (G) (S) $47.50 (X) $32.00
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne TAS 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) $65.00 (G) (S) $52.00 (X) $38.00
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).					

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three year membership available to (F) (G) (X) grades at fee x 3 times

you to consult it before reaching for the phone, or popping that letter in the box.

Please direct your inquiries to the contact shown in the WIA Directory. Your query will be processed quicker, less effort will be needed to redirect it, and everyone will win!

Examinations Update

WIA Exam Service is now accepting applications for accreditation from persons wishing to become accredited examiners under the new amateur examinations system. Existing examiners should be aware that materials which have been accredited by DoTC, but not used, can still be used by them up until 31st December 1991. However, after that time, the only source of examinations will be **WIA Exam Service**.

While endeavouring to provide as wide a service as possible to allow access to examinations by all candidates, whatever their geographic location in Australia or its territories, the WIA does not wish to over extend the goodwill of the amateur community by over-supply of examinations. In most areas, two or three accredited examiners will be able to supply the needs of all applicants. Clubs as such cannot be accredited, but may nominate members for accreditation, and provide additional supervisors if the number of candidates is too high for the two accredited examiners.

T-Shirt Badges

The South Australian Division of the WIA has recently produced a WIA logo, similar to the Car Badge logo, suitable for applying to T-shirts or skivvies by an iron-on process. It comes with full instructions for application. The Division quotes prices as $2.00 each, plus a stamped addressed envelope, for up to 9 badges. Ten or more badges are post free. Individuals, Clubs or Divisions are welcome to order.

AMSAT-NA Technical Symposium

Papers are invited for the 1991 AMSAT Technical Symposium sponsored by the Radio Amateur Satellite Corporation-North America to be held on the 9-10th November in Los Angeles.

On the 8th November, at the same locality, there will be a joint AMSAT/ARRL Educational Workshop with the theme *"Uses of Amateur Radio Satellites in Education"*.

Papers for both are due by 1st October. Further information from Lori Weinberg at ARRL Headquarters, telephone 1 203 666 1541 or fax 1 203 665 7531.

DoTC Amateur Station Statistics

The recent release of the 30th June 1991 quarterly statistics of licensed amateur radio stations caused some confusion in the Executive Office when it was noted that the total number of licensed amateurs in each state, and in total, was significantly less than the corresponding total for the March 1991 statistics.

Telephone calls to DoTC eventually established that a clean up of the their database had occurred which eliminated a considerable number of call signs which had been reserved but not issued. This means that the June statistics should be the most accurate so far received from DoTC. According to these figures, the total number of amateur stations, including repeaters and beacons, in Australia is 18,938, of whom 10,855 hold an unrestricted licence.

EMI Standards

The August issue of *"The Australian Standard"*, the journal of Standards Australia, has a lead article on the history and present status of electro-magnetic interference controls. It separates the general problem of electro-magnetic compatibility into the two fields of emission (limitation of level of interference caused) and immunity (ability to perform satisfactorily in the presence of an agreed level of interference).

Although many countries have, over the years, established their own separate limits for EMC, they have recently realised the advantages of having internationally accepted standards. The European Commission has decreed that as from January 1992, EC and European Free Trade Association countries shall have mandatory EMC requirements for all electrical products marketed in their area. The standards are based on those prepared by CISPR.

USA limits also appear to be falling into line with the CISPR standards.

In Australia, independent testing for EMI may be certified by AUSTEL, but the acceptability of these tests by the EC is yet to be proved. DoTC is considering making EMI compliance mandatory in Australia. Compliance is already mandatory for equipment connected to telecommunications networks. Australia is a member of each CISPR Committee, and has adopted the CISPR EMI standards as national standards. So, it looks as though we may eventually have some official relief from some of our interference problems.

1992 Call Book Available

The new **1992 Australian Radio Amateur Call Book** is now available for you to purchase. Production of the Call book entailed considerable time and effort on the part of the Executive Office staff at the same time as they were heavily involved in preparation for the new amateur examinations system.

This year's edition should be the most accurate yet produced. All the entries have been proofread, and the information from DoTC matched to that on the WIA membership records.

Special thanks go to the VK2 and VK6 volunteers who proofed their Divisional lists, as well as those members of the Publications Committee who gave an evening of assistance.

The 1992 Call Book lists nearly 19,000 individual call signs as well as SWLs, the usual reference information of repeater lists, beacons, band plans and DXCC countries, etc.. We are sure all members will want a new edition as soon as they see it. Look for it at your Divisional Bookshops, but do not wait too long as already the orders are rolling in. At the time of preparing this news item, over two thirds of the print run of the Call Book had already been presold.

If you can't beat 'em, join 'em...

The Executive Office is proud to announce that another staff member has joined the ranks of licensed amateurs. Chris Russell, who has worked part time as a clerical assistant in the office since December 1989, decided early this year that she needed to know more about the *"product"* of the organisation for whom she worked.

Although Chris knew virtually nothing about amateur radio, and admits that she had no conception of components or principles, she joined the Victorian Division classes shortly after they began in February. As time passed some other class members fell by the wayside, but Chris kept struggling on and passed the Regulations exam in May.

By sheer hard work (and with the tolerance of other office staff beleaguered by her many questions) Chris prepared for the Novice Theory and 5 wpm CW examinations, which she passed in August at her first attempt. Well done, Chris. Now there are only three part-timers for us to urge towards that piece of paper.

Executive Office Upgrade

After nearly 12 years at the present venue, the WIA was finding both work space and storage facilities in the Executive Office inadequate for efficient functioning. A survey of other possible accommodation quickly showed that, although plenty of office space was available at competitive rates, the location and facilities of the present site could not be bettered.

The end result is that the Executive Office is remaining at its present location. We have been able to extend the existing space by including a small adjoining room. With a coat of paint and some reorganising of the furniture, the office is now far more comfortable and efficient and will be able to accommodate the quarterly meetings of Executive and Federal Councillors without the scene resembling the proverbial *"sardines in a can"*.

Sincere thanks are due to those members who gave considerable time and effort to moving furniture, magazines, stationery, etc.. Reg Southwood VK3CCE, in particular, deserves our thanks for many hours of valuable assistance.

Computers Again

At last all the trauma and stress of the change-over of the Executive Office computers to a network is past and the network is finally fully functional. It took nearly four months before the last *"bugs"* were fixed. Those of you who have been through the experience of setting up a network where each computer is a different brand and configuration know what we have been through.

The network has stood up to the hard work of preparing for the Call Book and the examinations without any hiccups. Although there were times when we could cheerfully have gone back to the original stand-alone system, it must be admitted that the functioning network has increased office efficiency and reduced the work load on the staff.

In addition, it allows us to respond to members' queries more promptly as data will not be tied up when, for example, the membership computer is generating labels or statistics.

Off to Bandung

In early October, the WIA delegation to the IARU Region III Conference in Bandung will set forth for a few days of intense discussion and negotiations. Unfortunately, at this late stage one of the appointed delegates, George Brzostowski VK1GB, has had to withdraw because of other commitments.

The WIA is most grateful to Kevin Olds VK1OK, who has stepped in to ensure that the delegation is fully staffed. As many sessions are conducted concurrently, it is of vital importance that our delegation be large enough to cover all the interest areas.

JOTA

Once again it is almost time for JOTA. This is the time of the year when temporary masts and wires spring up above Scout and Guide halls and camps, so that young people can enjoy perhaps their first experience of talking *"on air"* to an unseen fellow scouter or guider.

Many of our present members became interested in amateur radio after participating in a Jamboree Of The Air and, although the present generation is more experienced in radios than was the case previously, there is still much for amateur radio to offer.

This is an ideal chance to show what amateur radio can do, and a chance for many members to put something back into the hobby. Even if you do not participate at a JOTA station, please be aware that the event is on, and cooperate with the JOTA stations by being patient and helpful with the youngsters if they wish to talk to you or if they happen to be tying up your favourite frequency.

Gladesville - AUSSAT Test

The fourth test in the Gladesville - AUSSAT series was scheduled for transmission on Wednesday 25th September. The major theme was to be AUSSAT itself. The test was expected to be on the usual transponder with a south-east beam and a spot towards Perth.

AUSSAT and JOTA

A feature of recent Jamborees of the Air in Australia has been the linking of repeater networks through the communications satellite, AUSSAT. Permission has been given again this year to AUSSAT by DoTC for the provision of up and down links by AUSSAT during the JOTA on the weekend of 19 - 20th October 1991.

70th Anniversary

A circular from the Finnish Amateur Radio League, which arrived by fax only at the beginning of September, announces that SARL is celebrating its 70th Anniversary in September 1991.

Unfortunately this information arrived too late for all our members to be notified of the use of the special prefix "OF" instead of the normal "OH" during the month of September, but now you know what it was all about.

A special SARL 70 Award has been published to commemorate the anniversary. More details are available from SRAL Headquarters, PO Box 44, SF-00441 Helsinki, Finland.

ARRL Books

Recent publications announced as available by the ARRL, a prolific publisher of amateur radio books, include the *Proceedings of the ARRL National Education Workshop*, and the *International Amateur Radio Study Guide*. These new books should be available shortly from the WIA Divisional Bookshops.

50 MHz Beacons

A note from John Martin VK3ZJC, the chairman of the WIA Federal Technical Advisory Committee, points out that only one response has been received so far to the proposal for 50 MHz beacons in the eastern states of Australia.

As a decision about this important question is to be made at the October meeting of the WIA Federal Council, time is running short for input from the users of the 6 metre band. The proposal, briefly, is to allot extra frequencies in the DX window, giving preference to frequencies between 50.053 and 50.063 MHz. The number of channels available is strictly limited and it is proposed at this stage to limit 50 MHz beacons to one each in VK3 and VK7, and two each in VK1/2 and VK4.

This means that six channels will be earmarked. One of these is already in use by VK3SIX, and a second has been earmarked for a beacon in the Hobart area which should begin trial operations shortly.

If there are any objections to this proposal, please write immediately to John Martin at PO Box 300, Caulfield South, 3162. There is no point in waiting until the decision is made and then complaining about it.

New VHF Records

John Martin VK3ZJC, chairman of FTAC, has advised of five new 6 metre records, three of which are long path contacts which were not usually recognised in the past.

Congratulations are due to the following:
NATIONAL RECORD: VK3OT to 9Q5EE on 06/04/91 27186 km
VK1 RECORD: VK1RX to KP4A on 08/04/91 16082 km
VK2 RECORD: VK2BBR to 6W1QC on 02/03/91 21384 km
VK4 RECORD: VK4ZAZ to 6W1QC on 02/03/91 21741 km
MOBILE RECORD: VK4ZAZ/M to FM5WD on 06/04/91 16243 km.

1991 VK-ZL-Oceania Contest

Members are reminded that the 1991 VK-ZL-Oceania contest is to be held on the first two weekends in October. The SSB contest runs from 1000 hours UTC on 5th October to 1000 hours on 6th October, and the CW section runs during the same times on 12 - 13th October.

Full rules were published in the July 1991 issue of Amateur Radio magazine, but note that the start and finish times are as given above.

Remember also that the ALARA contest takes place next month, and that log summaries for the 1991 Remembrance Day contest must reach the Contest manager by 4th October this year.

Buyer Beware

Advertising literature and sales pitches are widely known to need careful interpretation in some cases. An instance of this in the field of amateur radio has been brought to the attention of the WIA regarding the differences in radio equipment produced for different markets.

Those who purchase a "bargain" either overseas or locally may find that the set is not appropriate for the Australian scene, leading to expensive and possibly illegal modifications, or else may be liable for full customs duty.

Sets which have been brought into the country and modified here in an attempt to equal those designed for Australia are liable to still be inferior even after modification. There will probably also be warranty and repair problems.

As the WIA has stated previously, the safest and cheapest procedure is to buy in Australia from the reputable authorised agents for each brand name.

Albania Prepares for Amateur Radio

Amateurs around the world are preparing to welcome Albania to the amateur radio community. The ARRL newsletter of 24th August 1991 reports on the announcement in Tokyo by the Secretary General of the Albanian Department of Posts and Telecommunications that amateur radio will return to Albania in September.

An international group of amateurs, representing a number of national societies, will spend four weeks in Albania to assist with training the local enthusiasts in both radio theory and operating techniques. Yaesu has donated some equipment in preparation for the start of on-air operating, probably after 14 - 15th September. No call signs have yet been announced, but SSB and CW operation on the 20, 15 and 10 metre bands has been suggested.

Russia Establishes Amateur Radio Emergency Service

The same ARRL newsletter notes discussions and informal agreements between the ARRL and amateurs in the Russian Republic of the USSR on the use and potential of amateur radio in emergency situations.

The newly formed RARES is associated with Red Cross and Red Crescent. Joint conferences between **RARES** and ARRL, and mutual participation in exercises and relief operations, are in the plans.

Camp Quality On Air

A call from VK5 advised that Charles VK5CQ will be setting up a station at the South Australian Camp Quality site from 30th September to 4th October. We understand that there will be several of these camps throughout Australia at that time, and the question is *"Are any other camps planning to have an amateur station and, if so, can contacts be arranged?"*

If members have information on this, or can offer assistance, would they please contact Charles Waite VK5CQ, by telephoning his pager service on 016 88 9105 and leaving a contact number or suggesting a time and frequency, or else via the VK5 2 metre Bulletin board.

Magazine Identity

The *Over to You* columns in Amateur Radio magazine of late have contained a number of letters discussing the possibility of amalgamation between Amateur Radio magazine and other magazines catering to a similar market niche.

A responsibility of WIA management is continually to examine all possible options for improving service to members, and reducing the costs of providing those services. In recent years the WIA has prepared several detailed analyses of the possible benefits and costs of amalgamation or integration of our magazine with other publications, and has decided each time that the disadvantages far outweigh the benefits.

An independent Amateur Radio magazine is seen by the majority of members as an essential forum to enable them to air their views, publish technical articles, report on radio activities and keep in touch with the status of amateur radio related affairs throughout the world.

It is a tribute to the standing of Amateur Radio magazine, and essential for the future of the WIA, that members feel free to question policy and offer constructive criticism.

We assure them that the management of the WIA is prepared to receive and consider any suggestions which may benefit members.

Examination Costing

One of the hardest tasks associated with the establishment of the new **WIA Exam Service** has been the determining of the fees to be charged for the examinations. Under the devolved system no fees were set by DoTC, in the belief that market forces would operate.

When the **WIA Exam Service** begins as from 1st October, accredited examiners will purchase examination materials from **WIA Exam Service** at set prices, but will be free to make an additional charge to candidates for their services if they so desire to cover their operating costs.

Without a clear figure of the likely demand for examination materials, projections have had to be made on estimates based on a variety of sources of information. In setting their fees **WIA Exam Service** has been very conscious that the WIA membership should not subsidise the exams from their membership fees, and at the same time exam candidates should not subsidise WIA membership fees.

WIA Exam Service is very pleased to announce that the costs to accredited examiners for individual sections, or subjects, of the examinations have been kept to a lower level than first anticipated.

Quarterly Federal Council Meeting

The weekend of 26 - 27th October will be the occasion for another meeting of the complete Executive and Federal Council of the WIA.

A number of items are already on the agenda, including the repeater and beacon planning and discussion on further deregulation of the Amateur Service.

DoTC has suggested that there are a number of areas in which amateurs should be able to manage their own affairs. A committee is currently considering this, and will report at the October meeting.

Members who wish to have input should contact their Divisional Federal Councillors. The October quarterly meeting will also spend time on the budget, and membership fees, for 1992.

International Representation Fund Donations

Since our last acknowledgment donations to this important fighting fund have been received from the following:

B Dunkley VK3EWD
G Jenkinson VK3BBK
F Edgar Nicholls VK7RY
Moorabbin and District Amateur Radio Club
Canberra Radio Society.

The WIA has thanked these contributors individually. This acknowledgment is a public record of the WIA's appreciation.

Inquiry into Radio Frequency Spectrum Management

In June 1990 the House of Representatives Standing Committee on Transport, Communications and Infrastructure began an inquiry into the management of the radio frequency spectrum. Since then five public hearings have been held and 39 submissions received.

In June 1991 a discussion paper was circulated asking for responses to specific questions which had emerged.

The WIA sent a submission last year, and responded to the discussion paper in due course, emphasising the value to the community of frequency allocations which are not sold to the highest bidder, but are maintained as the "National Parks" for recreation and community service.

The WIA is continuing to monitor the progress of this inquiry.

Divisional Bookshops

Each month's issue of the WIA's own magazine, Amateur Radio, carries an advertisement for books and other items available from the Divisional Bookshops.

Members are asked to note that these items are not available from the Executive Office, but only from your Division.

If orders are received at the Executive Office they must be forwarded to the appropriate Division.

This of course delays the fulfilment of the order.

If there are items you would like to be made available, or books which you have found that you think should be on the list, please approach your Division with your suggestion.

Would you like to be able to buy mugs, spoons, coasters, glasses, etc. with the WIA logo on them? Talk to your Division.

ar

TECHNICAL CORRESPONDENCE

Old Time Art

I was recently looking for some information on the Bellini-Tosi Direction Finder, so went to the Admiralty Handbook and, in browsing, came across the information shown below.

The procedure is so far removed from the actions and knowledge of our present-day amateurs, I thought it may deserve a place in *AR*, if only to show those AMTOR/packet people what they have missed!!

Only 60 years ago and this book was the state of the art.

Rod Torrington VK3TJ
4 Thistle St
Pascoe Vale South 3044

From page 880 of *The Admiralty Handbook of Wireless Telegraphy 1931*

832. **Practical Points in Tuning Spark Primaries**

The following special precautions should be observed in tuning the primaries of spark transmitting circuits:

(a) Use a coupling between wavemeter mutual and primary which gives a maximum of about half the scale reading of the galvanometer.

(b) Sparking must be steady and even. The key should be pressed so as to give evenly spaced "shorts". A continuous "long" should not be made, as the gap will get very hot and the plugs be burned away.

(c) The plugs should be clean and not pitted.

(d) In sets where a rotary gap is fitted this should be kept running.

(e) Great care must be taken in adjusting a fixed gap and suiting the AC voltage to it. If the gap is too short for the supply voltage, "arcing" will occur, ie current from the transformer will flow across the gap without charging the condenser. If too long, a combination of "one spark per cycle" and "one spark per half cycle" may be produced, with resultant uneven sparking voltage.

(f) Sparking in a wavemeter condenser should not be allowed. This can generally be obviated by loosening the coupling to the oscillatory circuit.

(g) The mutual coil of the aerial circuit should be disconnected.

Pre-Selector

It is worth noting that Drew Diamond's Converter, *AR* June '91, can be modified into a handy pre-selector. Switch off the oscillator, disconnect the output tuned circuit and replace it with a toroid wound for a 3:1 reduction ratio. Terminate the low side in a 3dB 50ohm T pad for RF stage stability if the Rx is disconnected, and as the source impedance for the receiver input. This is not a high-gain set-up; there is no point in encouraging overloading! The objective is a maximum rejection of unwanted signals and to prevent the generation of spurious ones through inter-modulation.

Robert R McGregor
VK3XZ
2 Wiltshire Drive
Somerville 3912

Tuning Refinements

It was great to see and read the resurrection by Rod VK3TJ of a true basis for antenna tuning, one that can match the diversity of input conditions that occur at the end of an antenna. Here are a few additions that will not change the circuit but improve its versatility.

Tapped coils can be difficult, electrically, when only a few turns are used. Solution: wind another smaller, one quarter to one fifth inductance, also tapped. This allows a finer adjustment, but importantly, when only a small inductance is required, the larger one can be shorted out. Place the coil axes at right angles for zero coupling. Another tip from the past.

If two gang bc condensers are used the frames are, of course, insulated from earth. Then it is often convenient to connect between the two stator terminals for half C and twice the voltage rating, can be handy at C2 in some situations. Likewise, the ability to parallel the two sections can be handy at C1.

I like four inches (100mm) of insulated rod to the tuning knob, reduces RF burns and hand capacity, hi.

Robert R McGregor
VK3XZ
2 Wiltshire Drive
Somerville 3912

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The Luxembourg Effect - An Ionospheric Funny

ANDREW WOOLF VK2EPO
14 DENNIS ST
GREYSTANES 2145

Are you located in the vicinity of a high-powered medium frequency broadcasting transmitter? Can you produce a strong signal on 160 or 80m CW? Then read on about how you may be able to observe an unusual radio propagation effect first reported more than 50 years ago.

1. Introduction

AS ANY AMATEUR WHO has used the HF bands will know, the ionosphere is a strange creature, at times well behaved and predictable, at other times violent and unco-operative. In attempting to understand the workings of the ionosphere, researchers have discovered many unexpected phenomena. The very broad field of nonlinear ionospheric physics is one area which is responsible for a number of such phenomena, and in which a lot of research is currently being pursued. One particular aspect, however, that has been known since the 1930s, is now well understood and may be of interest to other radio amateurs. "Nonlinear two-wave interaction", or "ionospheric cross-modulation" was first reported by Tellegen[1] in the international scientific journal *Nature*, in 1933. Located at Eindhoven, Holland, he noticed that if he tuned his radio receiver to Beromünster (460m), he often heard background modulation from the new high-powered broadcast station at Luxembourg (1190m). He eliminated the possibility of cross-modulation in his receiver, as well as disturbances from his town's electrical distribution system. He also noted the fact that Luxembourg is situated almost on the line directly joining Beromünster and Eindhoven (see Fig 1). Following this initial observation, he found that the Luxembourg modulation could also be heard with a number of other broadcast stations, all lying somewhat in the direction from Eindhoven to Luxembourg, but farther away than Luxembourg. His conclusion was that the phenomenon had its origin somewhere in the transmission between these stations and Eindhoven.

Evidence mounted that the "Luxembourg effect", as it became known, was due to a nonlinear effect in the ionosphere, and in 1934 Bailey and Martyn suggested[2,3] that this nonlinearity occurred in the process of absorption of the waves. The quantitative theory they developed explained the observations very well. Over the next several years, detailed investigations were made[7-13], both theoretical and experimental, and since the Second World War the phenomenon has been understood well enough to be used as a tool for investigation of the ionosphere. It is worthwhile noting here that, as with many other areas of ionospheric physics, Australian researchers figured prominently in the study of the effect. Bailey and Martyn were both Australian, as were several other key researchers in the field, notably Huxley, Hibberd, Pawsey etc. The WIA was even mentioned in at least one paper[4].

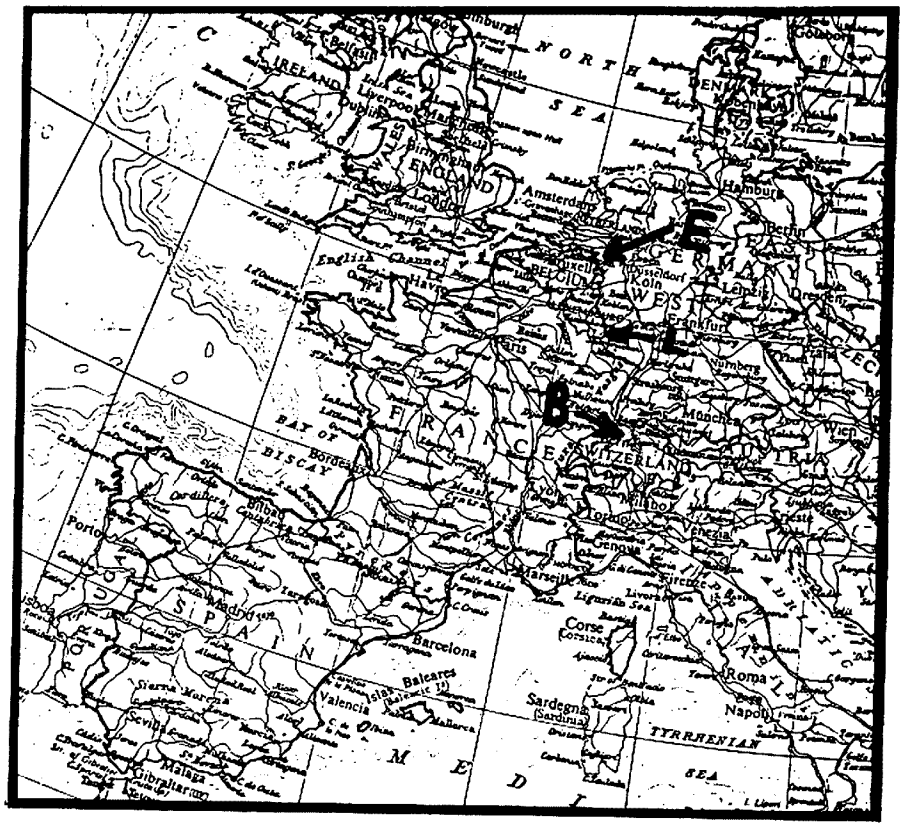

Figure 1: Location of Tellegen's initial observation

The rest of this article is organised as follows: Section 2 reviews some important concepts from ionospheric physics in this context; Section 3 contains a descriptive physical explanation of ionospheric cross-modulation; and Section 4 describes one of the ways the phenomenon has been used as a tool in ionospheric investigation. Section 3 also discusses the possibility of amateur observation of ionospheric cross-modulation.

2. Ionospheric Physics Revisited

It will be recalled that the ionosphere is "... that part of [the atmosphere[where ions and electrons are present in quantities sufficient to affect the propagation of radio waves"[6].

This ionisation occurs through the action of the sun's radiation on the various gas molecules present. The degree of ionisation depends on a number of factors, including the density of gas particles, the

temperature of the particles, intensity of the solar radiation etc. The ionisation is characterised by an *electron density profile, N(h),* which gives the electron density N as a function of height h. Fig 2 shows some idealised profiles. As can be seen, N increases with height up to about 300km. The appearance of peaks in these profiles gives rise to the usual classification of the ionosphere into the *D region* (from heights 40km to 90km), the *E region* (90km to 160km) and the *F region* (>160km).

Another parameter that is important in ionospheric physics is the *electron collision frequency, v.* This is the average rate at which free electrons collide with heavy particles (ions, molecules). This collision frequency also depends on height, but, unlike electron density, it decreases with increasing altitude. Fig 3 shows a typical electron collision frequency profile. The decrease in collision frequency with height is as one would expect, since the atmosphere becomes more rarefied at height, and so particles have fewer collisions in general.

An effect which amateurs will be familiar with (particularly if their antennas are as lousy as mine!) is the absorption of waves by the ionosphere. Some quite extensive mathematical equations describing absorption have been derived, and are beyond the scope of this article. Suffice to say that ionospheric absorption is measured by an *absorption coefficient, k,* which is essentially proportional to the electron density and the collision frequency at a particular wave frequency and height, ie

$$k \propto Nv.$$

A bit of thought shows why absorption mostly occurs in the lower regions of the ionosphere. As mentioned above, N increases with height and v decreases with height. However, v decreases faster than N increases. The product Nv, then, has a maximum which, as it turns out, occurs in the D region or lower E region.

One further concept that is needed from ionospheric physics in order to understand ionospheric cross-modulation is the idea of electron temperature. We think of the temperature of a gas as being a measure of the average kinetic energy of the particles. The faster the particles are moving, the higher the gas's temperature. So, too, with electrons in the ionosphere. We can talk about the *electron temperature,* T_e, keeping in mind that this refers in some sense to the rms speed of the electrons. The electron temperature and collision frequency are related as follows:

$$v \propto \sqrt{T_e}$$

(for collisions with molecules - the dominant case).

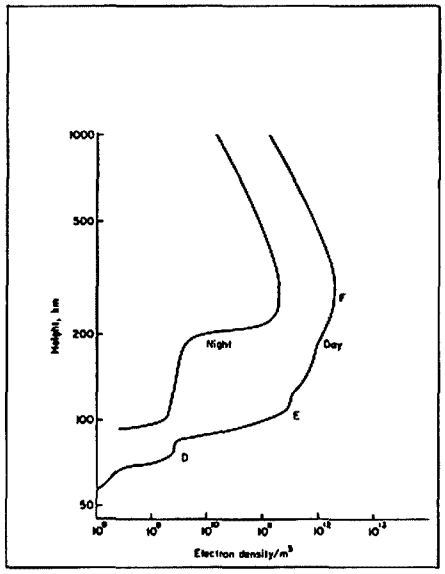

Figure 2: Idealised electron density profiles (from [16])

To summarise this section, one need only remember that radio waves are absorbed as they traverse the ionosphere, and that absorption at a particular height and wave frequency is proportional to both the electron density and the collision frequency at that height. Also, the collision frequency is proportional to the square root of the electron temperature.

3. Ionospheric Cross-Modulation

It is conventional in any discussion of ionospheric cross-modulation to speak of the "wanted wave" and the "disturbing wave". Ionospheric cross-modulation, as with receiver cross-modulation, results in the transfer of modulation from the disturbing wave to the wanted wave. In the ionospheric case, this transfer of modulation occurs as both waves pass through the same region of the ionosphere, called the "region of cross-modulation". This terminology is illustrated

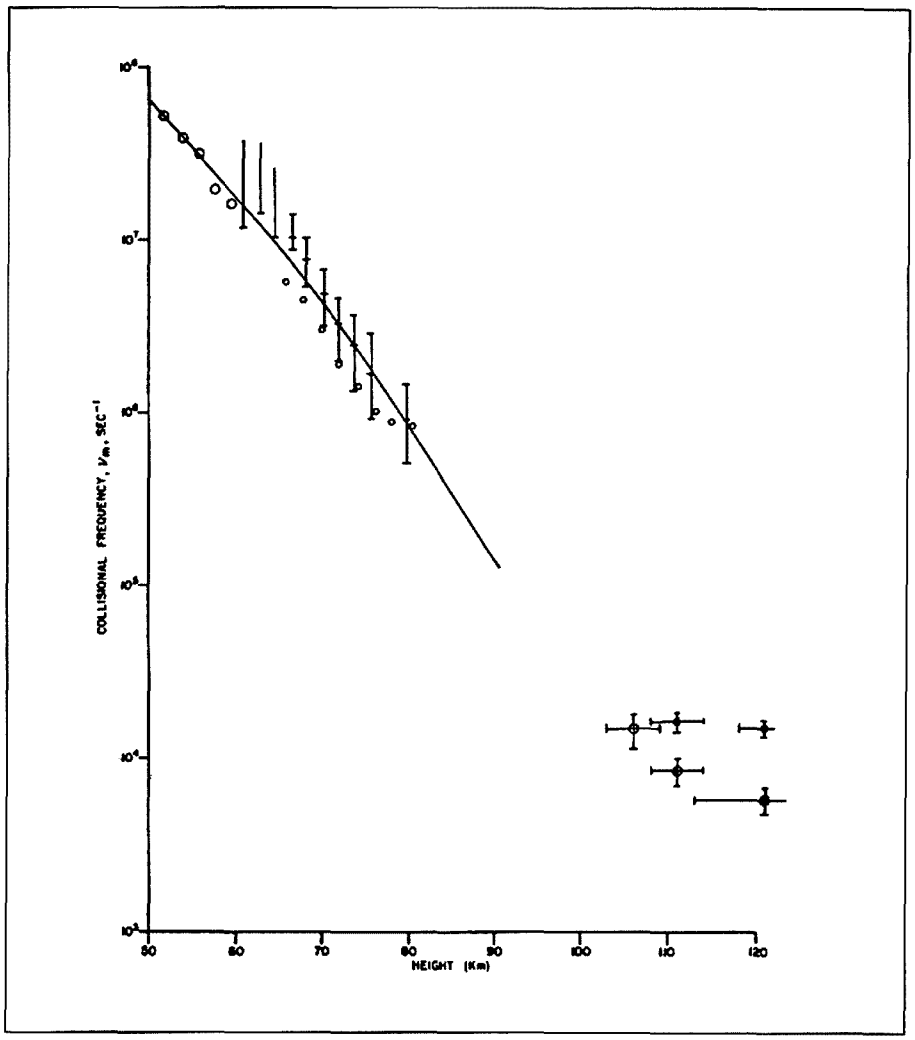

Figure 3: Electron collision frequency profile (from [15].

diagrammatically in Fig 4.

From the previous section, we know that the absorption of a wave in the ionosphere is proportional to the electron collision frequency which, in turn, is proportional to the square root of electron temperature. Suppose that the electron temperature was changed somehow. This would then change the collision frequency and the absorption coefficient; an increase in electron temperature would increase the absorption, a decrease in T_e would decrease the absorption. The strength of a wave passing through this region would decrease or increase, respectively. Now consider what would happen if a very strong RF wave could "heat" the electrons. The above argument shows that turning such a wave on would increase ionospheric absorption in the region it heats. The strength of another wave passing through the same region would be reduced. If the strong heating wave (the disturbing wave) was amplitude modulated, the electron temperature would become modulated, causing the collision frequency and absorption coefficient to become modulated. Another wave passing through the region (the wanted wave) would then also become amplitude modulated because of the varying absorption. This is the essence of ionospheric cross-modulation. It can be shown that the heating effect of a wave is given by the following equation:

$$\Delta T_e = \frac{e^2 E_0^2}{3mk\delta\,(\nu_0^2 + \omega^2)}$$

where

ΔT_e = increase in electron temperature, K,
e = charge on electron, $1.6 \times 10^{-19} C$
E_0 = amplitude of disturbing wave, V/m,
m = mass of electron, $9.1 \times 10^{-31} kg$,
k = Boltzmann's constant, $1.38 \times 10^{-23} J/K$,
δ = fraction of electron's energy lost in a collision, = 2×10^{-3}
ν_0 = undisturbed electron collision frequency,
w = $2\pi f$= angular frequency of disturbing wave, rad/s.

Table 1 lists some typical percentage increases in electron temperature for several locations in the ionosphere and several powers and frequencies of disturbing waves. From this we can see that only very high powered, medium frequency waves can significantly affect the electron temperature.

Mathematical expressions can be derived for the actual depth of cross-modulation produced on the wanted wave. It turns out that cross-modulation is produced at the modulating frequency and twice the modulating frequency of the disturbing wave, although the latter is much weaker. Rather than give the full equations for the cross-modulation depth, which can get rather messy, I will instead look at the dependence of the transferred modulation on various parameters.

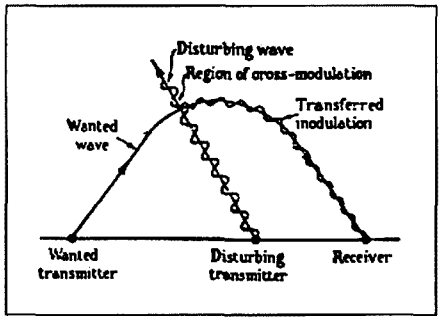

Figure 4: Nomenclature in ionospheric cross-modulation (from [14])

3.1 Dependence on Modulation Frequency

The transferred modulation obeys the following relation:

$$M \propto \frac{1}{\sqrt{(\delta\nu_0)^2 + \Omega^2}}$$

where

M = wanted wave cross-modulation depth,
δ, ν_0 = as before,
Ω = modulation frequency.

Fig 5 shows a plot of this variation. The dots on this graph show experimentally determined points. It can be seen that the theoretical curve is quite consistent with experiment. This curve also shows that the cross-modulation depth is strongest at low modulation frequencies.

3.2 Dependence on Power of Disturbing Wave

Both theory and experiment show that the depth of cross-modulation is proportional to the power of the disturbing wave.

3.3 Dependence on Modulation Depth of Disturbing Wave

Again, theory and experiment both show that the cross-modulation depth is proportional to the modulation depth of the disturbing wave.

3.4 Dependence on Frequency of Disturbing Wave

Theory predicts the dependence on disturbing wave frequency to be given by:

$$M \propto \frac{1}{\omega^2 + \nu_0^2}$$

This seems to have been borne out in practice. It is clear that cross-modulation will be more pronounced the lower the frequency of the disturbing transmitter. This is in accordance with the observation earlier that the lower the frequency of the transmitter, the better it is at heating the electrons in the ionosphere.

3.5 Dependence on Frequency of Wanted Wave

Since cross-modulation is due to nonlinear absorption, the effect will be strongest when both waves are absorbed most strongly in the same region of the ionosphere. This implies that cross-modulation will be most noticeable if the wanted wave is reflected from the lower regions of the ionosphere, ie if it is fairly low in frequency.

3.6 Dependence on Earth's Magnetic Field

The fact that the earth has a magnetic field alters the results for dependence on disturbing wave frequency somewhat. The modified form of the earlier relation is:

$$M \propto \frac{1}{(\omega - \omega_p)^2 + \nu_0^2}$$

Ionosphere	Frequency (MHz)	ΔT_e (%) 10kw	100kw	200kw	500kw	1000kw
D layer (daytime)	< 0.48	0.2	2	4	10	20
$\nu_0 = 10^7$	1.6	0.1	1	2	5	10
$T_e = 300°K$	16	0.002	0.02	0.04	0.1	0.2
$\delta = 2 \times 10^{-3}$						
h = 60km						
Lower part of E layer (night)	< 0.03	30	140	210	360	570
$\nu_0 = 7 \times 10^5$	0.16	10	80	140	270	430
$T_e = 200°K$	0.32	4	30	60	150	270
$\delta = 2 \times 10^{-3}$	0.80	0.6	6	10	30	60
h = 90km	1.6	0.2	2	3	8	20
	16	0.002	0.02	0.03	0.08	0.2
F layer	16	0.0004	0.0004	0.0008	0.002	0.004
$\nu_0 = 10^3$						
$T_e = 2000°K$						
$\delta = 10^{-4}$						
h = 300km						

Table 1: Increases in electron temperature for different powers and heights

where w_p is the so-called gyro-frequency and depends on the local value of the earth's magnetic field. Typically, the gyro-frequency would be around 1500kHz. Theory predicts that a "resonance" would occur if the disturbing wave frequency is equal to the gyro-frequency and there is some evidence that significant increases in cross-modulation depth do occur as the disturbing wave frequency passes through the gyro-frequency[4]. However, the gyro-frequency generally varies greatly with position in the ionosphere so that this gyro-resonance is not often observed.

3.7 Amateur Observation of Ionospheric Cross-Modulation

From all the above considerations, ionospheric cross-modulation is most likely to be experienced in an amateur radio context on either 160m or 80m. The received signal would have to be mostly skywave, and there would most likely be a high powered medium frequency AM broadcast station situated about halfway between one amateur station and the other. The cross-modulation would best be observed using AM, or just transmitting a carrier wave.

4. Use of Ionospheric Cross-Modulation for Ionospheric Diagnostics

This section outlines a method due originally to Fejer[6] for using ionospheric cross-modulation to determine electron densities and collision frequencies in the lower ionosphere.

Referring to Fig 6, the experimental set-up consists of two pulsed transmitters and a receiver, all at the same site. The receiver is tuned to receive the reflected pulses from the wanted transmitter. These pulses are sent with a certain repetition rate. Now consider the disturbing transmitter. As the RF pulse from this transmitter travels upwards, it heats the ionosphere. At some point it will meet up with the reflected wanted pulse. Suppose this happens at a height h_o. Then for the rest of its trip back to the receiver, the wanted pulse will be more

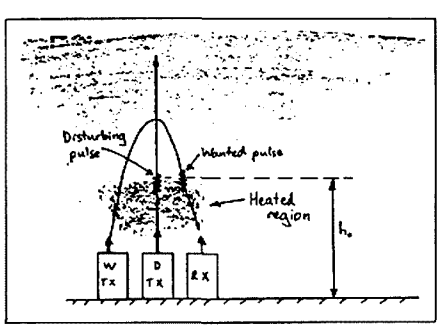

Figure 6: Fejer's experimental set-up

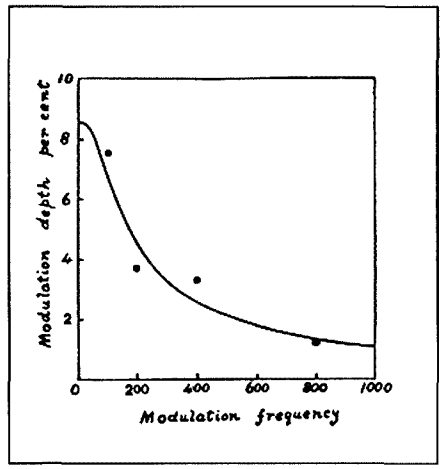

Figure 5: Variation of cross-modulation depth with modulation frequency (from [7])

strongly absorbed, since it is travelling through a heated part of the ionosphere. If the disturbing pulse is sent at a time t_0 before the arrival of the wanted pulse on the ground, then the height h_o is given by $h_o = ct_0/2$, where c is the speed of light. The repetition rate of the disturbing pulse is half of the wanted pulse, so that only every second received pulse is affected. By observing the amplitudes and phases of successive received wanted pulses, calculations can be done to find the electron density and collision frequency at height h_o. Further, by varying the time t_0 at which the disturbing pulse is transmitted, the height h_o can be varied, and so electron density profiles and collision frequency profiles can be determined. Fejer's initial results are shown in Fig 7.

5. Conclusion

The phenomenon of ionospheric cross-modulation has been described and explained. The dependence of cross-modulation depth on various parameters has been considered, and one method of using it to probe the ionosphere has been described. The possibility of amateur observation of the phenomenon has also been mentioned. Finally, I would be interested to hear from anyone who believes they have observed ionospheric cross-modulation.

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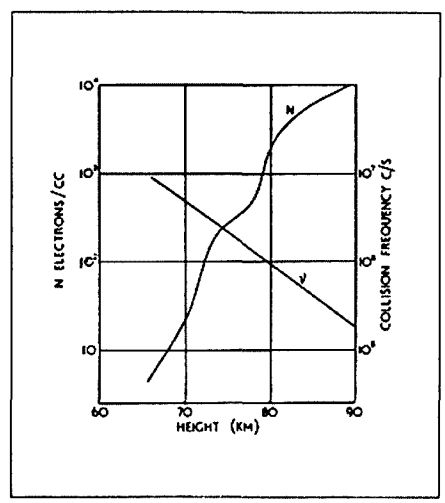


Figure 7: Fejer's results (from [6])

(The highest powered MF transmitter used in Australia is 50kW and there are 13 transmitters of this power operating, all carrying the National broadcasting service (ABC). A selection of these is: 549kHz 2CR Cumnock, 594kHz 3WV Horsham, 630kHz 4QN Townsville, 729kHz 5CL Adelaide, 774kHz 3LO Melbourne, and 558kHz 6WA Wagin. Don't forget to make allowance for the low angle of radiation from these services when looking at suitable paths for observation. Good luck! Tech Ed). **ar**

Modifications to Tiltover Mast

P GLAVIMANS VK3BK
47 HEATHMONT RD
RINGWOOD 3134

MODIFICATIONS CAN improve the tiltover mast described by Leigh Baker VK5WO in *AR* September 1989.

The scrap angle iron welded to part of the post which goes in the ground were welded at right angles to each other to give a better "grip" in the concrete base.

The upper mast was moved 180° and now will come down with its carriage to, and rest on, the winch mount which is welded across the whole of the steel post and protrudes about 15cm at the back of it. The guide rail has to be moved accordingly. The winch is mounted level with the rear end of this mount. This gives enough room for the upper mast carriage to go past the winch and rest on the winch mount. The guide rail needs to be extended by approximately 21cm. A piece of 25mm angle iron is bolted on the bottom mast for the carriage to rest on. This angle iron can be removed so the upper mast can be slipped off for maintenance or removal of tower.

The automatic lock-in device, see pic 1, is spring loaded at the rear and stopped from tilting down when the mast is not in a vertical position with a bolt screwed into the rear of the steel post. When the tower is brought back into vertical position, the auto locking device will fall over the shaft sticking out through the bottom mast. This shaft is 10mm round iron and is held in place with split pins. The auto locking device is hinged with a round iron shaft 10mm in diameter and held in place with split pins. The iron shaft goes right through the steel post.

The roller bearings suggested are likely to rust and were replaced by turned-down roller skate wheels with aluminium inserts and stainless steel washers on either side to keep them in place.

Also, two heavy prongs, see pic 1, were welded just underneath the winch mount at either side of the steel post. A heavy chain link was welded on one side. See pic 2. The other side of the chain was welded to the other prong.

A lock protects the tower from being tilted over by any unwelcome visitors. Also, a large chain around the carriage and winch handle was used for security

Photo 1: Automatic lock-in device

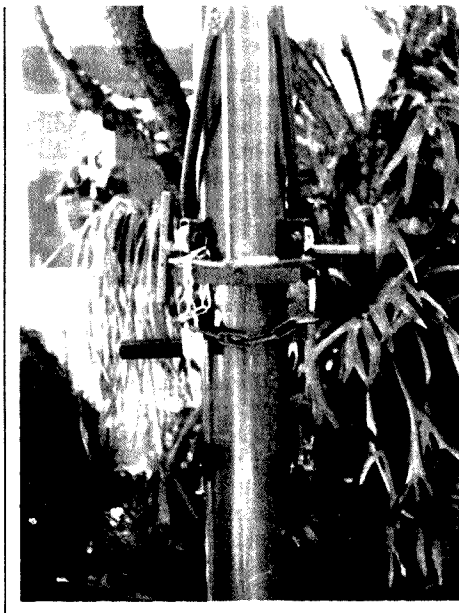


Photo 2: A view at right angles to photo 1.

reasons instead of the one seen in pic 2 using the same lock.

The next is very important. A Tee piece is inserted through the bottom mast just above the carriage and protrudes about 10cm out the other side. This device prevents the upper mast from being pulled up when tilting over the tower.

I painted the handle red. Always keep it in place! To wind the upper mast up, remove this handle.

All cables were fed through the centre of the upper mast to come out at the bottom through a 2.5cm hole. The lot was painted green to fit in with the green trees etc.

If you have $200 spare, replace the winch with a clutch-type winch for safety.

My many thanks go to Peter Webb, Technical Services Director with The Trailer Factory, Bayswater, Melbourne, for suggestions and putting it all together. Thanks also to my daughter Roseanne for letting Peter work many nights on this job.

ar

WIA Victorian Division is Moving Office

The Victorian Division Office will be moving to 40G Victory Boulevard, Ashburton 3147 in mid-October.

The new office will be located in premises the Division purchased in June this year.

Hours of business remain unchanged — 8.30am to 3.30pm on Tuesday and Thursday.

The telephone number is unchanged, 885 9261, and the fax number 885 9298.

During the move the office will be closed for all business on 15 and 17 October and will reopen on 22 October.

The Unipole Antenna for Two Metres

DES GREENHAM VK3CO
16 CLYDESDALE CRT
MOOROOPNA 3629

OVER THE YEARS WE HAVE seen innumerable 2m antennas described in technical publications, each making extravagant claims to performance. Since the advent of novice licensees using the 2m band, along with the increase in repeater installations across the countryside, it seems appropriate to once again describe a simple 2m antenna that can be constructed with the minimum of mechanical ability and cost.

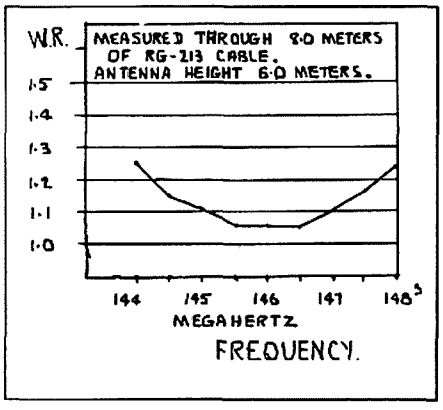
This antenna is the "Unipole". It is basically a quarter-wavelength antenna with the usual quarter-wave performance. The major difference is that it is a "folded" quarter-wave or half of a standard folded dipole used commonly on Yagis etc.

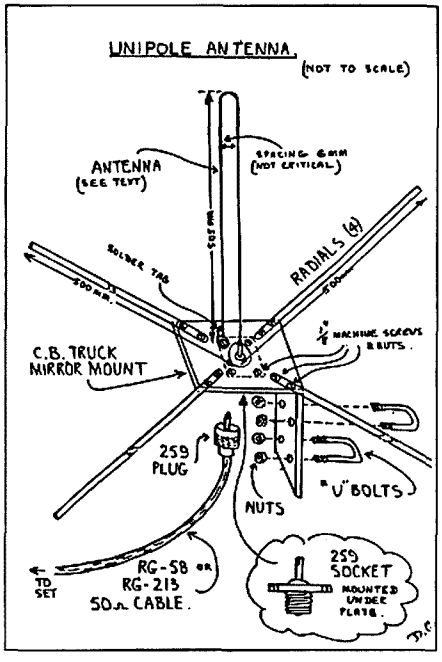
The usual quarter-wave vertical antenna does not present a 50-ohm impedance at its base. To obtain this necessary figure, the antenna is slightly lengthened, thus making it no longer a true quarter-wavelength antenna. To produce the more correct quarter-wavelength with a 50-ohm base impedance, this antenna is "folded" and hence the name unipole.

Performance of this antenna has been noted to be marginally better than a normal quarter-wave vertical, and the impedance match (SWR) is certainly better with a broader frequency range.

The construction is simple using readily available components along with some "junk box bits". The main component is a standard CB type "mirror mount" bracket used to mount whips on the heavy duty mirrors of trucks. These are readily available from most CB shops at a moderate price. Of course, those with workshop facilities could easily fabricate a bracket from 3/16" aluminium plate along with suitable 1/4" U-bolts.

A Standard PL259 flange type chassis socket is mounted on the bracket using four machine screws. There may be a need to ream the hole slightly if the socket doesn't fit. This requires the use of a small file and some muscle. Place a solder tag under one of the mounting screws to terminate one end of the antenna. The radials are made from aluminium tubing of any diameter between 1/4" and 1/2". Scrap from old TV antennas is most suitable. The radials are attached to the bracket with pop rivets, self-tapping screws, or small 1/8" diameter machine screws. The radials need to be mounted solidly as they will no doubt be used as a convenient perching spot for the local birds.





The antenna proper can be made from any available suitable material such as aluminium, wire or brass. Copper wire salvaged from old transformers or electric motors can be used providing it is at least 1.5mm in diameter. Any thinner wire tends to be too fragile. Perhaps the best material to use is 1/8" bronze welding rods. These are available in various lengths, and if one length is not long enough to form the antenna, a soldered joint can be easily made at the top bend of the antenna.

Of course, bronze solders well, and a good connection can be made to the PL259 socket and earth tag secured under the mounting screw. Prior to final connection, a good clean with steel wool will make for easier soldering.

When completed, the antenna can be checked using a good quality SWR meter. However, if one is not available, the antenna can be used as is because experience has shown that the SWR is normally low and no adjustment is necessary (see SWR graph measured using an RG-213 lead eight metres long).

In common with all antennas, the coaxial cable used should be of good quality with minimum loss. RG-58 is suitable for runs up to five metres, with RG-213 better for greater distances. *(Don't forget to waterproof the exposed end of the coax cable at the antenna to prevent water getting into the cable and spoiling it - Ed).* The antenna should be mounted on a mast at maximum available height and in the clear.

The antenna is "omnidirectional", ie it radiates equally in all directions, so there is no problem with having to rotate it. With this antenna mounted on a chimney or similar structure, and using a standard 2m radio, good repeater access is assured as well as good simplex range : All this without too much strain on the wallet!!! ar

Getting Started with Amateur Radio Satellites

Part 9 – A hitch-hiker's guide to orbital geometry.

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD
YARRAVILLE 3013

I KNOW THAT THOSE OF YOU who have followed the first eight parts in this series won't be put off by the title. I referred briefly to orbital geometry and Keplerian elements in part 4 and advised you to go off and read a textbook about it. Since then I've been asked to come up with a simple explanatory article. Well, there isn't really a simple way to do it, but I'll try to keep the jargon and maths down to a minimum.

Simply put, orbital geometry means a complete description of the shape and position of a satellite's orbit. Once we understand a bit about orbital geometry, we can make sense of these Keplerian element things everyone seems to be talking about these days. Satellite orbits are in general very stable, but all satellites experience very small variations in their orbital shape and position. These tiny fluctuations are caused by non-uniformities in the earth's gravitational and magnetic fields and the gravitational influence of the moon and the sun. They may be of significance to NASA in long-term orbital decay predictions, but to the casual satellite user (that's us) their effect can be neglected. The experts call them perturbations.

So, in order to describe a satellite's orbit, what do we need to know? Fortunately for us, Kepler did most of the groundwork a long time ago, and he did it without the aid of computers. He was looking at the orbits of large planetary bodies, but the principle holds good for home-made planets as well.

There are eight things we need to know about a satellite's orbit in order to describe it sufficiently accurately for our requirements. These properties or definitions are called Keplerian elements in honour of Kepler. Let's examine them in turn.

But, first, who so many? Well, remembering Murphy, the main reason is that even orbits that we refer to as being "circular" are really slightly elliptical. Some are very close to being truly circular but, since none actually is, we need to define their exact elliptical shape. And that's not easy.

The first of our Keplerian elements is the **eccentricity.** It's a measure of the elliptical nature of the orbit. A truly circular orbit would have an eccentricity of zero. For those mathematicians among us, the eccentricity is defined as SQR((1-(b/a)^2)) where b and a are the semi-minor and semi-major axes of the ellipse respectively.

As an example, the eccentricity of the low-earth orbit "circular" satellites is typically around 0.001, and the highly elliptical phase 3 satellites around 0.6 to 0.7. The longer and thinner an orbit, the greater the eccentricity. AUSSAT and other geostationary satellites typically have an eccentricity of about 0.0001. There are no units for eccentricity, it is an expression of condition rather than quantity. An orbit can never have an eccentricity of exactly 1. Can you see why?

Before we can go any further you need to be familiar with the term **ascending node.** This is not a Keplerian element, it is a point on the equatorial plane where the satellite's orbit crosses the equatorial plane going from south to north. There is, of course, another one on the other side called the descending node, but it is the ascending node that is used in describing the orbit.

We can now look at the next Keplerian element, **inclination.** In theory, a satellite can be made to orbit anywhere around the earth, but some positions are much more useful than others. A low-earth satellite's range of communication can vary from a few hundred to a few thousand kilometres, depending on its height above ground. If set into an orbit around the equator, it will never "see" any more than a thin strip of the earth plus and minus 15 or 20 degrees latitude. This may be all you're interested in, but it's more likely that a greater coverage would be required.

If a satellite is set into orbit around the poles, ie a polar orbit, it will cover the entire surface of the earth twice each day. This is because inertia keeps the orbit stable against the star background and the earth rotates inside the orbit. The effect is that from the observer's point of view, the satellite appears to pass over different places each time it orbits the earth.

The **inclination** of the orbit is the angle (in degrees) between the earth's equatorial plane and the satellite's orbital plane. The angle is measured anti-clockwise from the equatorial plane, about the ascending node. In the case of low-earth, near-polar satellites, this angle is usually between 80 degrees and 100 degrees In the case of very large and heavy satellites like MIR and the space shuttle, the inclination is usually much lower. This is because inclination is a function of launch latitude. In launching very large satellites, advantage is taken of the rotation of the earth, ie the "sling-shot" effect. By launching in a west-to-east direction less power is required in the launch vehicle. This results in a lower, but generally satisfactory inclination, of between 30 and 50 degrees depending on the launching facility latitude. (Look up the inclination of MIR and STS).

Now things start to get a bit more complicated. We know that the earth is rotating on its axis. One revolution takes approximately 24 hours. Wait a minute, that seems like a funny thing to say. Everyone knows the earth takes EXACTLY 24 hours to do one revolution! Oh yes, try again. What we call a 24-hour day is very handy for us in that it brings us back to roughly the same position relative to the sun each day. But we're not in exactly the same position as far as the background star-field is concerned. We know the earth orbits around the sun. If we took the stars as a reference for our "24 hour" day, then night would literally turn into day on our clocks by halfway through the year! This would make things a bit difficult so we synchronise our clocks to the sun rather than the star-field. We have to resort to leap years and leap seconds to keep things in order in the long term. Now what does this have to do with satellite orbital geometry?

Since the earth revolves on its axis, and the sun appears to move in our sky, and the moon's orbit does crazy things we won't even go into here, we can't use any of these as a reference to describe a satellite orbit. The best and most stable thing we have is the background star-

field. A common reference point used in astronomy is Aries, and it is this star system that is used in establishing a reference for all man-made satellite orbits. The reference is called "the first point in Aries".

Now this next bit is probably the hardest to grasp, but here goes. A Keplerian element called the RAAN or RA is used to fix the orbit in space, ie in reference to the background star-field. It's full name is very grand indeed. It is called the Right Ascension of the Ascending Node. This is an angle in degrees measured between two lines. The first is a line from the centre of the earth to the first point in Aries. The second is a line taken from the centre of the earth to the point of intersection of the celestial equator (not the earth's equator) and the hour circle of the ascending node. The celestial equator can best be described by envisaging the stars of the night sky as if they were painted on the inside of a huge sphere. Polaris, the north pole star marks the north pole of the sphere and the extension of the earth's equatorial plane out onto the sphere would be the celestial equator. The line out through the right ascension casts a point onto the celestial equator and the angle between that point and the first point in Aries (as viewed from the centre of the earth) is the RAAN, whew! I warned you it was complicated. If you want to understand this one better I suggest you get hold of a good basic astronomy book and read up on right ascension, declination and GHA.

In an ideal system the RAAN would be held absolutely constant by inertia. Murphy as usual, sees to it that things don't work out that way and the RAAN changes a little each day due to the non-spherical nature of the earth. Satellite designers make use of this phenomenon when choosing an orbit for low-earth orbit satellites. By selecting the correct orbital geometry, particularly the inclination, the RAAN can be made to slip or precess by about one degree per day, ie about 360 degrees per year. This makes the orbit sun-synchronous. The orbit will always look the same if viewed from the sun. It's then a lot easier for designers to work out a long-term power budget since satellites are mostly solar powered and the amount of power depends on the angle at which the sun's rays hit the solar cells.

If you follow the published sets of Keplerian elements you will see that the RAAN of many of the low-earth satellites change by about one degree per day.

Two more definitions at this stage, although you've heard the terms before. The **apogee** is the point of the elliptical orbit farthest out from earth. The **perigee** is the point closest to earth. They lie at opposite ends of the major axis of the orbital ellipse. In order to work out where a satellite is in our sky at any given time (and that's the purpose of the exercise), we need to establish exactly the position of the ellipse around the earth. This is done by measuring another angle called the **argument** of **perigee.** We've established the ascending node earlier, so now we can define the argument of perigee by measuring the angle between the ascending node and the perigee point. This is measured in the orbital plane, looking from the centre of the earth.

The next Keplerian element is the **mean motion.** This is the opposite or reciprocal of the orbital period of the satellite. It is measured in revolutions per day, whereas period is measured in minutes per revolution. Mean motion is usually quoted to an accuracy of eight decimal places.

That just about describes the orbit completely but we need another element to work out where the satellite is around the ellipse at any particular time. This is called the **mean anomaly.** It is the angle (looking from the centre of the earth) between the perigee point and the satellite at the instant when all the other measurements were taken.

The **mean anomaly** is a very important point for all our computer calculations, so it needs a time reference. This pinpoint in time is known as the **epoch time** and, although not strictly an orbital element, it is published along with the elements as they would be meaningless without a time reference. It usually takes the form of year, day, decimal day. It will look something like 91213.12345678 ie, year = 1991, day number 213, plus (0.12345678) of a day. It is the instant when someone pushed a button to send a radar ranging signal up towards the satellite. Using doppler shift analysis on the return signals, all the Keplerian elements can be calculated to describe the orbit.

Once again in an ideal situation, that would be all that's necessary to work out just about everything we need to know about the satellite's position. But, once again, things are less than ideal. The culprit this time is Murphy's atmospheric drag.

All man-made satellites experience atmospheric drag. In the case of the geostationary satellites it is so small it can be neglected. The same is almost true for the high orbit Oscars like 10 and 13. Their drag is very low but cannot be completely neglected. Satellites in low-earth orbit, however, experience considerable drag and this is what ultimately causes the orbit to decay into the atmosphere and the satellite to burn up.

It can't be regarded as a true "Keplerian element", but the atmospheric drag is published along with the Keps in the normal element set. It is called **drag** or **decay rate** or N dot. In maths terms it is half of the second derivative of the mean motion. That is, the rate of increase of the mean motion per day per day. It is in fact an acceleration. It's usually specified as a very small decimal fraction of a rev/day/day. Typically values of **decay** for Oscars 10/13 would be 0.0000001 whilst for Oscars like Uosat would be 0.00001 rev/day/day. This figure is often given in exponent notation as (again typically) 1.4e-5 rev/day/day. It is the rate at which the orbital period is decreasing each day.

This is a bit strange because, if the period decreases, the mean motion increases, and that means the satellite goes faster. One would expect that if drag is "holding the satellite back" then its velocity would decrease. Strange as it may seem, it does actually go faster. This is because all the drag factors combine to slightly decrease the satellite's altitude, and that means it has to go faster to maintain orbit. It will continue to increase in velocity until its orbit takes it so far into the atmosphere that it burns up. If drag caused it to slow down then some sort of balance would be set up and it would stay up there forever. That doesn't happen. As an example, the mean motion figure for UoSat-2 for day 62 of 1989 was 14.630744. By day 80 of 1991 it had increased to 14.664819. An increase of 0.034 of an orbit per day in about two years. In that time UoSat-2's orbital velocity had increased from 27057kph in 1989 to 27078kph in 1991. Its altitude had decreased from 686 to 675km in that time. When launched on 1 March 1984, UoSat-2 had an altitude of nearly 700km. You can see that after some 38,000 orbits the drag is starting to take effect, causing a more rapid decline in altitude. But it still has a long way to go. When launched it had an estimated orbit life of about 50 years.

I know of two excellent texts on this subject. I recommend that you read them. The first and most useful is the document file contained in Franklin Antonio's excellent graphic tracking program, Instantrack. This is a very "down to earth" version (excuse the pun). The other is in the UoSat handbook, available from Amsat-UK or the University of Surrey. This is a more technical, but still easy-to-handle, version.

The Keplerian elements so derived are published regularly and used widely by amateurs and professionals to keep track of satellites. They are plugged into computer programs which work on them to give antenna pointing co-ordinates and other useful information.

Next month I'll discuss how computer programs handle the Keps and detail some of the software available. **ar**

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Morse Code 6 Tapes Novice Code Course - Gordon West	BX229	$63.90
Morse Code Tapes Set 1: 5-10 WPM - ARRL	BX331	$16.70
Morse Code Tapes Set 2: 10-15 WPM - ARRL	BX332	$16.70
Morse Code Tapes Set 3: 15-22 WPM - ARRL	BX333	$16.70
Morse Code Tapes Set 4: 13-14 WPM - ARRL	BX334	$16.70
Morse Tutor 5.25 Inch IBM Disk	BX187	$16.70
OPERATING		
Amateur Radio Awards Book - RSGB	BX297	$27.00
DXCC Companion - 1990	BX345	$10.80
Low Band DXing - John Devoldere	BX195	$18.00
Maidenhead Locator-Grid Atlas - ARRL	BX197	$9.00
Operating Manual - ARRL - 1990	BX192	$27.00
Operating Manual - RSGB - 1985	BX359	$25.20
Passport to World Band Radio 1991	BX346	$30.60
Prefix Map - The World Flat on Heavy Paper	BX335	$14.40
Prefix Map of North America	BX235	$7.20
Prefix Map of The World	BX234	$7.20
Radio Amateurs World Map	BX236	$7.20
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The Complete DXer - Bob Locher - 1989	BX194	$18.00
Transmitter Hunting - TAB - 1987	BX222	$32.30
PACKET RADIO BOOKS		
AX.25 Link Layer Protocol - ARRL	BX178	$14.40
Computer Networking Con (Packet) No 5 1986 - ARRL	BX167	$18.00
Computer Networking Con (Packet) No 6 1987 - ARRL	BX168	$18.00
Computer Networking Con (Packet) No 7 1988 - ARRL	BX184	$22.50
Computer Networking Con (Packet) No 8 1989 - ARRL	BX295	$21.60
Computer Networking Con (Packet) No 9 1990 - ARRL	BX360	$21.60
Computer Networking Conf (Packet) 1-4 1982/5	BX166	$32.40
Gateway to Packet Radio 2nd edition - ARRL	BX169	$21.60
Packet Radio Made Easy - Rogers	MFJ32	$18.50
Packet Users Notebook - Rogers	BX285	$16.70
SATELLITE BOOKS		
Oscar Satellite Review - Ingram - 1988	MFJ31	$15.30
Satellite AMSAT-NA 5th Symposium 1987 - ARRL	BX182	$15.80
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Satellite Anthology - ARRL	BX180	$14.40
Satellite Experimenters Handbook 1990 edition	BX177	$36.00
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Weather Satellite Handbook Software only - ARRL	BX326	$18.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio - Orr - 1988	BX216	$15.60
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Microwave Update Con. 1987 - ARRL	BX174	$15.80
Microwave Update Con. 1988 - ARRL	BX163	$15.80
Microwave Update Con. 1989 - ARRL	BX321	$21.60
Mid Atlantic VHF Con. October 1987 - ARRL	BX175	$15.80
Spread Spectrum Source Book - ARRL - 1991	BX365	$36.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$67.50
UHF Compendium Part 3 & 4 Vol 2	BX251	$67.50
UHF Compendium Part 5 German Only	BX354	$67.50
UHF/Microwave Experimenters Manual - ARRL - 1990	BX325	$36.00
UHF/Microwave Experimenters Software 5 inch Disk - ARRL	BX327	$18.00
VHF 21st Central States Con. 1987 - ARRL	BX172	$15.80
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VHF 23rd Central States Con. 1989 - ARRL	BX286	$15.80
VHF 24th Central States Con. 1990 - ARRL	BX322	$21.60
VHF/UHF Manual - RSGB	BX267	$43.20
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WIA Car Window Stickers		$0.50
WIA Tape - Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book - 1992		$10.00
Band Plans Booklet		$2.80
WIA Log Book - Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all items above are available from all Divisions (and none are available from the Executive Office).
If the item is carried by your Divisional Bookshop, but is not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.

The Field Day Friend

TOM ALLEN VK7AL
22 KAROOLA RD
LINDISFARNE 7015

I HAVE NEVER BEEN A GOOD stone thrower, yet many a time on a field day I have endeavoured to cause a stone suitably(?) tied to a rock with a length of fishing line attached, to clear a tree branch, at say 30 feet, only to record a clear miss or to see the arrangement fall apart halfway up.

Certain states, I believe, allow the use of an ancient, but efficient, slingshot to be used by radio amateurs for the erection of aerials for field day use, so I decided that such an article would be a suitable addition to the assorted aerials (wire) and lengths of rope in the boot of the car. However, being unable to find any details on construction, I decided that some non-amateur experimentation was necessary.

List of Materials

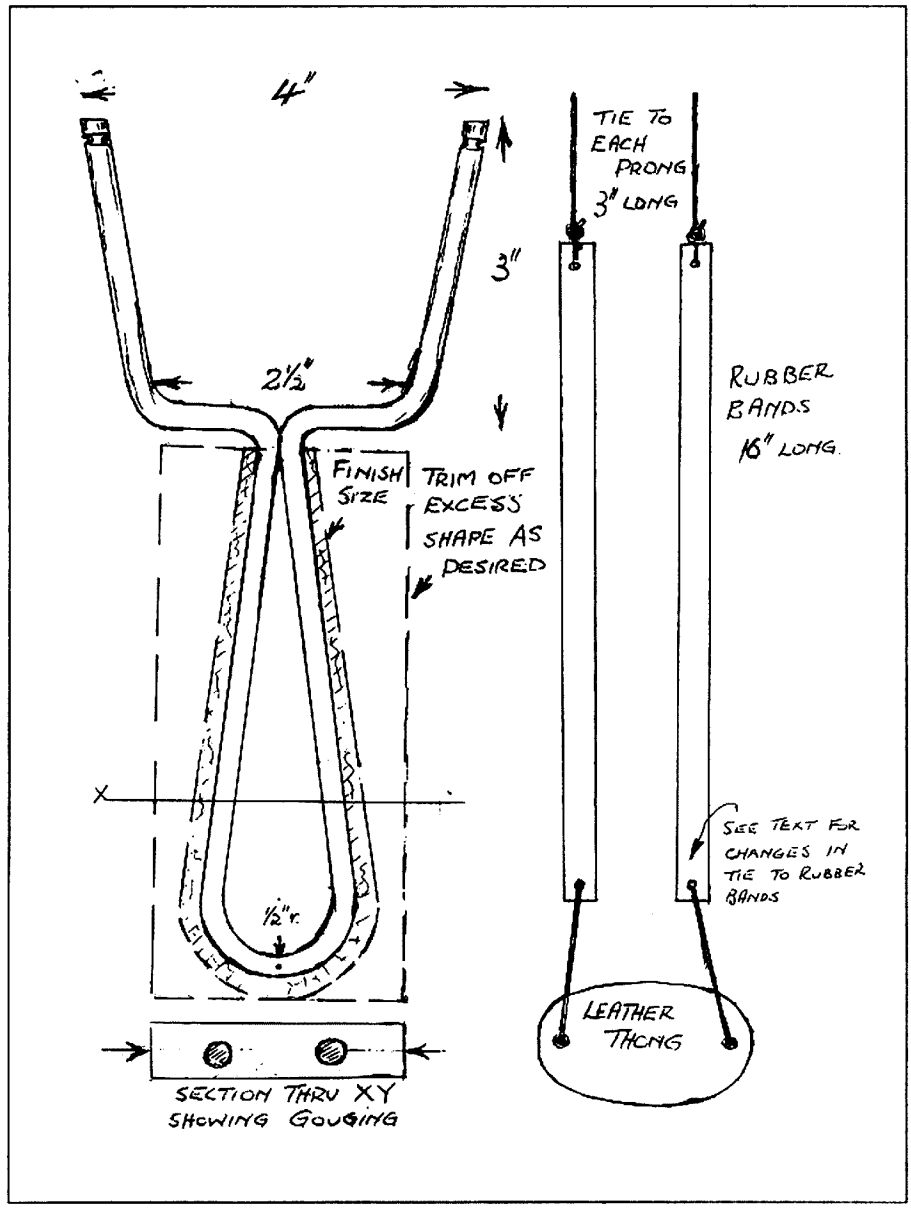
Piece of mild steel rod 20" x 3/16"
Hank green fishing line 1.5mm dia
Lead sinker pear shaped 2oz
Rubber bands 1/2" wide 8" dia (1/8" square section would be better)
Piece of leather for thong (boot upper)
Soft pine for handle 2 pcs 5-1/2" x 2" x 1/4"

Construction

1. Centre punch the centre of the length of mild steel then bend to shape as per diagram - a gas torch would be a help in making the bends much more easily. Stick as close to the measurements as possible unless you have big hands and massive shoulders.

2. Having successfully bent the prong to shape use the closed section as your pattern for making ready your two pieces of handle for the gouging procedure. Ensure the handle parts fit snugly around the prong. For the handle parts, I obtained from a cabinetmaker a couple of pieces of King Billy pine, a nice soft wood for easy working. It is strong when glued along its full length, and finishes well. When you have trimmed the excess and arrived at the finished size, a couple of coats of polyurethane clear varnish finish the job.

3. The tie at each end of the rubber is not satisfactory through holes as shown, as the holes tend to become slots at the most inopportune time! Fold the ends over for about 1/2" and tie around the fold tightly for a much better result.



4. About 1/4" down from the top of each prong make a shallow indentation to prevent the top ties from sliding down the prong. Complete the sling as shown, and there you have your non-technical, non-electronic, easily operated, getter-overer for field days.

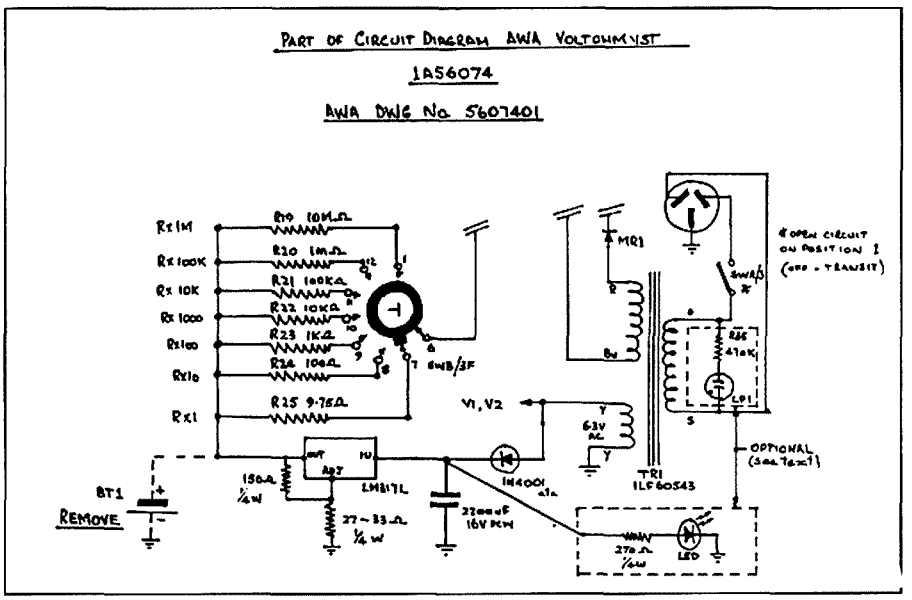
The final word is that these things are **dangerous** in the **wrong hands** and should be kept in the locked car boot out of reach of children. Good luck, good shooting and better aerials for field days.-

(Thanks to the late Ken Gott VK3AJU, these devices are now legal in Victoria when used by radio amateurs for the approriate purpose. The legal position in other states is not known - Ed)

Modifications to the 'AWA' Voltohmyst

(1A56704 or 2A56704 Versions)

JOHN WEIR VK3ZRV
20 SCENIC CRES
ELTHAM NORTH 3095



THERE ARE PROBABLY A number of people like me who have in their possession a Voltohmyst which is pressed into service at some time or other in the shack. About this time the problems start. Namely, you cannot set the ohms because the battery has gone flat, or at the worst has leaked all over the innards of the unit, with drastic results. An added hazard is that the neon power lamp has gone black or does not work, although the latter problem does not stop you using the unit. It is a pity to have a piece of equipment where all functions or facilities are not working.

This modification overcomes these problems and also enhances the look of the Voltohmyst in respect to modern-day test equipment. The complete modification requires only four resistors, one power diode, one LED and a low-power three-terminal adjustable voltage regulator.

The actual fitting of the parts involved I will leave to the ingenuity of the person carrying out the modification. Another important factor is that there is no need to drill holes or deface the basic unit in any way when these changes are made, and also it does not change the calibration settings of the unit.

From the diagram you will see that I have used the 6.3VAC filament winding and half-wave rectified it with a diode and smoothing capacitor before feeding the resultant DC to the input terminal of an LM317L (TO92) three-terminal voltage regulator. The resistor values shown will give approximately 1.5VDC at the output terminal, which is connected in place of the 1.5V battery. Should you require the replacement of the neon "power on" lamp you will need to remove the neon and the 470k resistor and replace it with a LED (your choice of colour) and a series dropping resistor. A convenient tie point for the LED is the tagstrip behind the meter where the neon was located.

Having done these changes you will have no more trouble with flat or leaky batteries or neons that do not work and you will have confidence that when you want to use the Voltohmyst all the functions will be operable. An SASE to me (QTHR) will receive a prompt reply should you run into any difficulties.

ar

Mini Equipment Reviews

RON FISHER VK3OM

THIS MONTH IN MINI REVIEWS we will take a look at two very useful antenna accessories from the extensive range of Stewart Electronic Components P/L of 44 Stafford Street, Huntingdale, Victoria. Stewart is Australian agent for many American companies, and one of the more recent of these is AMERITRON. Amongst their range, I spotted just the thing I was looking for, the RCS-4 remote coax switch.

When I was installing my new antenna system out here in the bush, I came across a problem. With the main antennas about 70 metres away from the house, I needed either a lot of low-loss coax or a single run of coax and a remote switch. The RCS-4 was indeed the answer. And I now have only one run of coax,

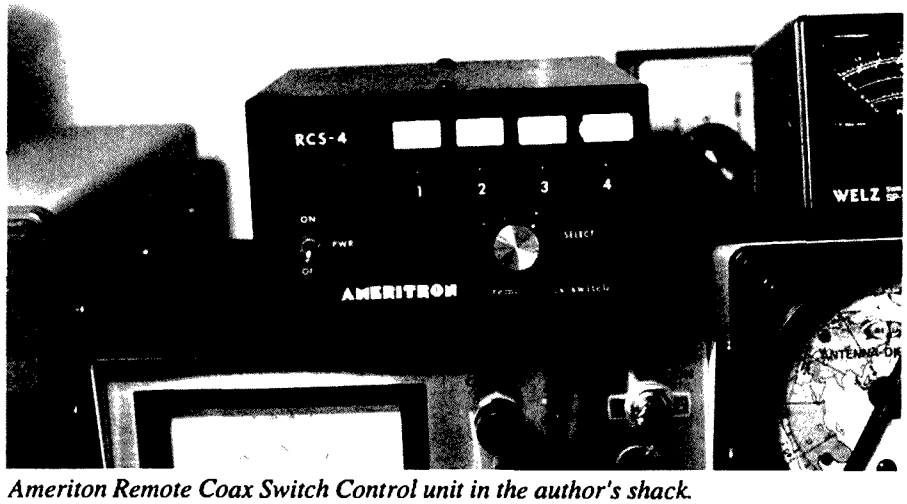
I lashed out and got some Belden 9913 which reduced the losses to a very low figure. The RCS-4 comes in two parts, the control unit that sits on the operating desk, and the actual remote switch that goes as close to the antennas as possible. But the best part is yet to come.

The RCS-4 does not require a separate cable to operate the switching circuits. It all goes via the coax cable. The circuit is simple and very clever. With no power supplied from the control box, antenna No 4 is selected. Three relays are used to switch the other three antenna connections.

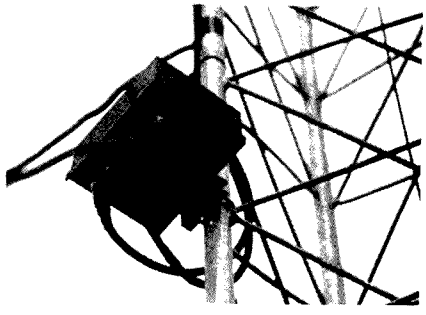
These are activated by sending up the coax either positive DC, negative DC or AC power. The coax is, of course, isolated by blocking capacitors so that the voltage does not get into the antenna or the receiver. Very clever. Ameritron claims an overall loss of less than .05dB and a VSWR of less than 1.1:1 up to 30MHz.

It should be noted that this unit is for use on the HF bands only up to 30MHz. I have now had the RCS-4 in use for several months with excellent results. If you need to switch antennas up to 250MHz, Stewart also stocks the RCS-8V which allows selection of five antennas but requires a separate control cable. The RCS-4 is priced at $354 and the RCS-8V at $409.20.

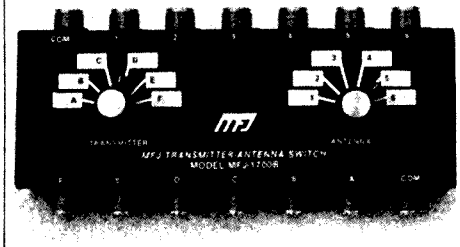
While at Stewarts a few weeks ago, I noticed the MFJ Transmitter/Antenna Switch model MFJ-1700B. MFJ is another American company represented in Australia by Stewart. The 1700B is quite a switch. In fact, it is two switches in one. The combinations are endless, but as a basis it can switch six antennas to six transceivers. The unit is very well made and is fully enclosed in a strong metal cabinet; the switches are heavy duty ceramic insulated, and the unused connectors are automatically grounded. It is rated at 2000 watts PEP for 50 or 70 ohm loads. The MFJ-1700B is usable to 30MHz. A great way to clean up the RF switching around the shack. The MFJ-1700B is priced at $140. ar



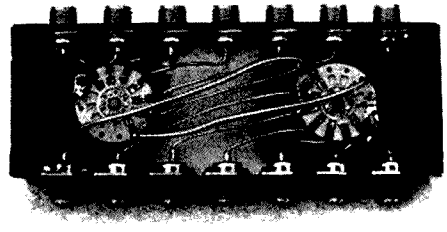
Ameriton Remote Coax Switch Control unit in the author's shack.



Ameriton Remote Switch mounted on the tower.



MFJ Antenna Switch



MFJ Switch Interior

HELP STAMP OUT STOLEN EQUIPMENT - ALWAYS INCLUDE THE SERIAL NUMBER OF YOUR EQUIPMENT IN YOUR HAMAD

Equipment Review

The Yaesu FT-990HF All-Mode Transceiver

RON FISHER VK3OM
GAALANUNGAH
24 SUGARLOAF RD
BEACONSFIELD UPPER 3808

IF, AS THE YAESU ADVERTISING says, the FT-1000 is the "best of the best", then the FT-990 must be a close second best. It has been said that the FT-990 is an FT-1000 less the dual-receive capability. That's not quite true. There are other differences, but in the main areas of handing and general performance, there is not much to choose. However, back to the beginning. The 990 is both smaller and lighter than the 1000. It achieves this in two ways. Firstly, there are less electronics to enclose, but more importantly, the inbuilt AC power supply is a lightweight switched-mode unit. With dimensions of 368 x 129 x 370mm, it is about three-quarters the size of the FT-1000, and at an all-up weight of 13kg, is just about half that of the FT-1000.

Naturally, the receiver tunes the full range from 100kHz to 30MHz with tuning steps of 10Hz. Two 10-bit direct digital synthesisers are provided to give both smooth click-free tuning and also to give fast transmit/receive switching for CW and digital modes. An automatic antenna tuner is included as a standard feature. This is a similar system to that used in the FT-1000, and it has its own microprocessor to control the 39 memories for quick antenna matching.

The transmitter, which covers all the amateur bands from 160 to 10 metres, has an output of 100 watts on SSB and CW and 25 watts output on AM for 100 per cent modulation. An RF speech processor is included for extra punch on DX contacts.

The receiver interference rejection department has some very interesting facilities. There is an IF notch filter, an IF shift and a digital audio filter with separate high and low frequency cut controls. I believe this is the first time this feature has been incorporated in an amateur transceiver. I will discuss the operation of this later. Selectivity is selectable from the front panel with a choice of 2.4kHz for normal SSB, 2kHz (with optional filter) for narrow SSB, 500Hz for normal CW reception, and a 250Hz position for the optional filter which is installed in the third (455kHz) IF. This is then in series with the 500Hz filter in the second IF for superior CW selectivity. Actually, the CW operator is very well catered for with features that include a built-in iambic keyer with dot/dash memory, a presettable BFO offset and a spotting button for exact tuning to zero beat. The key jack is on the front panel. First featured on the FT-1000, I believe these are the only two transceivers to have this facility. There is also a key jack on the back panel, if you prefer it. While on the subject of front panel jacks, I wonder when we might see a front panel 3.5mm audio output jack to connect to a cassette recorder. All current communication receivers have them, so why not have one on a transceiver? The only transceiver that does have one, to my knowledge, is a Yaesu, the FT-77. Pity that more transceivers don't have them. There is, I should mention, an RCA socket on the rear panel which does provide this facility, and it even has an internally adjustable output level. It would, however, be nice to see an output on the front panel.

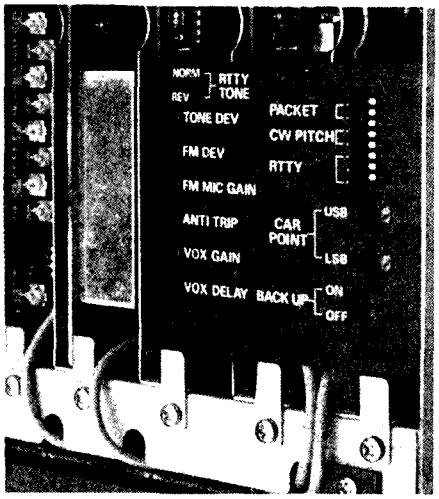
This front panel view of the FT-990 shows up the family resemblance to the FT-1000.

On the subject of recorders, the FT-990 does have provision for the installation of the Yaesu DVS-2 digital recorder. Unfortunately, this was not supplied with our review transceiver, so I must leave comment on it until some time later.

Tuning and band selection on the FT-990 have been very well thought out. To access any amateur band, press the appropriate "Band" button and there you are. Not only will this select the required band, it will also bring up the frequency that was last selected when that band was in use. If you require a particular frequency, then push "Enter" and enter the frequency via the key pad. The third method uses the up/down buttons. These change the frequency in 100kHz steps and, by keeping the button depressed, these go by at a very fast rate. If you need to shift frequency in large chunks, just press the "Fast" button and the up/down rate goes into high gear with one MHz steps.

While on the subject of tuning, the main tuning knob is the same size, and has the same silky smoothness as the one on the FT-1000. The tuning rate is normally 10kHz per knob revolution for SSB and CW, and 100kHz per revolution for AM, FM and packet FM. Again, with the "Fast" button activated, the tuning rate is increased 10 times. As if this is not enough, the tuning rate for any mode can be halved from normal by soldering an internal jumper connection. This is clearly described in the owner's manual.

The receiver and transmit clarifier controls deserve special mention. They are of the type found only on the top class transceivers. That is, there is a total range of plus or minus 9.9kHz. The re-



Here are the "top hatch" controls described in the text.

quired offset can be pre-selected just by turning the clarifier knob, and then brought into use with a push of the "RX" or "TX" button. Push "Clear" and it all resets to zero. All very nice and smooth to operate. Both the main tuning and clarifier readouts indicate to 10Hz, but if for some reason you prefer 100Hz readout, this can be selected with one of the "Switch On" functions. Naturally there are two VFOs, and they can be selected in any combination to provide split operation or two-band operation by selecting either.

The FT-990 on the Air

Plug it in, connect the antenna, and we are ready to go. Push the "Power" button to the "On" position, and ..... nothing; well, not for about two seconds anyhow. I am not sure why; I guess the switch mode power supply has a built-in delay. Once you are used to it, there is no problem. The meter and display illumination is bright and clear. No doubt about it, a good analogue meter really takes a lot of beating. If you prefer a bit less brightness, just hold down the "Fast" button and turn the "Clear" knob, setting the brightness to suit.

While in the initial stages of operation, it's a good time to look at the various "Power Up" options. First off, just for fun or to impress your family and non-technical friends, try the "Las Vegas" diagnostic test of the display and its microprocessor. Press and hold down the 1.5 and 7MHz band buttons while switching the power on. This produces the most amazing effect of all display functions cycling through their functions with, finally, the word "YAESU", followed by the ROM version number displayed. After a couple of seconds, the display returns to normal.

Pressing the 29MHz band button while switching the power on returns the display to 100Hz resolution.

Pressing the 10, 14 and 18MHz band buttons together (three fingers needed) while switching the power on toggles the manner in which the displayed frequency is effected when changing modes. In the default state, switching to and from CW, packet and PKT/RTTY causes the display to change by the amount of offset selected by the CW pitch and PKT/RTTY DIP switches in the top access hatch. After the change, the display will continue showing the same frequency when switching to and from these modes.

While on the subject of the top hatch, there are some very interesting controls hidden up there. Two interesting controls not seen before on amateur equipment are the USB and LSB carrier switches that allow the carrier insertion point to be moved up or down in 20Hz steps. They in fact allow the operator to select the audio response balance to suit his particular requirements.

FM deviation and microphone gain controls as well as tone deviation for the 88.5Hz sub-audible tone for operation into some 10m FM repeaters are located there.

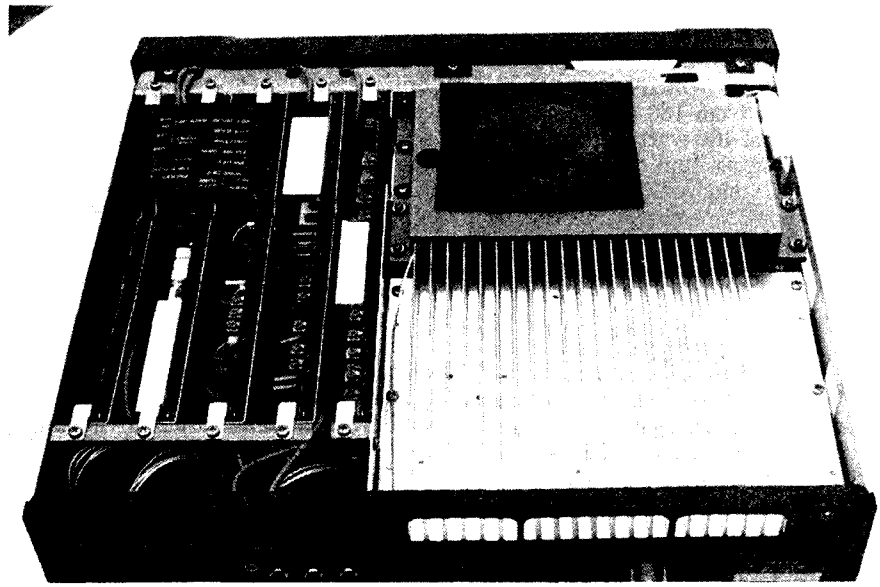
A group of DIP switches allows adjustment of firstly packet FSK tone, the CW tone and, finally, the shift for RTTY transmission. A slide switch allows the mark and space to be reversed for RTTY transmission.

Well, let's have a listen around the bands and see how things sound. The smoothness of the tuning control was quickly appreciated, and the bright amber frequency readout seemed slightly larger than usual, and certainly very legible. First impression of the received quality of SSB signals was that they sounded a bit on the muffled side.

So, up with the top hatch and quick adjustment was made to the USB/LSB carrier points. I switched both to the point of least bass response and tried again. This time it was better, but I still felt it lacked high frequency response. However, the audio was very clean and helped to a large extent by a very good AGC system. The switchable AGC offers four options: off, fast, slow and auto. The auto position gives slow for SSB, and fast for AM reception. I must admit I tended to leave it in the slow position most of the time. Overall, the AGC action is excellent, with no pumping and a very well controlled decay.

The tuning knob would have to rate as one of the smoothest in the business, and it has one thing the others don't have - a finger hole. With the fast button held down, the tuning rate steps up from 10Hz steps to 100Hz steps. This is most useful as it is still a tuning rate as distinct from a stepping rate. You can still tune SSB quite satisfactorily and then go back to the 10Hz rate for fine tuning. Many transceivers go to a 1kHz fast tuning step which is, of course, too broad to resolve SSB and, in most cases, too fast for even AM tuning.

While on the subject of AM, I consider the quality of AM reception is far too bassy. No doubt the AM selectivity is rather tight, but it seems there might be quite a bit of top cut in the audio end of the receiver. It sounds as if the tone control is on full top cut, but unfortunately



Top view of the transceiver with the covers removed. Note the massive heat sink and the plug-in boards on the left.

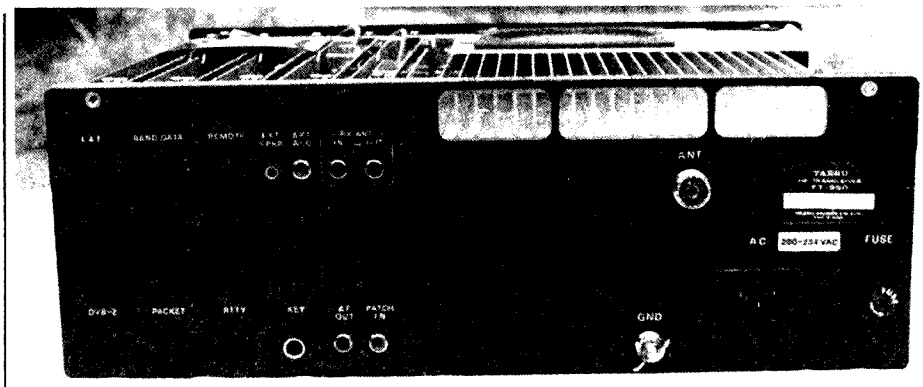
there is no tone control. This might be why even SSB sounds a bit bottom heavy. In the QRM reduction department, there are three weapons to bring out. The IF shifts, the notch filter and the digital filter. Firstly, the IF shift works very well. It's no better and no worse than any other IF shift, but still a very handy thing to have. Unfortunately our review transceiver did not have the optional 2kHz filter fitted for me to check its action with the IF shift. Generally the shift works better with a narrower filter. The notch filter is of the IF type, in other words it works at the IF frequency and not at audio frequencies as some do. Most IF type notch filters are effective in removing an interfering hetrodyne, but often, in doing so, remove a lot of the wanted signal as well. In this regard, the 900 filter is better than many, but still suffers from the problem to some extent. Perhaps it's time that manufacturers considered putting in two notch filters, one at the IF frequency and one at the audio end.

Now to the amazing digital filter. When I first saw the FT-990, I guessed (incorrectly) that this device was in fact a shift/width or SSB slope tune control. Well, it is and it isn't. It is actually a sharply tuned top-cut filter (tone control if you like) and a sharply tuned low-cut filter. The steepness of the cut at both ends is really quite amazing. In use, it has an effect similar to the IF slope tune found on, say, my old TS-930 transceiver. It certainly sharpens up the apparent selectivity to a remarkable degree and, in fact, most of the action takes place in the first half of the knob rotation. From there on, there isn't much left to cut. Used in conjunction with the IF shift, it can do a very good job of removing QRM. But, like all audio devices, it cannot remove a strong interfering signal from the actual pass band. So, is it worthwhile? No doubt about it - yes! But, would I swap it for a good slope tune system? No way. Where it does shine is on CW where, with careful adjustment, you can get a single signal effect.

Last, but by no means least on the receive side, is the memory system. There are 90 memories to play with. You can enter frequency, mode, bandwidth and repeater offset into the memory. One of the nice features is the automatic repeater offset for 10m FM repeaters. Overall, the memory system is very easy to use.

The FT-990 on transmit

The 990 has a nominal power output of 100 watts, and not 200 as does the FT-1000. However, this is not to be considered in any way a disadvantage. This puts it in the same class as most other transceivers. Dick Smith kindly supplied an MD-1 desk microphone to use with the 990 and reports on this were first class. The RF speech processor is of a brand new design. It incorporates a frequency shift facility (FSP) which allows the operator to set the audio frequency response to "customise" his signal.



Rear panel of the FT-990. All connections are easy to get at.

The filter band pass is actually shifted relative to the carrier to increase or decrease the low frequency cut-off point.

To set this, just press and hold the "Fast" and "RF FSP" buttons and turn the tuning control until the display shows the required offset. This indicates from -0.3 to +0.5, giving a total variation of 800Hz.

Setting this to suit your voice, plus a few dB of processing, produces an outstanding SSB signal.

I also tried it with a standard Yaesu hand microphone and found that reports were also good, but not up to the MD-1.

Metering on transmit is very comprehensive. You have the choice of the following: RF power output, PA collector current, SWR, RF speech compressor level, ALC and final amplifier collector voltage. The meter illumination and calibration are excellent. CW keying was found to be clean and free from clicks.

The FT-990 Accessories and Options

A good selection of plugs is supplied with the FT-990. A four-pin, a five-pin and an eight-pin DIN plug allow most external connection to be made. Two RCA plugs, a quarter-inch TRS plug for CW key connection and a 3.5mm plug for external speaker connection are also packed with the transceiver.

An AC power connector fitted with an IEC socket and a selection of spare fuses are also provided.

In the options department, you can choose the TCXO-2 high stability Master Reference Oscillator and the MD-1C8 desk microphone which we will be looking at in a separate mini review very shortly. A high quality external speaker, the SP-6 features switchable audio filters.

Two optional filters, one for CW with 250Hz bandwidth, and an eight-pole 2kHz narrow SSB unit, are both available.

If you want to control the FT-990 from your personal computer, then you might consider the FIF-232C interface unit. All in all, enough to satisfy the most critical operator.

The FT-990 Instruction Manual

The instruction manual is well presented. Its overall quality is not quite up to the FT-1000 manual, and there are one or two errors. For instance, the quarter-inch TRS key plug is labelled as a half-inch plug, and the 3.5mm external speaker plug is identified as a quarter-inch plug. However, overall the book is well written and very clearly illustrated, and there is plenty of information on the CAT system computer control, with a full page of CAT commands.

Again, as with the FT-1000, I regret that a full technical description of the rig is not included. Yaesu is using new techniques in the 990 and it should tell us how they work. Again, as with the FT-1000, I hope a workshop manual might be soon available. If and when this occurs, I will be happy to make this the subject of a mini review.

The FT-990 Conclusions

The performance and operation of the 990 are very good. I would prefer to have the "Shift/Width" control of the FT-1000 over the "High/Low" digital filter, but in all other respects the 990 is a delight to use. The built-in lightweight AC power supply also puts it in front of other medium priced transceivers.

Our review transceiver was kindly supplied to us by Dick Smith Electronics, to which all enquiries should be directed.

The FT-990 will retail for $3295, which includes a bonus MD-1C8 desk microphone. **ar**

Parkes Radio Telescope - 30 Years of Discovery

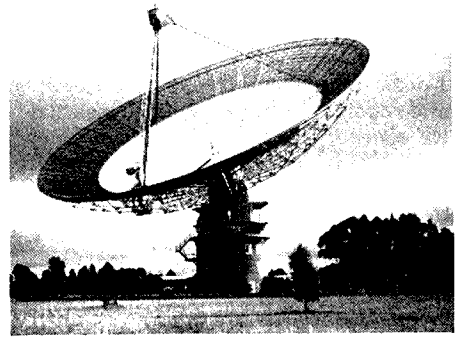
BY IAN MCGOVERN AND ALAN E WRIGHT VK2JOY
PO BOX 276
PARKES 2870

THE CENTRAL-WEST OF NEW South Wales in Australia is an area both of beauty and stark contrasts. He we may suffer scorching-hot, arid summer days - or impassable floods following on torrential rains. Here we see magnificent, deep-orange sunsets fading into the black velvet of crystal-clear night skies. And here, amid thousands of hectares of wheat fields and rich sheep-grazing land, we find the largest fully steerable radio telescope in the southern hemisphere.

The Parkes 64m dish is one of Australia's - and the world's - premier research instruments. Since 31 October 1961 the telescope has remained at the forefront of astronomy, conducting pioneering research into such fields as the structure of our galaxy, the discovery of quasars and the elucidation of the enigmatic pulsars. This year astronomers everywhere will be celebrating the 30th birthday of the commissioning of one of the most versatile and productive astronomical instruments ever built.

Any telescope is conceived against a background of the then-current astronomical problems. The giant Parkes dish was no exception. In the mid-1950s, radio astronomy was in its infancy: the quantity and distribution of hydrogen gas in our own, and other, galaxies were unknown; few continuum surveys of the whole sky had been made, and those which had been made were in conflict; it was believed that atoms and molecules other than hydrogen would have detectable spectral line emissions - but none had been found; and the nature of the source of energy in the few extra-galactic radio sources so far discovered was a complete mystery.

It was clear at the time to Australian radio astronomers that a sensitive and versatile radiotelescope, capable of tackling these problems, was urgently needed. To "Taffy" Bowen, then head of the CSIRO's Division of Radiophysics, it was equally clear that the instrument had to be a giant parabolic reflector telescope. Important input into the design of the new instrument came from Barnes Wallis (of Dam-Buster bomb fame). Partial funding was provided by the Carnegie and Rockefeller foundations of the USA and, to cut a long, traumatic and fascinating story short, the Parkes radiotelescope came into operation in 1961.



The Parkes Radio Telescope

From then until the present day it was to achieve everything - and much more - that its designers had envisaged. Just a few of the highlights have been: the identification of the first quasar, 3C273, in 1961, and the subsequent discovery of more of these extraordinary objects than any other radio telescope; the whole of the southern skies has been systematically surveyed twice for new radio sources and their optical counterparts identified; and the telescope has played a leading role in the *Apollo* and *Voyager* space missions with the world seeing that *"first small step for mankind"* on the moon relayed via the Parkes dish.

In January 1986, two major events occurred. For the first time since the Apollo moon missions, the Parkes telescope tracked two space probes. The European Space Agency (ESA) launched the Giotto satellite into the infamous Halley's Comet, bringing back absolutely stunning results. Also in that year the *Voyager 2* deep space probe visited the planet Uranus and its moon Miranda. Then, three years later in 1989, the Parkes antenna provided a vital downlink for *Voyager 2* as it encountered one of the most distant planets in our solar system, Neptune and its moon Triton.

As it moves into its fourth decade, the Parkes dish has been assimilated into a larger entity, the *Australian Telescope National Facility*. As well as Parkes, the Australia Telescope consists of five 22m dishes located 300km to the north of Parkes, and a single 22m dish near Siding Spring Mountain, the home of the Anglo-Australian Optical Telescope. From time to time, this massive synthesis array of dishes will include the NASA Tidbinbilla 70m dish near Canberra, and a 26m dish in Hobart belonging to the University of Tasmania.

Footnote: The Parkes Radio Telescope will hold an open day on Sunday 6 and Mon 7 October to celebrate its 30th birthday. Between the hours of 9am-4pm there will be many activities including the opportunity to go through the telescope itself. One of the many special events planned will be a display by the Parkes Amateur Radio Club. There will be displays of the old and the new, from vintage radios to packet radio. With many thanks to the Department of Transport & Communications, the exhibit will operate with a special callsign, VK2BRT (Big Radio Telescope). Listen for this callsign on the two days as it could come up on any band at any time. One hundred contacts made over the two days will have the opportunity to receive a very special limited edition QSL card.

If you would like more information on radio astronomy or the open days, write to: Ian McGovern, CSIRO Visitors' Centre, Australia Telescope Parkes, PO Box 276 Parkes NSW 2870. Or phone (068) 62 3677, fax (068) 62 3341. ar

Murphy's Corner - Errata

We managed to mix up some callsigns in the September issue. Robert McGregor, author of *The Three-Coil Trick*, was described as VK3XS instead of his proper call, VK3XZ. To make matters worse, the synopsis given to the Divisional broadcasts was also incorrect. Chris Peake VK3CXP, author of the "Over to You" letter "CB and Amateur Radio" had his call corrupted to 3XCP.

Apologies to both gentlemen for the errors.

Darwin Amateur Radio Club Incorporated VK8DA

SILVER ANNIVERSARY

THIS IS A CONDENSED HISTORY OF THE PAST 25 YEARS OF THE DARWIN AMATEUR RADIO CLUB INCORPORATED, WRITTEN BY HENRY ANDERSSON VK8HA, 1ST HON LIFE MEMBER OF THE CLUB.

The first meeting of the then Darwin Radio Club was held on 7 November 1966.

In those days there were not many resident amateurs in Darwin, so the amateur population consisted mainly of public servants from other states visiting for a three-year term of duty. Some stayed longer than their initial term, whilst others liked what they saw and are still in Darwin and rural areas. They were a very enthusiastic and helpful group to their fellow amateurs and intending amateurs, contributing to the start of the club and leading on to VK8DA, the club station, and VK8VF, the 144MHz beacon.

Membership of the club always seems to vary between 25 members and 50, but rarely does the membership climb to more than 50.

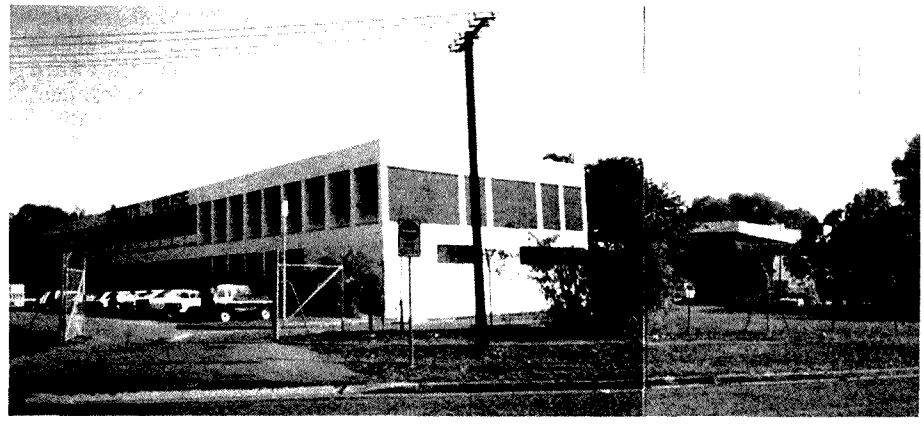
Club premises and meeting places have always posed a problem, and initially meetings were held in private homes; however, over the years the meeting place has graduated to various educational establishments in the Darwin and suburban areas.

After securing a building on the East Point Reserve, the club's dry season meetings were held in the open, outside the club bunker.

The first General Meeting of the club, the 46th to be held on East Point premises, was on 3 August 1970. As this day was a public holiday, no business was transacted, instead antennas were erected at East Point and VK8DA was operated on air.

From March 1972, the club obtained the use of the Civil Defence Headquarters on the corner of Stuart Highway and Parap Road and, in return, it was agreed that all club members should join the Civil Defence and also assist with radio communications in emergencies. Club members were also to participate in civil defence and emergency exercises which were held approximately three times per year. The club also had the use of the Civil Defence Base Station transceiver (ex-amateur band transceiver) for airing of VK8DA.

During October 1972 VK8VF was operated on a test basis. During the same month the club name was changed from



Darwin Radio Club to Darwin Amateur Radio Club, and in November 1972 the new 52MHz beacon was handed over by Peter VK8ZKA for continuous operation.

The Civil Defence Headquarters was used as a meeting place until it "flew away" on Christmas Day 1974.

The 99th meeting to be held on 6 January 1975 had to be cancelled, as only one member attended. The 100th meeting was held on 1 February 1975, with member VK8s KK, ZCF, HA, ZTW, CM, ZRD, ZCW, ZCJ and Terry Hine, now VK8TA, in attendance. Apologies were received from VK8s BB, AZ, KS, CEG, ZBQ, OI and members evacuated from Darwin. A good time was had by members and visitors, with much discussion about how each spent the early hours of Christmas Day 1974.

From August 1975 the club had the use of the Civil Defence Bunker at the new address of the Civil Defence/Emergency Service Headquarters in Bishop Street. This bunker was cyclone and bomb proof, but was very damp as it was underground. It also had a standby power plant which was very useful during reconstruction of power lines after Tracey.

In February 1978 the club obtained the use of the Casuarina High School for meetings, as the Civil Defence required the bunker for its own activities. About the same time the club was offered a one-hectare block of land in the Berrimah area. However, it was impossible to accept this offer due to the cost of a club building, fencing, sewer, electricity and improvements to the block, although the club did apply for a grant from the Northern Territory Government, but was unsuccessful.

In 1979 East Point Club House was restored and, in September 1979, Mr Dondas, the then Development Minister, officially opened VK8DA.

During the opening, members demonstrated their ability to make contact with almost any part of the world at any time, by using different frequency bands.

Contacts were made with the president of the SA Division of the WIA, many club members who had left Darwin after Tracey, most states of Australia and many overseas countries.

During 1982-83 the Department of Health Stores at Fannie Bay became vacant. Many sporting clubs obtained use of the building, and our club applied for a portion of the building to use as a meeting place, lecture room, home for VK8DA etc. After much correspondence with the appropriate authorities, a room was granted.

Various working bees were organised to paint the room and to clean up the club's portion of the garden. A 144MHz band Slim Jim was erected, and an application for the erection of an HF wind-up tower is in the pipeline.

At the end of 1984, the VHF beacons, and the relay of the VK5WI Sunday morning broadcast, had been transferred to Fannie Bay. A small AM transmitter had been purchased from the Department of Aviation in Darwin and used for the 3.555MHz VK5WI relay.

The new home for the club was officially

opened by Mr Dondas on 24 November 1984.

Amateur radio classes for beginners are conducted at Fannie Bay, and Morse code lessons are transmitted by VK8HA on 3.555 and 146.6MHz almost daily at 1000 UTC. C90 cassette tapes are available from Henry VK8HA, with Morse speeds up to about 20wpm, for the exchange of a clean C90 cassette tape.

In early 1983 Bill VK8ZWM and a group of RTTY enthusiasts formed a RTTY group called "Territory Amateur Radio Teleprinter Society". This group records the VK2TTY Sunday morning broadcast, and an edited version with local news added, is rebroadcast by VK8HA at 1000 UTC on 3.555 and 146.6MHz on Sunday evenings. TARTS callsign VK8TTY is used for the broadcast and other RTTY activities.

VK8DA has nets on Sunday mornings after the broadcasts on 3.555 and 146.5MHz and VK8TTY on Sunday evenings after the RTTY broadcast on 3.555 and 146.6MHz.

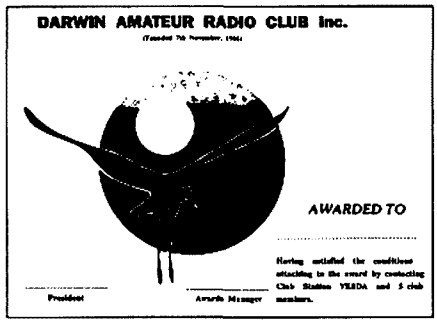
VK8DA Issues Two Awards for Amateurs

Top End Award is available to all VK stations who work 15 members of the club and one contact with VK8DA or VK8TTY ... SWLs who hear 10 club members and VK8DA or VK8TTY ... Any band, any mode.

Applications to Henry VK8HA, Box 619, Humpty Doo, NT 0836, and include $3.00.

Bougainvillea Award is issued free to all amateurs and SWLs visiting Darwin during the festival which normally coincides with the Northern Territory Self-Government Celebrations on 1 July each year. The requirement for this award is to work/hear/eyeball 10 members/amateurs in Darwin during the festival and to see Henry VK8HA to collect the award at Trippe Rd, Humpty Doo, 2.5km past the Humpty Doo Hilton on the Arnhem Highway.

The services of the club have been augmented by a packet bulletin board



under the call of VK8DA on the following frequencies: 14107kHz LSB 300Bd, and 144950kHz FM 200Bd.

Apart from repeater VK8RTE on 147000kHz, the club has installed a new repeater on the Marakai Building in Darwin City. Callsign is VK8RDA, and it operates on 146700kHz.

The club will be celebrating its silver anniversary on 7 October 1991. An award will be issued to amateurs during the period October and November 1991, and is called the Silver Anniversary Award. Requirements for this aware are to work/hear VK8DA and five members of the club during this period.

Cost is $5, and applications to Awards Manager, Henry VK8HA, Box 619, Humpty Doo, NT 0836.

The club will be arranging a dinner on 9 November 1991 for the celebrations, and also some bus trips to famous spots around Darwin. There will be a cruise on the harbour on board the m/v "Sturm Vogel" (VK8LR/MM) if weather permits.

Anyone in Australia, and maybe DX, who wishes to attend any of these functions can contact any of the three foundation/honorary life members still in Darwin, namely: VK8HA, 88 2450, VK8TA, 81 5516, VK8DI, 85 1068 AH and 89 7622 BH. You can also contact the Secretary, Frank VK8FT on 27 6275. ar

Amateur Radio and Emergencies

LEIGH BAKER VK3TP
(FEDERAL WICEN CO-ORDINATOR)
552 CANTERBURY RD VERMONT 3133

FROM THE 1920S AMATEUR radio operators have been well known through the press for their assistance to people and communities that are going through emergencies. Many distress calls from ships have been intercepted and passed to the authorities for action. In times like Cyclone Tracy the only external communications are again by amateur operators. The reasons that we are "on the spot" and are able to assist are very simple.

While the public is well aware that local amateurs have the ability to, and regularly do, talk to amateurs in other countries, most are not aware that there are well organised voice repeater and data repeater networks that cover all of our populated areas as well as a lot of our sparsely populated country. Amateurs may live in isolated areas, but they are never isolated.

There are some 17,000 persons who are licensed as amateurs by the Department of Transport and Communications and they are spread right across Australia. Because these people are familiar with the theory of radio and its application, in times of emergency like Cyclone Tracy, they can very quickly repair damage to their systems and become operational again. Those people who live in isolated communities are well aware of the need for reliable communications, and groups like the SES are well aware of those amateurs who live in their areas. WICEN is a group of amateurs who work with or in support of the emergency services as and when required. In the north of Australia, a group of amateurs belonging to WICEN provide a regular "weather watch" for the SES for coastal towns and marine use. Other amateur groups provide an Australia-wide "marine watch" for yachts and other non-commercial shipping. Yet another group has been set up to send health and welfare traffic for the general public in times of emergency. Radio amateurs have been assisting their communities in these ways during emergencies since the early 1920s.

Most of these groups form part of the community service arms of the Wireless Institute of Australia (WIA) which was set up to represent the interests of the amateur operators in this country. There are also some 120 affiliated radio clubs, together with numerous allied interests throughout the country.

WICEN is just one of the "community service" parts of amateur radio, and its objective is to make the resources of the amateur radio service most effectively available to the community in times of disaster or sudden need.

A Federal WICEN Co-ordinator is appointed by the Federal Convention of the Wireless Institute of Australia. He acts as a focal point of contact and co-ordination between the State Co-ordinators and the Natural Disasters Organisation (NDO) and co-ordinates any amateur communication facilities required on a national scale for disaster purposes. WICEN operators offer the disaster control authorities various communications modes, with an equally wide range of sophisticated equipment, and the trained manpower to operate the facilities and, if required, competent relief personnel for the authorities' own communications terminals - all at little or no cost to the authorities, the government or the general community.

The trained operator core of WICEN is available on request by the appropriate authorities and, in the case of a larger emergency, would act as a nucleus to enable the rest of the amateur radio population to be put to use.

From the amateur viewpoint, participation in WICEN training and exercises is a preparation for the time when the amateur can offer a unique service to the public during a time of need, and hence put something back into a hobby which is capable of offering so much in return. It must be remembered, however, that the emergency services which will call on amateurs for assistance, such as the police, ambulance, Red Cross, Health Department of the State Emergency Services, are professionals involved in the preservation of life and property, and hence assistance which is unco-ordinated or untrained in the special requirements of these services is not acceptable.

Accordingly, the WICEN organisation provides the necessary liaison and training so that the assistance that is given is a reliable communications facility capable of working in conjunction with the emergency services.

At this time better than one in 16 licensed amateurs in Australia belong to WICEN. While this may seem a large number, senior representatives are concerned that this membership is too city-based and that WICEN needs to involve more amateurs who live in country towns and in the more isolated parts of this country.

If you can assist or are just interested, please contact your divisional WICEN co-ordinator through the WIA, or join in one of the WICEN broadcasts. It does not matter what level of licence you have or what equipment you have or where you live... we need YOU. Further information can also be obtained from the WICEN phone BBS on (03) 802 0913. **ar**

TRY THIS

Dummy Load Would Soothe My Ears

J.G. Muller VK3LU
23 Loch Ave, Ballarat 3350

MORE AND MORE AMATEURS are acquiring linears and operating without upgrading their dummy loads. The results can be heard every day of the week, specially it seems when I am trying to work some rare DX.

A cheap, easily constructed and satisfying way of reducing the incidence of this interference is to home brew your own dummy load. I used an old method that first appeared in *73* magazine of May 1978.

The load is purely resistive at 50 ohms and will dissipate 400 watts of RF comfortably.

Parts required:

4 litre can (I use an old mineral turpentine tin)
2 3" x 3" x $^1/_{16}$th brass plates
10 470 ohm 5 watt resistors
1 female coax connector to take PL259 (flanged)
4 strips copper braid 4" to 5" long
4 litres 20/40 engine oil
The cost is less than $20.

Method of Construction

Using a can opener that cuts up the side of the can, remove the bottom of the can. This makes it easier to solder back on later.

Drill the brass plates with nine holes 40 degrees apart in a two-inch circle, with the 10th hole in the centre (see figure 3). Insert the resistors upright in the holes between the plates and solder.

Solder the four pieces of copper braid to the corners of the bottom brass plate. I used braid from coax.

Solder a heavy-gauge piece of copper wire to the centre of the top plate, leaving 2" of wire upright to be soldered to the coax connector.

Punch a hole in the top of the can to take the coax connector. Put the resistor network inside the can and push the 2" of wire through coax connector hole and solder to the connector. Then solder the flange of the connector to the can, sealing if completely (see figure 2).

With the resistor network hanging down 2" in the can, solder the four lengths of copper braid to the inside of the can. This holds the network in place and provides a ground plane effect (see figure 1).

Solder the bottom of the can back on and fill with the oil and, hey presto, you have a dummy load that works,

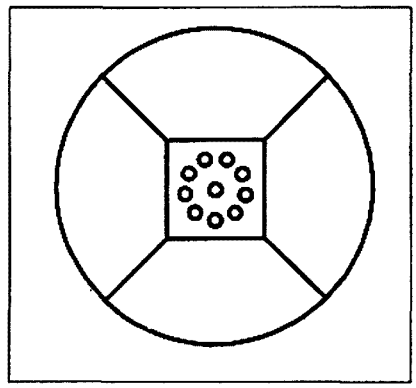


Figure 1: Inside of the can from the bottom.

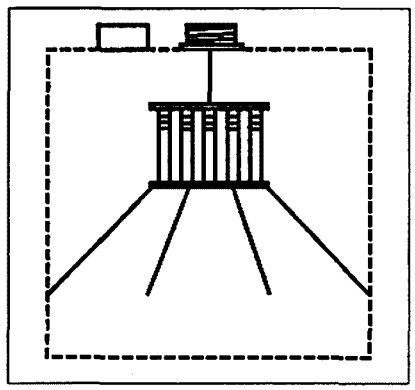


Figure 2: Resistor Network inside can.

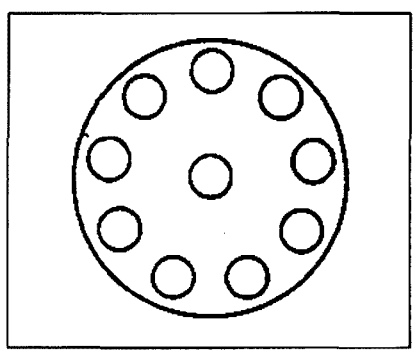


Figure 3: Brass plates after drilling

and a grateful ham community.

When in use, either loosen the cap of the can or drill a hole in it to lessen pressure of gas build-up.

Technical Editor's Note: The resistors used must be non-inductive, ie not wirewound. Particular care should be taken with soldering the bottom of the can to avoid leaks. **ar**

How Much it Costs to go on a DXpedition

The proposed budget of the Myanmar (Burma) DXpedition contains the following interesting amounts and items (all in US currency): generators and fuel, $3270; yacht charter, $13,300 for three weeks; two second-hand jeeps and fuel $13,400; security equipment and weapons(!), $4800. For for six personnel has been budgeted at only $10 each per day (approximately $1420) plus, of course, the airfares from and back to Russia for Romeo and other operators.

Stephen Pall VK2PS

ar

70 Years in Radio

FRANK PATRICK VK3FJP
(SUBMITTED BY Q FOSTER L30720)

IN 1920, THE MARCONI SCHOOL of wireless was a small single-storey building in 424 Little Collins St. Lionel Hooke was in charge and Joe Williams was assistant instructor. The exam was held four times per year. The minimum age to sit was 18 years. As there was little radio equipment in the school, the student was taken to any ship in port and tested on the ship's set. A few faults were made on the set, such as a bit of paper under a contactor, a couple of wires loosened, and the rookie was supposed to find them. That was the final test and, having been successful, he became the proud owner of a First Class Certificate of Proficiency in Radio Telegraphy under the London Convention.

At that time only two types of transmitters were on use on the Australian coast. The Marconi 1.5kW rotary asynchronous gap or the Telefunken 2.5kW quenched gap. The latter were mainly in ships that had been taken over from Germany after the 14/18 war. Compared to nowadays, the sets were large and heavy. All ships used a "cat's whisker" crystal receiver. The working range of these sets was about 200 miles during daylight hours. All operators in port used to go and sign an appearance book about 9.30am. They were then clear for the rest of the day. Generally, all would then retire to the "local" for a cool glass of morning tea. There, many tales were told of the long distances they had worked: Frisco, VIM or VIP. For some reason, the longer the session lasted, the greater the distances grew! Galena was the favourite crystal receiver material, and operators would carry their favourite crystal with them in their fob pockets.

In the early '20s the valve was being developed. The first Australian valve used was a glass tube about three inches long with two filaments. The elements had a wire coming out each end and these were connected to the set. If a filament burnt out, it was a simple matter to switch to the other set of filaments. Later the four-pin type came into use. AWA developed a valve receiver called the "P1", using a single valve, and installed them on their ships' gear. Also at this time was the type "F" transmitter, a half-kilowatt. The HF beam wireless for international traffic was in operation by the late '20s. Stations were built at Ballan and Rockbank for this system. Melbourne Radio was set in the Botanical Gardens of Domain Rd.

Frank Patrick VK3FJP during Air Force days

In 1928, when Charles Ulm and Kingsford Smith flew the Pacific in the "Southern Cross" (KHAB), I kept a watch on the frequency. Ulm kept the key screwed down, and every 15 minutes he would open the key and send his report and then close the key again. His CW note came through clearly. Radio was now no longer a novelty.

In 1924, police radio D24 was commenced. Two cars were fitted with radio, and each carried a qualified operator who kept a watch with VIM. When D24 got a call, it would ring VIM to tell the car to ring D24. Later, D24 installed its own transmitters. Ships over a certain tonnage had to carry an operator. Overseas traders had to carry three men, working four hours on and eight hours off. In the European and Atlantic waters, the SOS call was not uncommon. I copied my first SOS one morning. The ship was rolling heavily, waiting for the sea to abate to let us into Alexandria Port. We had just come through the Suez Canal where the "Gillie boys" had come selling Turkish Delight, sickly sweet jelly like jubes. I had eaten a lot, and with the ship loaded with a cargo of bulk wheat for Egypt - not the best of cargoes at any time, when the ship will roll the milk out of the tea.

I was sitting with a bucket between my knees, hoping the ship would sink and end my misery. It was my first bout of mal de mer. That Turkish Delight was lovely going down but coming up it was shocking. Suddenly Alexandria sent QRT SOS. His signal was QSA 10 plus. Never had anyone dying of sea-sickness ever recovered so quickly. As per regulations, I went and woke the senior operator. To my surprise, he did not seem to be very impressed and said 'She'll be okay, its probably a thousand miles off', and went back to sleep. He was right, as the ship was in the North Sea. When an SOS is sent, the nearest station takes charge. He will send out QRT SOS. The other stations will repeat the signal until all traffic is shut down till the emergency is cleared. In this way it had come down through the French, Spanish, Italian stations to Egypt. All 600m traffic has to cease operations at 15-18 and 45-48 minutes past the hour GMT. Any ship, except in an emergency, that breaks that regulation incurs the wrath of all coast stations that heard him. This rule has been in for 70 years and is known as the Silence period.

In 1923, radio station 2LO was operating from the top of the Savoy Hotel in London, it was a real novelty to we Colonials. The senior operator on my ship had got some radio bits and had built a set to hear this new fangled stuff. When we were passing Gibraltar he called out to come and hear London. We crowded round when a voice said "This is Gibraltar testing". It really got us in, and as radio parts were very cheap in Antwerp, we all got bits and pieces to build a set. Valves were three shillings each, other parts similarly priced.

In Victoria 3AR and 3LO used to broadcast on different wavelengths than now. It was decided to use the present frequencies. A test was arranged and after the night session had ended, the station would come up near the present frequency. I was sent to Bacchus Marsh to report on the transmissions. I had a three-valve set and rigged a bit of an aerial out of the hotel room where I was staying. Reception was excellent. As the publican was a keen racing man, I invited him up to my room to hear Eric Welch (I think) call the race. I think the old gentleman had an idea it was a joke, but decided to humour me anyway and came up. I had tuned the set into 3LO, showed him how to put the phones on and tuned

on the set. They were lining up and, finally, there were off. He sat with the phones pressed to his ears. After the race, he said, "It's ### marvellous; come and have a drink." Not wishing to offend him, I went down to the bar. He was really excited and said to his clientele in the bar, "I just heard the races; I could see the horses; come on boys, have one on the house." According to the locals, that Saturday afternoon was a red-letter day - the first time anyone had seen a race from there and the first time he had ever shouted them all a drink.

Between 1930 and 1940 radio advanced very quickly and became an accepted necessity. Aviation had become dependent on radio for in-flight information and safety. Aeradio stations had opened on all routes; these were equipped to cover all flights and most were equipped with direction finding sets, either the Marconi Adcock or the Bellini-Tosi. These were very accurate when conditions were okay. Three classes of bearings were sent. 'A' class was accurate to one degree, 'B' class three degrees and 'C' was five degrees, but was not accepted except as an indication. With a bearing from two stations, the pilot could confirm his position. Later, the NDB (non-directional beacon) came into action, and this allowed the pilot to get his own bearing. In the early '30s the radio range came into operation. A narrow beam was sent along the route. The pilot locked onto this beam and when on course got a steady signal. If he deflected to port, he was warned by a series of dots and dashes; if he drifted to starboard he got a different set of signals *(A one side, N the other - Ed)*. These have been superseded by the DME sets. The pilot can now get his position by a flick of a switch. The old days of "by guess and by God" are gone forever

The Royal Flying Doctor Service handles a lot of traffic in the outback. Alice Springs had a teletype line to the Adelaide GPO, and handled all the land line traffic to the outlying stations by radio fone. For years, they carried on the "School of the Air" for the outstation children. Also, the CWA used to hold its meetings by radio. The president would put the motion to the meeting and it would be seconded by a member 500 miles away and would be carried by all the members, some of whom would be hundreds of miles apart. The hospital and base could be alerted by the stations using "SELCALL". Alice Springs would have up to 40 telegrams per day to distribute.

In 1975 I did my last trip at sea as relieving operator on a Greek tanker to New Zealand. Fifty-eight-thousand tons, 19 knots, and a crew of 24. The engineer sat in an office and watched the indicators. If any part of the machinery malfunctioned an alarm would be activated. No more walking round with an oil can in hand feeling bearings for overheating etc. The engine revs were controlled by a console on the bridge. Weather fax, radar screens, ship to shore R/T all on the bridge. En suite in the radio operator's cabin and a feather bed! These here young blokes don't know what a seaman was like in them days. So, think we old gaffers. No more passing the time signal at noon by hitting the bridge floor with a hammer from the radio cabin. The mate on the bridge presses a switch and receives his ZP (position via satellite) and can pinpoint his exact position.

To watch the satellite equipment at Healesville makes one realise the almost unbelievable advances in 70 years in radio. Two television programs are being received simultaneously on one machine; they are separated and two television screens are each receiving perfect TV programs. These were being sent to a Sydney network.

As a young innocent lad I was fascinated by the account of the "Titanic" shipping disaster in 1912 when she went down with hundreds of passengers. The radio officer went down with the ship trying to contact other vessels. There was a ship (the "Carpathia") only 30 miles away, but the watch was closed as ships then only carried one operator. Had he been on duty, he would have heard the distress call. In those days, "CQD" was used; "SOS" came later, as it was more easily distinguishable. What a different story might have been told. An auto alarm was developed and fitted to sea-going radios. Twelve four-second dashes separated by a one-second pause would be sent. Three dashes would activate an alarm in the officers' cabin and on the bridge. Before closing down for the night, the auto would be tested and turned on.

Few remember the big superhet radio receivers that were very popular in the late '20s, the Reinartz, the old web coils and several other circuits that the young lads used to build and boast about. McElroys was up in Swanston St and was the first radio shop to sell all sorts of "the latest" in radio. Friday night and Saturday morning was always a very busy time for those men behind the counter. Radiola, Astor, Atwater-Kent, Mullard and Crossley were some sets the older hams may remember. Sets retailed from 20 pounds for mantel models, to 40 pounds for a good cabinet set. Some of these old timers are still going.

In 1991, the radio officer ends his seagoing career as no ops will be carried. Computers, radio technical advances are responsible. At one time, there were weekly services (passenger) from ports around Australia. There were dozens of freighters trading round all ports. All are gone today. All carried a radio officer. The amateur will soon be the only ones using CW. It is hoped that it will not be dropped from the syllabus.

Editors' Notes:- Frank VK3FJP is one of those rare characters whom one is fortunate to meet but seldom in one's lifetime with an endless supply of anecdotes and history. Frank has seen the development of most of what we take for granted now, starting from the old "spark gaps" to modern satellite equipment.

Frank has been at sea, worked for DCA, the Flying Doctor, on oil rigs in Bass Strait, copied Japanese CW during the war in RAAF intelligence (if you think ordinary morse is difficult, have a listen to the Japanese Kana code some time).

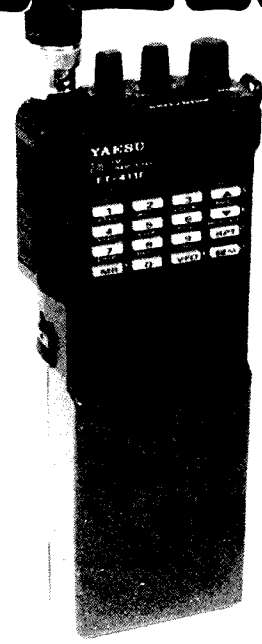
He is still a First rate CW operator, and is active on 20m with a101B and a Butternut vertical. Frank also acts as a Morse examiner for the Eastern Mountains District Radio Club AOCP program.

ar

SPECIAL OFFER

PURCHASE ANY OF THESE YAESU HAND-HELDS THIS MONTH AND YOU CAN SAVE $49 ON A SPARE NICAD BATTERY PACK! THAT'S RIGHT, YOU CAN PURCHASE A SPARE FNB-14, 1000mA/H NICAD BATTERY (D-3351) FOR THE SUPER LOW PRICE OF JUST $50 WITH ANY OF THESE YAESU HAND-HELD TRANSCEIVERS. *THAT'S AN INCREDIBLE $49 SAVING!*

FT-411E ENHANCED 2m HAND-HELD



Our best 2m hand-held! The enhanced FT-411E now provides both improved receiver sensitivity and better rejection of out-of-band signals, whilst retaining its compact size (55x155x32mm) and ease of use.

The multi-function back-lit keypad allows fast frequency entry, plus programming of the 49 tuneable memories (and the 10 DTMF memories), setting of the programmable 'power saver' system and a host of other convenient functions.

The microprocessor control system also features 2 VFOs, top mounted rotary dial tuning in 5 selectable tuning steps, a back-lit 6 digit LCD screen with bar-graph PO/S-meter, and a range of scanning features including busy channel, band, or selective memory scanning and priority channel monitoring. VOX (Voice Operated Tx) circuitry is also provided, allowing hands-free operation with the optional YH-2 headset. The FT-411E is supplied with an ultra long-life 7.2 V 1000mAh Nicad battery pack, carry case, belt clip, 'rubber duckie' antenna and approved AC charger.

Cat D-3350

2 YEAR WARRANTY

$449

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10, 12.5, 20 & 25kHz
Supply Voltage:	5.5-15V DC
Output Power:	2.5W @ 7.2V
Current Consumption —	
Stand-by (with 1 sec. save):	7mA
Receive:	150mA
IF. Frequencies:	21.4MHz, 455kHz
Sensitivity (12dB SINAD):	Better than 0.158uV

Ultra Compact

FT-23R 2m HAND-HELD

The FT-23R is an ultra-compact (just 55x139x32mm) microprocessor controlled hand-held transceiver that offers extremely rugged construction and exceptional ease of use. It covers 144-148 MHz and features include 10 memories which store frequency and repeater offset, 6 digit LCD with PO/S-meter, band/memory/priority scanning, 1MHz up/down stepping for fast QSY, repeater reverse operation, selectable tuning/scanning steps, diecast transceiver casing, FNB-10 600mAh NiCad battery pack giving 2.5 watts output and rubber gasket seals around all external controls and connectors. It comes with a mini 'rubber duckie' antenna, carry case, belt clip, and approved AC charger.

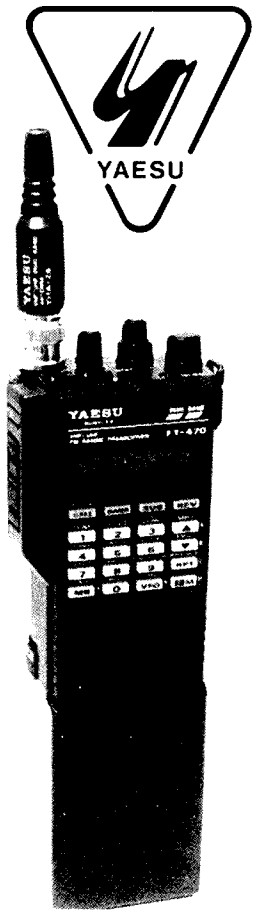
Cat D-3490

Specifications

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10kHz, 1MHz
Supply Voltage:	6-15V DC
Current Consumption—	
Stand-by:	19mA
Receive:	150mA
Sensitivity (12db SINAD):	Better than 0.25uV

2 YEAR WARRANTY

$369



2m & 70cm In One!

FT-470 DUAL-BAND HAND-HELD

Dual-band performance at its best! The FT-470 is a very easy to use hand-held transceiver that offers a high degree of flexibility through the use of a sensible multi-tasking microprocessor control system to provide both 2m and 70cm operation in one compact unit.

Dual independent IF circuits allow several functions to be performed simultaneously, including dual-band reception, and full cross-band operation. The FT-470 also has 21 tuneable memories and 2 VFOs per band, plus inbuilt C.T.C.S.S. (tone squelch) with a paging facility and a wide variety of scanning functions. A back-lit LCD screen shows a 5.5 digit frequency display on both bands simultaneously and a bargraph PO/S-meter lets you know exactly what you're doing. A programmable 'power-saver' system helps maximise battery life, allowing squelched receive current of as low as 7mA. The FT-470 comes with an ultra-high capacity 7.2V 1000mAh NiCad battery pack, carry case, belt-clip, dual band antenna and approved AC charger.

Cat D-3360

2 YEAR WARRANTY **$699**

Specifications

Frequency Coverage:	144-148MHz, 430-450MHz
Output Power:	2.3W (both bands, 7.2V)
Supply Voltage:	5.5 to 15V DC
Current Consumption—	
Stand-by (with 1 sec. save):	8mA (each band)
Receive:	150mA (each band)
Sensitivity(12dB SINAD):	better than 0.158uV (both bands)
Size:	55 x 180 x 32mm

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Serious Amateurs Deal With The Professionals

VHF/UHF BASE STATION ANTENNAS

These high quality, vertically polarised base station antennas are ideal for the discerning Amateur operating on the 2m, 70cm or 23cm bands. They're beautifully constructed Diamond brand antennas from Japan and provide high gain for maximum range. Constructed from robust F.R.P. tubing for excellent all-weather operation, with ground-plane radials for a clean radiation pattern.

2m ANTENNA F23A

Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x 5/8λ co-linear
Cat D-4850

$199

2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x 5/8λ(2m), 4 x 5/8λ(70cm)
Cat D-4860

$199

2M/70cm ANTENNA X-500A

Frequency: 144-148MHz, 430-440MHz
Gain: 8.3dB on 2m, 11.7dB on 70cm
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 5.2m
Type: 3 x 5/8 λ(2m), 8 x 5/8 λ(70cm)
Connector: N-type socket
Cat D-4865

Due Oct.

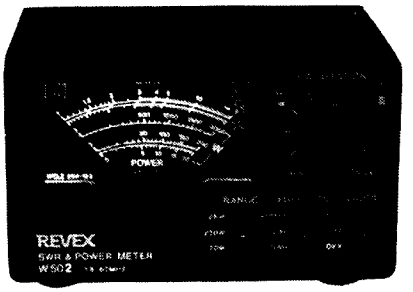
$279

23cm ANTENNA F-1230A

Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
Length: 3.06m
Type: 25 x ½λ co-linear
Connector: N-type socket
Cat D-4870

Limited Stocks!

$249

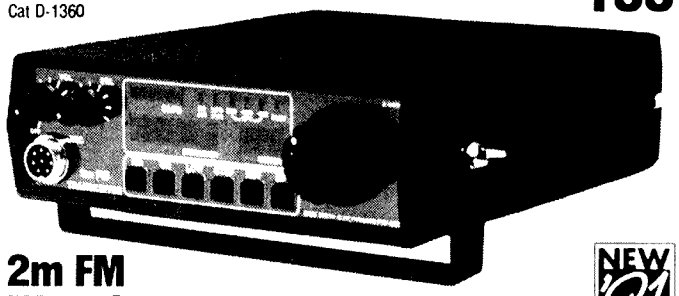


HF/6m POWER/SWR METER

A superb wideband SWR/Power meter which boasts quality Japanese construction and a truly accurate P.E.P. metering circuit (unlike many 'other' so called P.E.P. monitor systems). The Revex W502 features solid construction with an all-metal case and a large back-lit meter... and it covers the 1.8 to 60MHz range with less than 0.1dB insertion loss. With 20W, 200W and 2kW power ranges and LED indicators which show average or P.E.P. operation. Requires 13.8V DC @ 200mA power supply.

Cat D-1360

$199



2m FM TRANSCEIVER KIT

NEW '91

This outstanding high performance FM transceiver can be used as either a mobile or base station on the 144-148MHz amateur band. It must be one of the easiest transceivers of its kind to build yet it comes loaded with advanced features like....

- Full PLL frequency synthesis
- 24 memory channels which store repeater shifts
- 25W or 5W switchable output
- 5kHz and 25kHz tuning steps
- Microprocessor control system
- Excessive SWR safety shut-down circuitry
- 0.15uV typical sensitivity at 12dB SINAD
- 30kHz selectivity at -60dB
- -60dB image rejection

At this price you can afford to take the challenge! Kit includes all components, hardware, heatsink, detailed construction and testing information, and a pre-punched silk screened front panel. Microphone is not supplied. YAESU D-2110 or D-2105 are recommended.

Cat K-6400

EA Jan, Feb, Mar '91

Only $399

2m ½ WAVE BASE STATION ANTENNA

An outstanding value for money, compact, Australian made base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection and comes with a 5 year warranty.

Cat D-4820

MOBILE ONE

$49.95

NSW • Albury **21 8399** • Bankstown Square **707 4688** • Blacktown **671 7722** • Brookvale **905 0441** • Bondi **387 1444** • Campbelltown **27 2199** • Chatswood Chase **411 1955** • Chullora **642 8922** • Gore Hill **439 5311** • Gosford **25 0235** • Hornsby **477 6633** • Hurstville **580 8622** • Kotara **56 2092** • Liverpool **600 9686** • Maitland **33 7866** • Miranda **525 2722** • Newcastle **61 1896** • North Ryde **878 3855** • Parramatta **689 2188** • Penrith **32 3400** • Railway Square **211 3777** • Sydney City **267 9111** • Tamworth **66 1711** • Wollongong **26 3600** **ACT** • Belconnen **(06) 253 1785** • Fyshwick **80 4944** **VIC** • Ballarat **31 5433** • Bendigo **43 0366** • Box Hill **890 0699** • Coburg **383 4455** • Dandenong **794 9377** • East Brighton **592 2366** • Essendon **379 7444** • Footscray **689 2055** • Frankston **783 9144** • Geelong **232 711** • Melbourne City **399** Elizabeth St **328 6068** & 246 Bourke St **639 0396** • Richmond **428 1614** • Ringwood **879 5336** • Springvale **547 0522** **QLD** • Brisbane City **229 9377** •Buranda **391 6233** • Cairns **311 515** • Chermside **359 6255** • Redbank **286 5599** • Rockhampton **27 9644** • Southport **32 9033** • Toowoomba **38 4300** • Townsville **72 5722** • Underwood **341 0844** • **SA** • Adelaide City **223 4122** • Beverley **347 1900** • Elizabeth **255 6099** • Enfield **260 6066** • St. Marys **277 8977** **WA** • Cannington **451 8666** • Fremantle **335 9733** • Perth City **481 3261** • Midland **250 1460** • Northbridge **328 6944** **TAS** • Hobart **31 0800** **NT** • Stuart Park **81 1977**
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Mobile Excellence

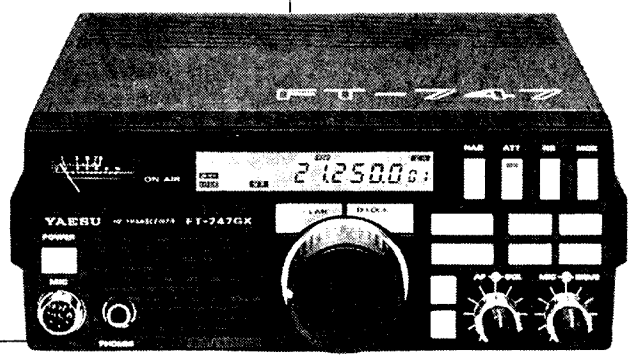
2 YEAR WARRANTY!

FT-747GX BUDGET H.F. TRANSCEIVER

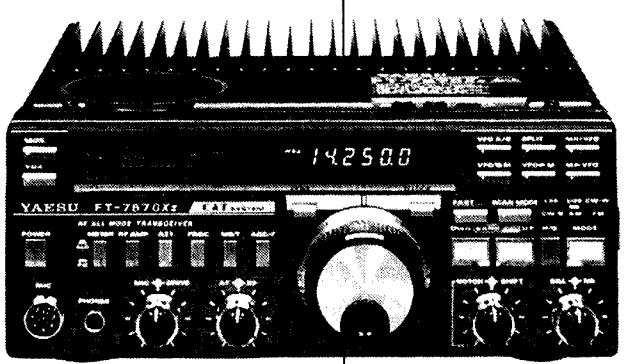
The FT-747GX is a compact SSB/CW/AM and (optional) FM transceiver providing 100 watts of PEP output on all 1.8-30MHz amateur bands and general coverage reception from 100kHz to 30MHz. Convenience features include a front panel mounted speaker and unobstructed digital display, dual operator selectable tuning steps for each mode, dual VFO's for split frequency operation and 20 memory channels (eighteen of which can store spilt Tx/Rx frequencies). Wideband 6kHz AM, and narrow 500Hz CW IF filters are also fitted as a standard feature. Includes Yaesu MH-1 hand microphone. See ARA Review — Vol 11, Issue 11.

Cat D-2930

$1199



2 YEAR WARRANTY!



Our Most Rugged HF Mobile Transceiver!

ALL MODE HF TRANSCEIVER FT-757GX II

Ready for action! Whether in a demanding H.F. mobile situation, or at home in the shack, the FT-757GX II won't let you down.
Based on its popular predecessor, the new MK2 features the heavy duty die-cast heatsink and rugged metal chassis of the earlier 757GX, but has been substantially upgraded to offer a number of new features. These include...

- All mode operation — SSB, CW, AM, FM(160m-10m)
- 100 watt output on SSB, CW, FM (25W AM) at 100% duty cycle
- High performance general coverage receiver — 150kHz to 30MHz
- Dual VFO's with single button VFO/memory swap functions
- Memories store freq. and mode, plus allow band scanning between adjacent memories
- Inbuilt 600Hz CW IF filter, IF shift and IF notch filters, variable noise blanker, Speech Processor, iambic CW keyer, and SWR meter. Includes MH-1 hand microphone.

Cat D-3492

$1795

2 YEAR WARRANTY!

Can you meet the 6m challenge?

FT-650 6m ALL-MODE TRANSCEIVER

Yaesu's new FT-650 all-mode mobile transceiver has been designed with the 6m enthusiast firmly in mind. With continuous reception from 24.5 to 56MHz, you can follow the rising M.U.F. and work the 6m DX as soon as the band opens. Output is a powerful 100 watts on the 24.5, 28, and 50MHz bands (SSB, CW, FM), and the use of 3 Direct Digital Synthesizers results in extremely clean Tx and Rx operation. Particular attention has been made to the receivers performance, with 6 Band Pass Filters and a 2 stage, low noise, RF Amp being used to provide exceptional sensitivity (SSB/CW, 0.125uV) and wide dynamic range. Features include user selectable tuning steps, manual or automatic tuning IF notch filter, an IF shift control for interference rejection, an IF bandwidth control, 105 scannable memories, a Speech Processor, and an effective noise blanker. Includes Yaesu MH-1 hand microphone.

Cat D-3250

Introductory Price $1995

FT-650 due Dec 91,
PLACE YOUR ORDER NOW!

DICK SMITH ELECTRONICS

B1201/PB

YAESU

VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169, MENINGIE 5264

Australian Amateur Bands Beacons

Freq	Callsign	Location	Grid Square
50.053	VK3SIX	Hamilton	QF02
50.056	VK8VF	Darwin	PH57
50.066	VK6RPH	Perth	OF78
52.320	VK6RTT	Wickham	OGB9
52.325	VK2RHV	Newcastle	QF57
52.330	VK3RGL	Mount Anakie	QF22
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.470	VK7RNT	Launceston	QE38
52.485	VK8RAS	Alice Springs	PG66
144.400	VK4RTT	Mount Mowbullan	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK4RSY	Sydney	QF56
144.430	VK3RTG	Glen Waverley	QF22
144.445	VK4RIK	Cairns	QH23
144.445	VK4RTL	Townsville	QH30
144.460	VK6RPH	Perth	QF78
144.470	VK7RMC	Launceston	QE38
144.480	VK8VF	Darwin	PH57
144.485	VK8RAS	Alice Springs	PG66
144.530	VK3RGL	Mount Anakie	QF22
144.550	VK4RSE	Mount Gambier	QF02
144.600	VK6RTT	Wickham	OG89
144.800	VK5VF	Mount Lofty	PF95
432.160	VK6RPH	Perth	OF78
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.445	VK4RIK	Cairns	QH23
432.445	VK4RTL	Townsville	QH30
432.450	VK3RAI	Macleod	QF22
432.535	VK3RMB	Mount Buninyong	QF12
1296.410	VK1RBC	Canberra	QF44
1296.420	VK2RSY	Sydney	QF56
1296.440	VK4RSO	Brisbane	OG62
1296.445	VK4RIK	Cairns	QH23
1296.480	VK6RPH	Perth	QF78
2304.445	VK4RIK	Cairns	QH23
2306.440	VK4RSD	Brisbane	OG62
10445.00	VK4RIK	Cairns	QH23

Brunei

Andy VK1DA (ex V85DA in Brunei) returned to Canberra as of February 1991. His last 6m contacts in the V85DA log were on 2/12/90 when the band opened to Japan around 0200. Andy's five-element Yagi was left in Brunei where it will be used by Brian V85EB who has an FT690 and would like to build an amplifier. He will probably be there for a year or so.

An analysis of Andy's 6m log shows a total of 1278 contacts with 874 unique calls. Of these, 787 were to Japan, 54 VK, 13 VS, four HL four YB, two DU, two XX9 and one each to 5H, FK8, KG6, KL7, P29 and JD1.

Looking over his 30 months of operation from Brunei, Andy's impressions are that the tropics are not an ideal place for F layer 6m DX. When the early morning openings to South and Central America were being experienced in VK, ZL and the South Pacific, the band was empty in Brunei as it was a further two hours later.

When the Europeans were being worked by VKs, the band was closed tight at Andy's QTH. One day, while at work, he received a phone call from David Rankine 9V1RH who told him that PA stations had worked VK stations from 0800 to 0830 the previous day. Despite several subsequent days of checking Andy heard nothing.

Many times beacons were heard from VS6, H44 and VK4 without there being any response on six metres or 28.885! The VK4RTL beacon was often audible around 1500 to 1700 with weak, but stable, signals.

Six metres was an interesting band when it was really open to JA. FM contacts were in progress on channels commencing at 51 and going in 10kHz increments all the way up to 54MHz. Andy wondered what the Australian 52.525 FM net channel sounded like at times, as the JAs have something like packet radio operating on that frequency.

We are grateful that, during his stay in Brunei, Andy several times communicated his experiences to his fellow amateurs in VK. We hope he now has some rewarding experiences following his return to Canberra.

Cruising South

During the summer Gil VK3AUI cruised to the Antarctic on the World Explorer mainly for historic interest and bird-watching. He looked for evidence of 6m operations, but found none.

On Macquarie Island he said the shack is in a good spot, but would need some dedication to climb up to it in bad weather. David VK0CK would know about that! On Campbell Island there are high hills obscuring the view, so it would need high angle signals to penetrate there. There were no 6m antennas in sight on the Antarctic continent.

It seems a pity that no opportunities presented themselves for a 6m operator to set up a station on the Antarctic continent in order to explore F type DX during Cycle 22. It may now be a long time before there are any answers.

Using 50MHz

The granting to most Australian amateurs of the privilege to use the lower end of the 50MHz band (in line with more than 150 countries around the world) has provided us with a facility with almost boundless opportunities for world-wide contacts.

When confined to 52 to 54MHz during and prior to Cycle 21, we were placed at considerable disadvantage compared with countries permitted 50MHz. The fact that many amateurs did work overseas countries was, in part, due to an advertising campaign where we let it be known overseas that we could not be worked on 50MHz and that overseas stations would need to shift to 52MHz for legal contacts to ensue.

However, there were problems with this arrangement. First, we had to let the overseas amateurs know we were hearing them on 50MHz. Thus, it was not at all uncommon, when listening to a 50MHz station, to suddenly hear a voice say "you are being heard in VK" and nothing else! Second, it was not always plain sailing for the overseas amateur, as some rigs were not very efficient at 52MHz, and the antennas decidedly poor - our antennas worked better at 50MHz than theirs did at 52MHz - please refer to your antenna theory!

Notwithstanding the above, we missed many countries due to our 2MHz isolation. Also, that 2MHz was sometimes too high for the MUF, with stations on 50MHz but not 52MHz! However, that 2MHz isolation ensured we did not clobber the 50MHz region (particularly the international calling frequency of 50.110MHz) with our domestic and Es signals.

With the approach of the spring equinox and likely availability of further long distance F2 contacts, I continue to support other writers who request that the international DX window should be kept for such contacts. If you do no more than keep out of 50.090 to 50.120MHz (and especially 50.110) it will help. 50.125 has been suggested as a domestic calling frequency and this is close enough to the international window for overseas stations to hear you and break-in if they desire.

Our domestic contests ought to be conducted on 52MHz - it was pleasing to note that during the recent Remembrance Day Contest contacts were made on 52MHz, and that's where the Ross Hull Contest also should be conducted. These days, as most rigs have twin VFOs it is so easy to have one working on 52MHz and the other able to monitor 50MHz by the flick of a switch.

As I am anxious to get off my annual use of the soap-box, what all this means is that you are again being asked to respect at least the international 50MHz segment and keep domestic working to 50.125 and above.

Finally, a suggestion. Would those VK4s and any other eastern seaboard amateurs who have consistently worked the same DX stations with 5x9 reports and who can hear the weaker signals from the states to their west and south-west calling for the DX station, consider helping those stations to make it to what are probably new countries for them! You can help by telling the DX stations which Australian call areas (not callsigns) are hearing them. This used to be done back in the AM days, when there was heavy eastern states QRM and VK6s wanted to work ZLs, then a rather rare occurrence, VK5s would clear a path for the ZLs. Such a consideration today, I am sure, would be appreciated both in Australia and overseas and earn some plus marks for you too.

Early 50MHz Contacts

From *CQ Ham Radio* for May 1991 courtesy Graham VK6RO comes an item re early 50MHz contacts. It appears Bob VK4NG was the first VK station to work Japan on six metres with a contact on 22/1/1956 at 1340 JST to JA1AHS who used an AM transmitter with a 6K6 oscillator, 6K6 doubler to an 807 running 50-60 watts. The receiver was a 6J6, 6AK5, 6AC7, 6J5 into a K/CM/11 tunable IF. The equipment Bob used was not listed.

The article also mentioned other notable contacts as between VK5KL and W7ACS/KH6 for a distance of 8640km on 26/8/1947, VK6HK to VR2CG (Fiji) at 6330km and VK6WG to VR2CG at 6145km, both on 3/1/1955. A 2m contact between VK3GM/3 and VK7LZ/PF bridged 511km on 9/3/1952.

Helium-Neon Laser Contact

From the September 1991 issue of *QST*, courtesy of Bill Tynan's "World Above 50MHz", is mention of an interesting 57.7 mile (92.3km) contact by the Ventura Radio Club group operating K6MEP and WA6EJO/WA6JOX. The group claims a world record for the contact on 474THz (red visible light) using a helium-neon laser. (Where to next? ... 5LP).

General News

The onset of lousy weather conditions consisting of gale force winds, thunderstorms and heavy rain across much of southern Australia during the latter half of August saw greatly diminished activity on all bands. Six metres virtually died, although Steve VK3OT did work JA1 and JA3 between 0400 and 0407 on 20/8.

The cold conditions brought to a halt much of the activity on bands above two metres. Signals on 1296MHz between VK5AKM and VK5LP dropped from 5x9 to 5x1/3. In my own case, much of the time the equipment was disconnected from the antennas to guard against static discharges from lightning, and the antennas were parked in the storm position (south-west). The same occurred with most other stations. With the onset of spring in September we are hoping for improved conditions and the re-opening of six metres.

Late News

It appears six metres will not close! John VK4ZJB reported on 1/9 that V73AT had worked BV2DP around 0318. Incidentally, there seems considerable doubt as to the validity of these contacts to Taiwan as they do not appear to be legally licensed. Also reported that on 2/9 Ron VK4BRG had worked W3s and on 3/9 Brisbane stations had a good opening to W5 from 0030 to 0130. Although I monitored the band all day there was no breakthrough to VK5 or VK3.

With the breaking up of some European countries it is possible new call areas will be available on six metres. New countries are likely to include Yugoslavia (YU), Romania (YO), possibly some USSR republics, and Israel (4X1).

ZL beacons are soon to appear on 50.043 and 50.0525 with the latter being too close for comfort to VK3SIX on 50.053. Please consider!

Steve VK3OT reported to me that he will be processing all VHF awards, and these include WAVKCA and WAS certificates, also the new Grid Square awards for VHF/UHF.

Closure

With little else that is news, there seems to be no need to prattle on. But, by the time you read this, hopefully six metres will have provided some interesting contacts.

Closing with two thoughts for the month: "It was not the apple on the tree, but the pair on the ground which probably caused the trouble in the garden", and "Kindness is a language which the deaf can hear and the blind can read".

73 FROM THE VOICE BY THE LAKE

ar

AMSAT

BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD, YARRAVILLE 3013
PACKET: VK3JT@VK3YZW

National Co-ordinator
Graham Ratcliff VK5AGR
Packet VK5AGR @ VK5WI
Please take note of the AMSAT information nets:
AMSAT AUSTRALIA net:
Control station VK5AGR
Check-ins commence at 0945z on Sunday nights
Bulletin commences at 1000z
Frequencies 3.685MHz or 7.064MHz. At present 7.064MHz is used.
AMSAT SW Pacific net:
2200z Saturday on 14.282MHz.

Experienced satellite users and newcomers alike are welcome on the nets. A large body of experience is on hand to answer queries. Listen to the WIA Divisional broadcasts for regular AMSAT information.

AMSAT Australia Newsletter and Computer Software:

Satellite users, whether experienced or newcomers, will benefit by subscribing to the AMSAT Australia newsletter and software service. The newsletter is published monthly by Graham VK5AGR. Subscription is $20 payable to AMSAT Australia, addressed as follows: AMSAT Australia, GPO Box 2141, Adelaide 5001

The newsletter provides up-to-date information on all current and planned satellite activity. Graham also provides a first class software service for satellite users. New software is reviewed regularly in the newsletter.

Thanks a million to Maurie Hooper VK5EA for keeping the flag flying for the past two and a half years. I know the column has been very well received during that time. I hope I can keep up the high standard he has set.

DOVE-1, ie OSCAR-17 has been a bit erratic in operation since its launch in January 1990. It resumed transmitting recently and its telemetry is again available on 145.825MHz (FM). Packet operators will find it interesting to receive and decode the telemetry signals. Dove transmissions are able to be directly displayed using a normal packet radio setup. It also appears to be transmitting forth telemetry as part of the downstream. Signals are strong enough to get good copy on a ground plane if you have a quiet location. Try it. Bulletins sent along with the telemetry indicate that the voice synthesiser should be on shortly. Whole of orbit data (WOD) collection is in progress and the controllers are preparing to upload the final software version. The name DOVE is an acronym for Digital Orbiting Voice Encoder.

PACSAT, ie OSCAR-16 BBS is back on line. Watch the BBS messages and the telemetry text for news of operations. PACSAT has four uplink AX.25 FM channels on two metres with PSK and raised cosine (SSB) downlink on 70cm. For the really adventurous, S band operations will resume shortly.

LUSAT, ie OSCAR-19 is out of service. The file server has crashed and the command team at AMSAT-Argentina requests that users not attempt to use the BBS or digipeater until further notice. Watch PACSAT or UO-14 for updates.

Regular satellite users will be familiar with the works and reputation of Dr Karl Meinzer DJ4ZC. Karl recently raised a few eyebrows at the AMSAT-UK Colloquium (July 1991). He proposed that radio amateurs send an amateur radio spacecraft to *Mars!!* Karl outlined how this could be done using current technology like that in the present batch of Oscars. He suggested a transponder on 2400MHz and a launch along with the planned Phase 3D satellite in 1995. One can only speculate on the new challenges this would pose for satellite users. No doubt it would use the new electrical plasma thruster engine developed by Professor Messerschmitt of Stuttgart University. (An option also for P3D).

ASERA - Australian Space Engineering Research Association. Previously the Australian Amateur Space Engineering Society, formed in July 1990, ASERA has been actively planning the first Australian amateur radio microsat. To be known as VKSAT, it will be

based on the AMSAT-NA microsat design similar to Dove, Pacsat etc. Fund-raising is in progress, but to date has fallen so far short of target that the project has been put on hold. Despite a very generous $2000 grant from AMSAT-UK, and some local support, ASERA has been unable to raise the $20,000 necessary to purchase the microsat engineering plans and specs from AMSAT-NA. These plans are absolutely necessary, as going it alone would be rather like re-inventing every wheel in history. If other countries like Argentina and Italy can do it, why not Australia? This may be the first you've heard of ASERA. If you'd like to know more and (hopefully) support its efforts by becoming a member, the address is below. Please consider giving your support to this effort. It would be great to see VK back up there. How many of you can remember Project Oscar Australis, ie Oscar-5? ASERA is also scheduled to provide an imaging system and a mode-B transponder for the Phase 3D spacecraft. ASERA is based in Sydney and there are active groups operating in other states. Tony Bartell VK3ZOT is co-ordinating the mode-B transponder project in Melbourne. ASERA has close ties with the CSIRO division of radio physics, the Australian Space Office and the AUSROC groups based in Adelaide and Melbourne. Ausroc-1 was launched on 9 February 1989. Ausroc-2 is under construction. Ausroc-3 is planned as a test for the final rocket which is designed to achieve a low earth orbit with a payload of 25-50kg. The ultimate aim is to launch an Australian amateur radio satellite with an Australian built launch vehicle. You may have seen the recent Gladesville ATV test transmission. One of the interviews featured Craig Lindley, President of ASERA. Craig outlined the aims and objectives of the group and detailed progress so far. If you're interested in finding out more about ASERA, contact the secretary at: Australian Space Engineering Research Association, PO Box 184, Ryde 2112.

Software Protection

Readers should note that the sale of software is one of the major sources of revenue for AMSAT world-wide. No revenue ... no more satellites. Heroic efforts by a small number of individuals have given us the opportunity to enjoy some very sophisticated programs. The majority of these are donated to the AMSAT organisation for the express purpose of fund-raising. It must break the authors' hearts to see them pirated by **fellow amateurs.** I am therefore appealing to your sense of fair play when dealing with satellite-related software. Most of it is not, repeat **not** public domain or share ware. Most is copyright and clearly marked so. Please abide by the authors' requests NOT to copy except for back-up purposes. Please don't give a copy to your friends out of the goodness of your heart or because you owe them one. Every time you do this you deprive AMSAT of the very stuff that new satellites are made of. Conscience just pricked you? Then send a donation to AMSAT-VK. Be assured, it'll be passed on to the appropriate place and then *everybody* is a winner. AMSAT is a *non-profit* organisation.

Speaking of Software: Graham VK5AGR recently announced in his newsletter that two more excellent bits of software are available. DTLM (July 1991) from the University of Surrey, and SPLOT. They are for IBM-type machines. DTLM is a tabular telemetry display program. It will handle the UoSats and *all* the microsats. It comes with the necessary utilities to convert KISS capture files to files suitable for use with SPLOT. The SPLOT program will graphically display telemetry on EGA/VGA.

Software files by satellite: Oscar-14, the third operational UoSat from the University of Surrey, is going like a rocket (sorry). UoSat Oscar-14 is a packet radio satellite with a difference. Running 9600bps AFSK, downloading is very fast, and the new "broadcast protocol" makes it a dream to operate. It's not even necessary to be connected to achieve results. Using the appropriate software, the files are tucked away in your system and any bits missed on one pass (holes) are filled in on the next and subsequent passes until the file is complete. I think it's worked by magic. It's probably the most advanced amateur satellite so far and it points the way to the future of amateur radio digital satellites. There are messages, pictures, CCD image files, weather sat pix, computer programs etc. If you don't have a suitable modem but would like to see some downloaded files, Graham VK5AGR has a large selection. They are available for the usual formatted disc(s), donation and return postage. One look and you'll be building a G3RUH modem for sure. UoSat-F or UoSat Oscar-22 is undergoing commissioning and will further extend this form of operation. ar

Satellite Activity for May/June 1991

1. Launches

The following launching announcements have been received:

Intl No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1991-							
036A	COSMOS 2149	24 May	USSR	89.7	377	176	67.2
037A	AURORA II	29 May	USA	1400.4	35509	34660	0.2
038A	PROGRESS M-8	30 May	USSR	86.6	249	191	51.6
039A	OKEAN-3	04 Jun	USSR	97.8	679	652	82.5
040A	STS-40	05 Jun	USA	90.1	302	276	39.0
041A	COSMOS 2150	11 Jun	USSR	100.8	823	785	74.0
042A	COSMOS 2151	13 Jun	USSR	97.8	676	648	82.5
043A	MOLNIYA 1-81	18 Jun	USSR	12h16m	40825	457	62.8
1986 0170V	MAK-1	17 Jun	USSR	Deployed from MIR			

2. Returns

During the period 39 objects decayed, including the following satellites:

1967-027A	Cosmos 151	06 May
1976-116A	Molniya 2-16	21 Feb
1981-020A	Progress M-7	07 May
1987-036A	Cosmos 1838	15 May
1987-036B	Cosmos 1839	08 May
1991-020A	Progress-7	07 May
1991-031A	STS-30	06 May
1991-031B	IBSS	06 May

3. Notes

1990-107A SOYUZ TM-11

The spacecraft's descent vehicle with Soviet and British astronauts landed in Kazakhstan, USSR, on 26 May 1991.

Bob Arnold VK3ZBB ar

CONTESTS

(Information provided by the relevant contest managers)

Ross Hull Contest 1991-1992

As mentioned in April *AR*, there will be several rule changes for the 1991-1992 Ross Hull Contest. The main changes suggested by entrants were:

1. Contest "days" to begin at 1800 UTC, to encourage evening activity and prevent the mid-morning "peak hour".
2. The contest to be shortened. Tentative dates are Saturday, 21 December to Saturday, 11 January (inclusive). Any comments?
3. Last year's overwhelming advantage to six metres to be corrected by setting the maximum possible score per 6m contact to 10 points, and setting the band multipliers as follows:

6m	2m	70cm	23cm	2.3 GHz	Higher
X 1	X 4	X 7	X 10	X 15	X 20

Under this arrangement, six metres would

run more closely "neck and neck" with two metres and 70cm in scoring potential.

4. Calling frequencies: Much contest operation is between strong local stations, yet the DX calling frequencies are for weak or unpredictable DX that needs to be heard while it lasts. It may help to nominate preferred contest working frequencies to prevent local interference to weak signals. The following are suggested:

6m: 52.100 preferred; otherwise 50.140 (top end of the ZL window). No contest exchanges on or near 50.110.

Other bands; .150 on each band.

VHF-UHF Field Day 1992

This Field Day has now been adopted as a permanent feature of the contest calendar. Next time round it will receive better publicity and hopefully much greater support, especially on the higher bands. Two changes are being considered for this contest:

1. The date: If the Field Day is held on the Australia Day weekend, it would be on Australia Day itself (Sunday 26 January). However, it has been suggested that people may prefer to spend time with their families at the end of the school holidays, and it could be better to run the Field Day on the last weekend of the Ross Hull Contest. The Ross Hull Contest could also be extended by one day to take in the last Sunday, so that field day contacts could also be counted. COMMENTS PLEASE!

2. Scoring: It is proposed to keep the scoring simple by retaining the grid locator system. This could also allow the Field Day to act as an "activity day" for the new Grid Square Award. However, for consistency it is proposed to adopt the same band multipliers as used in the Ross Hull Contest.

ALARA Contest

Marilyn Syme
Contest Manager

Eligibility

All licensed operators throughout the world are invited to participate. Also open to SWLs.

Object

Participation

YL works everyone, OM works YLs only. One contest (combined phone and CW) run over 24 hours.

Starts Sat 9 Nov 91

at 0001 hours UTC.

Ends Sat 9 Nov 91

at 2359 hours UTC.

Suggested Frequencies

Bands to be used are 3.5, 7, 14, 21 and 28MHz only. The following are suggested frequencies for easier location of contacts:

28.380 to 28.410
21.190 to 21.200:21.380 to 21.410
14.250 to 14.280
7.070 to 7.100
3.560 to 3.590

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 crossmode.

Procedure

Phone: call "CQ ALARA CONTEST
CW: YLs call "CQ TEST ALARA"
OMs call "CQ YL"

Exchanges

ALARA member: RS or RST, serial number starting at 001, ALARA member, name.

YL non-member: RS or RST, serial number starting at 001, or OM name.

Scoring

Phone:
5 points for ALARA member contacted
4 points for YL non-member contacted
3 points for OM contacted

CW: Contacts where at least one operator is novice class count double points, otherwise same as phone

SWL:
5 points for ALARA member logged
4 points for YL non-member 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, callsign 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	Band MHz	Mode	Callsign	RS(T) & Serial No sent	RS(T) & Serial No rec'd	Name	Points
10/110135	28	SSB	VK3EBX	59001	58028	Joy	5
0141	21	CW	VK3KS	599002	599045	Mavis	10
0600	14	SSB	FK8FA	59025	59011	Aimee	5

LOGS MUST BE SIGNED. Logs also to show full name, callsign 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 Contest Manager by: 31 December 1990.

CONTEST MANAGER:
Mrs Marilyn Syme VK3DMS
PO Box 91
Irymple Vic 3498
Australia

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 score overall
Top score phone only
Top score Australian YL novice CW (Mrs F McKenzie cert)
Top score ALARA member in each country and VK call area
Top score YL non-member in each continent
Top score OM in each continent
Top score SWL in each continent
Top score VK novice
Top score overseas YL novice CW

TROPHIES will be awarded to the following:
Top scoring Australian YL
Top scoring DX YL

(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 callsign 2GA (later VK2SV). 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).

Sunshine State Jack Files Memorial Contest 1991 Results

Ted Mulholland VK4AEM
Box 35 Caloundra City 4551

Section 3, Stations Within VK4

A. TX All Band

VK4CNQ	586		

B. TX HF Phone

VK4CRR/M	2387		
VK4BB/M	1216	VK4IS	615
VK4AVR/P	1134	VK4NAD	534
VK4ADD	1040	VK4PVH	402
VK4JMP	861	VK4DRC	385
VK4LT	856	VK4SEA	348
VK4ACL	791	VK4PJ	250
VK4MCY/P	705	VK4PT	220
VK4NSB	652	VK4KRR	207

C. Club Stations TX HF Phone

VK4WIE/M	3267		
VK4WIZ	752		
VK4BAR/P	506		

Section 4, Stations Outside VK4

A TX All Band

VK2MUZ	682	ZL2SM	650

Some Comments from Participants

VK4MCY: I thoroughly enjoyed the competition this year. VK4NAD: ... my first competition and was most enjoyable. All stations conducted themselves politely. VK4PVH: ... to express my thanks to the other operators who took time to help me. VK2MUZ: This is one radio competition that is conducted in the real spirit of amateur radio. VK4CRR: Enjoyed it as usual ... very cold.

Comment by Contest Manager

About the same number of contestants as in earlier years; very pleasing to see newcomer

logs. Special mention to VK4SEA who took opportunity to hold BBQ in conjunction and introduce some newcomers to amateur radio.

Results of WIA 1991 Novice Contest

The number of entries in this year's contest was very disappointing. There were only 26 in the phone section and 5 in the CW section, with one SWL entry. This compares with 34, 10 and 2 respectively last year.

Perhaps the popularity of contests is diminishing or, as one entrant suggested, perhaps the contest just wasn't publicised enough.

An encouraging feature, however, was good participation by a number of clubs.

The Keith Howard VK2AKX Trophy will be awarded this year to VK2LEE for the highest aggregate Novice score.

The Clive Burns Memorial Trophy for the Novice entrant with the highest CW score has been won by VK3NZO.

Both of these perpetual trophies are held on permanent display at the Executive Office. In each case the winner will receive a suitably inscribed wall plaque.

Section A	Novice Winner	VK2LEE
Section A	AOCP Winner	VK3APC
Section B	Novice Winner	VK3NZO
Section B	AOCP Winner	VK6ANC
Section C	SWL	L40018

Individual Scores - Section A - Phone

VK3APC(c)	967	VK6NTJ	215
VK6ANC(c)	882	VK2SRM	188
VK4BB	874	VK7NXX	165
VK2LEE	864	VK2VZB	164
VK3GH(c)	833	VK3KAV	161
VK2ZL(c)	733	VK4VXX	150
VK2GJS	552	VK4AVR	141
VK4NEF	524	VK2ALE(c)	114
VK7NXA	433	VK1EV	90
VK3MBU	384	VK2LE	71
VK6JBL	381	VK2LDB	64
VK2SPT	292	VK2KIQ	62
ZL2LOW	248	VK2IS	60

Individual Scores - Section B (CW)

VK3NZO	64	VK6JBL	28
VK6NTJ	56	VK7NXA	27
VK2VZB	49	VK6ANC	10

Individual Scores - Section C (SWL)

L40018 248

Additional Certificates Recommended

For the highest aggregate novice score for each state, excluding national winners.

VK1 No entrants
VK2VZB
VK3MBU
VK4NEF
VK5 No entrants
VK6JBL
VK7NXA
VK8 No entrants

Other Special Awards Recommended

Section A	Section B
VK4BB	VK6NTJ
VK3GH	
ZL2LOW	

Comments

It was generally agreed that there was insufficient promotion of the contest this year and this no doubt contributed to the lower numbers of entries. It is hoped that this can be corrected next year.

Suggestions have been made that club stations including ZL and P2 should be designated as such by the addition of a suffix to their callsign be published in *Amateur Radio*.

Many entrants indicated their enjoyment of the contest and that they appreciated club participation. The amount of time and effort necessary for an individual to participate in a competitive manner was mentioned by one entrant and he suggested that the time for which a contestant can claim contacts should be limited.

These suggestions will be considered for next year's contest.

KEN MILLER, VK2GKM
NOVICE CONTEST CO-ORDINATOR
ar

AWARDS

JOHN KELLEHER VK3DP — FEDERAL AWARDS MANAGER
PO BOX 300, SOUTH CAULFIELD, VIC 3162

When I was appointed to this post, I was pre-warned that it was not an easy job. I can only half agree, because I have found that for all the tedious work involved there are rewards. To date I have processed more than 100 applications for awards to both local and DX operators. To me it has been a pleasure, and congratulations to those who, by now, will have received their awards.

To introduce myself: I am ex-RAAF, where I served as a telegraphist, wireless operator mechanic on H/F D/F (now Telecomm Tech), and finally as a wireless operator air (signaller). I learned my CW in the post office, using an old Clipsal key, a door buzzer and a bank of torch batteries. I started in the WIA as a short-wave listener and, three months later, obtained my licence. I now have about 270 DX countries confirmed, and a shack with plenty of "wallpaper".

RNARS

The Royal Navy Amateur Radio Society is currently sponsoring the following awards:

The South Australian Group RNARS has the HMCS Protector Award, requiring six contacts - a mandatory contact with VK5RAN, a contact with each of two other VK5 members and a contact with a member in each of three other states.

Cost of the award is $5 to Jack Peatfield, 1 Filmer Ave, Glengowrie 5044.

The New South Wales Group RNARS has the HMAS Sydney Award, requiring six points as follows: contact with the club station Snapper island VK2CC counts two points, plus four contacts with NSW members, or just six contacts with NSW members. Cost $5 to VK2KEW, PO Box 159, Warners Bay 2282.

The Canberra Group RNARS has the HMAS Canberra Award, requiring contacts with VK1RAN plus three other VK1 RNARS members and contacts with three special stations such as VK3RAN, VK4RAN, VK5RAN, VK6RAN and VK2CC. Cost is $3 to Barry Bennett, 6 Gibingbell Close, Ocean Shores 2483.

There is also the HMS Endeavour Award, requiring 15 points. Any RNARS member contact is one point, and contact with any club station is two points. Cost $2 to VK5FY QTHR.

The points are readily obtained, as the RNARS has nets on the following bands and frequencies:

Mondays	SSB	3.615	0930z	VK2FYM
Mondays	SSB	3.615	1000z	VK5RAN
Tuesdays	CW	3.520	0930z	VK3QU
Tuesdays	CW	3.527	1030z	VK6RAN
Wednesday	CW	3.527	1000z	VK5RAN

Snapper Island operates most Saturdays, both SSB and CW, various bands between 1000 and 1530 EST.

RNARS members, both local and overseas, are active on 14.052 and 21.052 and thereabouts daily when the bands are open on CW. Put out a call CQ RNARS to be sure of a reply.

The Rhododendron Festival Award, 1991

Rules

1. The Award will run from 2-17 November 1991 inclusive.
2. Contacts may be made on any band, any mode. Each station may be worked **once only** for each separate application for the Award.
3. NZ stations require 25 points from those categories below:

a) Compulsory contact with ZL6RFA - special

event station worth five points.

b) Contact with any Taranaki branch stations:

New Plymouth	ZL2AB	Br 27	3 points
Hawera	ZL2AWW	Br 14	3 points
Rahotu Coastal	ZL2ANN	Br 32	3 points
Waitara	ZL2TO	Br 47	3 points
Patea	ZL2QF	Br 54	3 points

c) Each additional Taranaki station 1 point

4. overseas stations require six points made up of *any* combination of the above in note 3). There is no compulsory requirement for overseas applicants.
5. Copy of log and fee to arrive before 31 January 1992 to: The Award Custodian, NZART Branch 27, c/- 45 Robe St, New Plymouth 4600, New Zealand.

Cost

1. For ZL award applications, $6.00 each.
2. For all overseas award applications, $US5.00 or a fair equivalent. *No* stamps or IRCs please - cheques preferred.

Note: The award fee covers all return postage charges.

General Information

The Rhododendron Festival Award started in 1988, and each year the award features a different full colour rhododendron flower.

There are *six* different flowers in this series; each one is a limited print with the kind permission of local artist, Janet Marshall. I am sure you will agree they are worth collecting.

This award is available to all amateurs and short-wave listeners.

ZL6RFA and branch stations will be operating on a roster basis during the award period, on or about the following frequencies:

The Rhodo Net 3.593MHz phone most nights from 0800 UTC.

The Awards Net: 3.677MHz phone most nights from 0900 UTC.

DX: 21.150MHz phone most nights from 0700 UTC.

Also popular VHF and UHF frequencies will be monitored, but any amateur frequency may be used.

Worked all GI

Rules

1 The award is available to licensed amateurs and SWLs (on a heard basis).
2. All bands, 1.8MHz to 1296MHz.
3. Cards must be for valid contacts on or after 1 January 1979 (1-1-79).
4. Contacts via terrestrial repeaters or with mobile stations are not valid for this award.
5. The award will be endorsed as follows:
   A Mode - CW SSB RTTY Mixed etc.
   B Band - HF or VHF (but not a mixture of both).
6. A checklist of QSLs set out in log form and certified by two licensed amateurs or photocopies of QSLs must be submitted with all applications.
   Do not send QSLs.
7. The cost is:
   Europe -Three pounds, fifty pence (sterling), IRCs 10
   Outside Europe - Four pounds (sterling), $US7, IRCs 12.
   Payment to accompany all applications.
8. Northern Ireland consists of six counties: Antrim, Armagh, Londonderry, Down, Tyrone, Fermanagh.

(Note: The city of Belfast is divided by the river Lagan into Co Antrim and Co Down).

9. Stations outside Europe require the following cards: two from each of Co Antrim and Co Down; one from each of the remaining four counties. Total eight cards. Stations from Europe require the following cards: four from each of Co Antrim and Co Down; 2 from each of the remaining four countries. Total 16 cards.

Applications should be forwarded to: The Award Manager, WAGI, GI4BBV, 11 Drumawhey Rd, Newtownards, BT23 3RS, Co Down, Northern Ireland, United Kingdom.

Cork Radio Club

Rules - Cork Radio Club DX Award

The award is available to licensed amateurs and short-wave listeners.

Contacts must be made with members of the Cork Radio Club or EI stations in County Cork as follows: DX stations need two contacts; European stations need three contacts; EI/G stations need four contacts.

Any band, any mode may be used. QSL cards not required.

Send only certified copy of the log, showing callsign, name, date, time, band and mode used. The fee for the award is six IRCs, or $US4 first class air mail. Every effort will be made to meet claims where insufficient funds are enclosed and a fund has been set up for this purpose. The award is sponsored by the Cork Radio Club DX Group.

Post application and fee to: Awards Manager, W O'Reilly, EI8AU, Mount Oval, Rochestown, Co Cork, Ireland.

The award may be endorsed 2 x SSB, all CW etc.

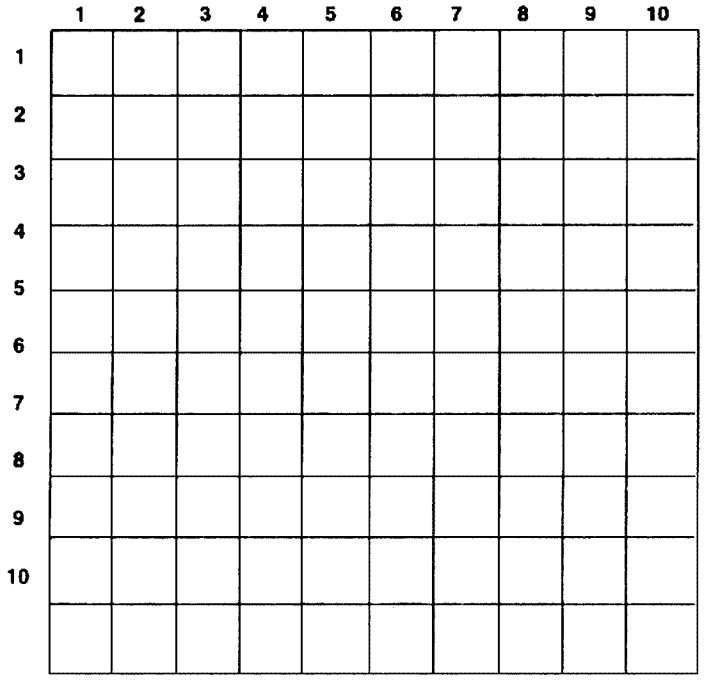
The certificate shows a map of County Cork at lower right-hand corner. All printing is in black, on a cream good quality card. The border and shamrock are in green. Size is 210mm x 296mm.

WIA Antarctic Award

I have received several applications for this award, which I am now processing. However, there is a small "glitch" in the works. To date, no design for the award has been reviewed or decided; the Institute is therefore calling for all artists to submit their designs to: Antarctic Award Design, PO Box 300, Caulfield South, Vic 3162. ar

Morseword No 55

Solution Page 56



Across:
1 Cycle
2 Green stone
3 Small delicatessen
4 Ship's record
5 Obstacle
6 Founder
7 Angle
8 Pert child
9 Slice of meat
10 Shoot

Down:
1 Cows chew it
2 Every
3 Useful thing
4 Talk wildly
5 Competed
6 Injection
7 Girl's name
8 Oath
9 Melodies
10 Eat and drink

HOW'S DX

Stephen Pall VK2PS
PO Box 93, Dural 2158

..."and please send your QSL card to Box 88 Moscow" ... said the heavily accented Soviet amateur at the end of the QSO. Sounds familiar? For years and years, day in, day out, QSL cards by the hundreds poured into a multi-storey building in Moscow which housed the Central Radio Club of that city. The QSL bureau or that club - the mysterious "Box 88, Moscow" - looked after the distribution of the QSL cards to all parts of the Soviet empire.

With the radical political changes which took part in the USSR just recently, it is now quite possible that each independent republic will establish its own independent system of QSL bureaus. QSL managers all around the world have to be sure they are sending the cards to the correct bureau, otherwise they might see in 12 months time a return package on their doorsteps. What other changes will occur in the crumbling empire? Who knows? Will there be a change in the Oblast numbering system? Is there a possibility of a "new" DX country? What happens to the Soviet awards system? Will amateur licences be issued individually by the remaining republics? What will happen to the vast number of radio clubs and their property? These clubs, until now, were sponsored by Soviet Army establishments, the Communist Youth Movement, the Communist Party and, quite often, by the KGB. How many new amateur journals will surface out of the depth of the dark? Will each republic have its independent radio amateur society? Will the number of Soviet SWL cards decrease, as they will not be provided free any more by the sponsors of the clubs? And finally: will the Soviet postal system change and will it deliver the envelopes containing the QSL cards, the IRCs and/or the "green stamps" intact to the recipients of those letters? These are just a few questions which came to my mind, to which - unfortunately - I have no answer.

Albania - ZA

August was "Albania month". The much anticipated activity which kept practically the whole international DX fraternity on its "fingertips" did not eventuate, despite some positive movements by the intending DXpeditioners. Early August the news came that HA0NNN and HA0MM left Hungary on 4 August for Tirana, the capital of Albania. A few days after, a second group, HA5PP and HA5HA, followed with its communication bus. This "bus" is equipped with a variety of transmitters, antennas and other amateur gear, and will be used in the future for an around-the-world land DXpedition. The two groups intended to work independently at the two ends of Tirana.

On 13 August, late in the evening, a telephone "alert" that ZA2QA and ZA5DX would be on the air within 30 minutes mobilised most of the "ZA" watchers. Nothing happened. Next day, the story came out. According to well-informed Hungarian sources, the licences were obtained and signed by the relevant PTT authorities, but at the last minute the military stepped in, declaring that the amateur frequencies are used by it as communication channels, and therefore no radio amateur operation will be permitted. Hearing this, the two Hungarian groups returned to Budapest. A few days later various French sources made known that it was anticipated that the Albanian parliament will discuss the whole communication question and amateur radio activity in the September session of the Albanian parliament, and that the first operator will be an Albanian national. At the end of August a new wave of "news" spread around which finally became a concrete announcement at the Tokyo annual Hamvention. The Secretary General of the Albanian PTT, Mr Agim Muco, and in a separate statement, the International Amateur Radio Union (IARU) both announced that amateur radio activity, after an absence of 45 years, will resume around the 15 or 16 September 1991. The formation of the Albanian Radio Transmitting Society was announced at the same time. This move, to introduce and train personnel in amateur ra-

dio, is sponsored by the IARU, with the assistance of JARL (Japan), ARRL (USA), ARI (Italy), the NCDXF (Northern Carolina DX Foundation, USA) and the equipment manufacturer YAESU (Japan).

The official launching of amateur radio will be attended by many invited participants from different countries, including Mr Tarjanne, the General Secretary of the ITU (International Telecommunication Union). A number of operators have been invited to Tirana around mid-September to train Albanian operators and work the pile-ups. According to Japanese reports, the group will include three American, two Japanese, three Italian, three Finnish, one German and one Dutch operator. Several callsigns were mentioned, like: ZA1TAA, ZA1TAB, ZA1TL, but it is expected that the opening activity will use the call: ZA1A. It was also said by other sources that the initial activity will be restricted to the 20-15 and 10m bands.

Well, good luck to everybody, and I hope that the pile-ups will be orderly and well conducted. There is no need to rush. This is not a DXpedition lasting a few days or weeks. Amateur radio has arrived in Albania and it is there to stay.

Pagalu (Annabon) Island - 3C0CW

This DXpedition was right on target and, after a few beginner's problems, has run smoothly for 10 days. They even showed up on various nets, despite the unfavourable propagation, and gave the VKs the opportunity to work this rare DX country and IOTA island (AF-039). QSL to: EA3CUU, Pedro Espuna Crespo, PO Box 220, Olot, 17800, Gerona, Spain.

Myanmar (Burma) - XY0RR

After months of preparation, the Russian team - Roman 4K2OT, Gene UA9MA, Harry RA3AUU and Romeo 3W44 - has arrived and went on air on 27 August 1991. The XY group was active mostly on 21295kHz, but showed up also on 14157, 14195 on 28495kHz, and on 80 metres. They were also active on the lower CW portion of the bands. Main activity was with the US and Japan, but early morning and late afternoon openings in VK has allowed the VKs to contact them. This was one of the costliest DXpeditions by Romeo. It was 25 years ago that Myanmar was on the air, known then as Burma. The budget of the expedition was $US45,000, and 40,000 Soviet roubles, but operating from one of the Myanmar-owned islands justified the high cost of the expedition. Travel to the island had to be by yacht. The operators had to travel by jeep through the jungle to meet the yacht south of Rangoon. Because Myanmar is in a state of civil war the operators' safety has cost money. The security equipment and weapons cost $4800, and the yacht charter $13,300 etc. So, if you were one of the lucky ones who worked XY0RR, please consider making a donation to the DXpedition funds, which are collected by Edward Kritsky NT2X, Box 715, Brooklyn, NY 11230 USA. Sponsors contributing over $US25 will receive a special Myanmar DXpedition medal. QSL to: Romeo Stepanenko, Box 812 Sofia, 1000, Bulgaria.

Frank VK1ZL, one of the net controllers of the "222" net.

Desecheo Island - KP2A/KP5

The 10-day operation by VP2VE, KP2A, WU2W, N2KW and VP5JM (YL) was a great success. The operators worked around the clock, being active on all bands including the WARC bands, both CW and SSB. Desecheo is a small rocky island in the Mona Passage, off the western tip of Puerto Rico. The only transport to the island is by a sailing boat, and it takes eight hours of sailing to get there. This was a disciplined operation without the frenzy of the usual dogpiles. QSL to: WA2NHA Howard Messing, 90 Nellis Dr, Wayne NJ, 07470 USA.

Bangladesh - S2

Last month I mentioned that there could be some legitimate activity from Bangladesh in the next two to three months. It was a very happy Jim Smith VK9NS who announced on 29 August that the Bangladesh PTT Board - the S2 version of our DoTC - has decided to introduce and allow amateur radio in Bangladesh. Further details of how this introduction will take place are not known. This is pleasing news for the whole of the radio amateur fraternity. The world is changing, and amateur radio is slowly spreading its wings into countries which previously rejected it on political and internal security grounds.

DX QSLing

In the May 1991 issue of *AR* I posed a number of questions to the managers of outgoing QSL bureaus about the destination of QSL cards where there is no QSL bureau on the "other side", or no QSL manager or route is shown on the card. To my surprise, the managers of the VK5 and VK2 outgoing bureaux replied, and I thank them for their assistance and co-operation.

Briefly, both bureaus say they never destroy any outgoing card, and if cards cannot be forwarded overseas because of the non-existence of the bureau or QSL manager, these cards then are returned by the bureau to the sender. The VK2 bureau said it usually returns 400 to 700 cards per year to the originators for this reason. Both bureaux have instructed their members to mark their cards on both sides with the callsign of the recipient of the cards, which should also include the QSL manager's callsign.

Unfortunately there was no information forthcoming from the other outgoing VK QSL bureaux.

160 Metres DX

Following my notes in last month's *AR* on 160 and 80 DX, it is interesting to read in a letter received from Bob VE7BS some time ago, the following: "The 160m propagation season of May to August is over, and I am happy to report that in the 1990 periods there were more than 200 contacts with about 38 VK stations. Another 37 VK stations were heard here at my QTH, which is about 14km from a small village, and 160km from the nearest high-powered broadcasting station," writes Bob. "My top band antennas are supported from tall trees. The apex of the full wave vertical delta loop is suspended from a pulley at 115ft, and it has a 0.42 base wire about 8ft above the grass. It is fed near one bottom corner, so is vertically polarised and more or less omnidirectional. For the VK sessions it is the more effective antenna when the band opens."

The next opening on 160 metres to North America will start in May next year, which gives the future "top band" enthusiast about six months to construct his special antenna for 160 metres. Incidentally, if my information is correct, there is a newsletter which appears twice a year for the 160m enthusiast. For further information, write to the *Top Band Bulletin*, PO Box 262, Mactier, Ontario, Canada POC 1HO.

Rwanda - 9X5HG

If you still need this particular country for your DX collection, listen in on the ANZA net (21205kHz, check-in at 0445 UTC), or go down to the lower end of the CW band segment and you will find there Hartmut 9X5HG. Hartmut is a professional radio engineer attached to a

German relay station broadcasting in Rwanda. Depending on his working arrangements, you might hear Hartmut around 0500, 1100 or around 2000 UTC times, working mostly in CW, and occasionally in the SSB mode.

Rwanda is a small country in East-Central Africa, just south of the equator (2° south, 30° east, area 26,338km², population estimate is five million; greatest distances - east-west 233km, north-south 177km). Germany established a colony in the area in 1897. It was occupied by Belgium in 1916 and became a mandated territory under Belgian administration in 1923. Its status was changed in 1946 to Trust Territory under the United Nations, and in 1961 became a republic. The population belongs to two main tribal groups, the Bahutu and the Watusi. At present, the Government of Rwanda is under military rule, and there is some unrest and rebel activity in the country. Hartmut is in the process of establishing an antenna farm for his various bands. He now uses on 15 metres a HB9CV beam and, on 20 metres, a two-element counter-fed delta loop. He is now working on a six-element logarithmic Yagi for 10 metres. The antennas are sitting on a 12m elevator tower which gives easy access for maintenance work. Contact with the outside world is with a Yaesu FT757GX, a Ten-Tec Omni V and a FL2100 linear. "The house in which we live," writes Hartmut, "is at an elevation of 1500 metres, and we have a beautiful view of the many hills and mountains which cover Rwanda. This is why it is called "the country of the 1000 hills". Unfortunately, we cannot move around freely any more due to the present civil war. The wonderful Akagera National Park in the east is full of mines, and there is occasional shooting. Our only safe route is to the capital Kigali, which is 11km away. My radio licence and my radio activity are the compensations for our local restrictions," concludes Hartmut in his letter. QSL is either direct: Hartmut Gumpert, BP 420 Kigali, Rwanda, Africa, or to his manager: DJ3FW.

Future DX Activity

* Hong Kong. Phil VS6CT will be on 28480kHz on every Saturday and Sunday from 0000 UTC to 0200 UTC in the month of October to give a new country for those who need Hong Kong on this band.
* Rotuma. Bing VK2BCH went back to his beloved Rotuma Island and was active again as 3D2XV. From there he might go to Funafuti (T2) or to Vanuatu (YJ).
* Mt Athos. Ken VK5QW advises that the monk Apollo SV2ASP/A on Mt Athos, was badly injured in a gas cylinder explosion, and will spend probably two months in hospital.
* Revilla Gigedo. XE2FL will sign as XF4I for three weeks starting 20 October from these IOTA islands (NA-030).
* Pacific. The VE7NH/mm proposed visit to Kingmann Reef (KH5K) and to Palmyra Island (KH5) has been postponed until next year.
* Angola. D2ACA may be active again for a short period beginning mid-September. It is said that the equipment used by the Bulgarian DXpedition was left behind, and they trained a local operator named Miranda. Other sources mentioned LZ2DF and UT3VY as possible operators.
* Mozambique. Ken SM7DZZ is active as C9RZZ on 28022 and on 7001kHz.
* Micronesia. The father and son duo, Dwight V63DJ and Chad V63CJ, will be active from Kosrae Island for two years. Look for them around 14190-14220kHz and at around 0800 to 1100 UTC.
* Vietnam. A six-man team of American operators intends to operate from Saigon (Ho Chi Minh City) during November. They intend to be active on all bands on CW and SSB.

Interesting QSOs and QSL Managers

Note: callsign, name, frequency, mode, UTC, month.

5Z4FO-21023,CW-0530,July. QSL to: KB4EKY Curtis P Wyse, PO Box 248, Waxham, NC 28173 USA.

SV8/DJ4LK-14010-CW-0600. QSL to: Roland Hagmann, St Jakobus Str 6, D-7092, Rosenberg, Germany.

OH0BBF-1400-CW-0530-August. QSL to: Erkki Heikinnen, Myskytie 3, SF-05200, Rajamaki, Finland.

LY9IBS-14027-CW-0550-August. QSL to: LY3BS Virgis Matuzevicius Pergales 20, 235300, Panevezys, Lithuania.

9H30Z-14002-CW-0600-August. QSL to: DL1SBR Frank Grossmann, Gottlob Spiesstr 16, D-7123, Sachenheim 1, Germany.

TL8IM Dave-14222-SSB-0615-August. QSL to: AC3D Richard L Gulatsi Jr, 288 Devonshire Road, Devon, PA 19333 USA.

A35IM-14197-SSB-0705-August. QSL to: JA30IN via Bureau.

V63CJ Chad-14224-SSB-1222-August. QSL to: KA3DBN John L Rouse, 2703 Bartlett Ln, Bowie, MD 20715 USA.

KB5TXM/P/KH0 David-21292-SSB-2348-August. QSL to: PO Box 209, Saipan, MP 96950 USA.

6K17WJ Mike-14200-SSB-1103-August. QSL via the HL Bureau.

TG9EO Anibal-14222-SSB-0533-August. QSL to: Anibal Guerra Estrada, Box 10F, Guatemala City, Guatemala.

OY2VO Palle-14190-SSB-0731-August. QSL via the Bureau.

CN12DKH Silvio-14222-SSB-0646-August. QSL to: ARRAM, Box 299, Rabat, Morocco, Africa.

P29PNG George-1422-SSB-0716-August. QSL via the Bureau or PO Box 7089, Goroka, PNG.

HS1CHB John-14182-SSB-1146-August. QSL to: PO Box 1, Bangkok 10900, Thailand.

HI8OMA Oscar-14220-SSB-1049-August. QSL to: PO Box 3272, Santo Domingo, Dominican Republic.

YE0T Han-21205-SSB-0522-September. QSL to: YB0PR Muhammad Faisal Anwar, JI Yahia 1, 61, Jakarta 11540, Indonesia.

RTTY News

Syd VK2SG supplied the following interesting list of RTTY QSOs: HG02JP-14082-1432Z. QSL to: HA0HG * EN50PQ-14088-1544Z. QSL to: UA1ZX * VP2EYF-14085-2233Z. QSL to: KC8JE * EL2FE-14090-2336Z. QSL to: Box 140, Monrovia, Liberia * VK0ZA-14085-1220Z • 3DA0BW-14088-1637Z. QSL to: N5MZH * YS1RS-14089-0509Z. QSL to: Box 792 San Salvador, El Salvador * HZ1AB-14080-1917Z. QSL to: K8PYD * YN1CB-14084-0229Z. QSL to: WX5L * V47RF-14089-0325Z. QSL to: WA2SPL.

From Here and There and Everywhere

* The PY0SK and PY0SR cards, St Peter and St Paul Rocks DXpedition in May, have arrived in Australia courtesy of Austin VK5WO. Austin was one of the direct sponsors of the expedition and has arranged with Karl PS7KM to send to him all the VK QSL cards which did not have sufficient return postage for direct air mailing from Brazil. Karl agreed, and Austin is now in the process of distributing the cards via the local postal system. Thank you Austin in the name of many VKs who needed this card for a new country.
* The Hungarian Amateur Radio Society held its first International Hamfest in the City of Sopron, near the Austrian border. More than 450 radio amateurs attended from most European countries, but there were visitors from the USA and even from Venezuela.

  The special event station VI4HBW made 6692 contacts during the 31 days of operation, with more than 100 different countries. The station received quite a lot of publicity locally and nationally, which augurs well for amateur radio. Incidentally, VI4HBW was not situated on Fraser Island, but in the city of Hervey Bay, about 250km north of Brisbane.
* The latest and final information on the "new" IRCs (International Reply Coupons). Australia Post has now advised all its offices in the Post Office Circular, POC 743, dated August 1991, about the procedure, how to handle the paperwork. The postal employee has to complete return number 330. The type is: General postage. The item code is: G0999, and the value is quoted as $1.20. Just for interest, the full wording in English on the back of the IRC

says: "This coupon is exchangeable in any country of the Universal Postal Union for one or more postage stamps representing the minimum postage for a priority item or an unregistered letter by air to a foreign country." The Australian Post Office sells these coupons at the present for $A1.35. Please make sure when purchasing the coupon that the postal employee date stamps the front of the coupon on the *left-hand side.*

* Received a QSL card with the necessary reply envelope and return postage from Bruce N0ONB. I am now quoting from the letter from Bruce: "I am working on the WAVKCA award and am sorry to say that several VK stations have failed to return a card even though I sent postage. I hope you can find a moment to send me one. I would very much appreciate it." Do you want me to comment? I am ashamed of my VK colleagues who don't QSL. Look up your logs please. Check when you had the contact with Bob N0ONB, dig out his reply envelope from your paper pile and send him his card tomorrow. I have already posted mine.
* Frank VK2QL is not in the best shape these days, and his activity is restricted to about 30 minutes of CW operation per day. Writing about FOC (June *AR)* Frank tells me that he was elected to the First Class CW Operators Club in 1966. Prior to that he became a member of the A1 Operators Club in 1951 and worked more than 190 FOC countries. If you are one of the "oldies" who knows Frank, a few written lines sent to him will not go astray.
* Kiyoko, the Japanese lady with the multitude of Pacific Island callsigns (March 1990 to February 1991) told me that, so far, she sent out more than 30,000 cards to about 12,000 amateurs, but there are still many more cards to attend to.
* Alex 3B8DA informs me that his correct address for QSLs (SAE + return postage for air mail) is: Alex Mootoo, 41 Brown Sequard Ave, Vacoas, Mauritius.
* QSL cards for the recent D2ACA operation must go via LZ2DF and not to the address of the Soviet operators.
* Harry/Herman VK2CCW, also known as DL1RBH, asked me to inform that all QSLs for his last expedition FO0/VK2CCW (July 1991) and 5W1JQ (June 1991) will be sent out during the next two months, as new cards have to be printed as well. Incidentally, the air-mail postage from DL to VK is DM 2:30, which is almost as much as $A2.00.

QSLs Received

Note: W=week; M=month; YR=year; FM=from; MGR=manager and his call; OP=operator and his call.

Direct cards: CP0RCB 94M FM OP), V38PW (6W FM OP), 9Q5TE (5W FM MGR SM0BFJ) PY0SK (3M FM MGR PS7KM), FR5ZU/J (6WQ FM OP = second request). Bureau cards: VK9LF (3YR FM MGR DJ5CQ), AX9LM (3YR FM MGR DJ5CQ), 9N1MM (op Les SP9LJD 1YR FM MGR IK0GRS), 4K0F (1YR 9M from MGR UA0QBO), TI100D (1YR 9M FM MGR TI4SU) 4M5AC (2YR FM MGR YV5AJ).

Thank You

During the two years since I commenced writing this column, I have always been very aware of the goodwill and help of a small circle of amateur radio friends who assisted me in this work. Their letters, notes and comments were always gratefully accepted. I trust you will continue to do so in the future, in your own particular way.

For the assistance received this month I say thank you to the following: VK1ZL, VK2BCH, VK2BEX, VK2DID, VK2DPY, VK2QL, VK2SG, VK4DA, VK4OH, VK5QW, VK5WO, VK5ZN, VK9NS, HA5HR, VE7BS, 9X5HG, and the following publications *QRZ DX, The DX Bulletin* and the *DX News Sheet.*

Good DX and 73. ar

REPEATER LINK

Will McGhie VK6UU @ VK6BBS
21 Waterloo Cr Lesmurdie 6076

Squelch Tails

The receiver sensitivity of your repeater is not the only requirement for readable signals from mobiles and handhelds. Equally important is the performance of the squelch circuit in the repeater's receiver.

The squelch or mute circuit in a repeater is the same as the squelch in your mobile or handheld, but it does one extra task in a repeater. This extra task is to turn on the repeater's transmitter when a signal is detected by the squelch circuit. The squelch in your radio simply turns on the audio amplifier when a signal is received. With the squelch closed the high audio noise level (pink noise) is muted. The reasons why FM receivers have a squelch circuit and AM receivers usually do not is a subject for later discussion.

The difference between a good squelch circuit in a repeater receiver and a poor one can mean the difference between your mobile or handheld signal being readability five and readability one. Mobile signals vary widely in signal strength as received at the repeater's receiver. This signal variation is commonly known as flutter. A good squelch will stay open on a weak fluttery signal with no breaks in the audio and no turning off and on of the repeater's transmitter. Any extra interruptions to the received signal at the repeater only degrade the readability of the signal. A week fluttery signal dropping in and out of the noise is easier to read than one that is being chopped about by the repeater as well.

There is an extra complication with the nature of squelch circuits that are poor in performance. That is the short delay that squelch circuits have in opening, not only in the repeater, but also in your receiver. When a squelch closes on a fluttery signal and then opens on the signal again the opening process is not instant. There is a short delay inherent in the squelch circuit, perhaps only a tenth of a second, but added to this delay is a short delay in turning on the repeater's transmitter again if the repeater's transmitter had dropped out due to the fluttery input signal. To further add to this delay process is the squelch in your receiver having to open again if the repeater's transmitter is turning on and off with the weak incoming signal to the repeater's receiver. The end result of all this is you miss far more of the fluttery signal than you should if the repeater's receiver squelch had stayed open. Sure you would hear a lot of fluttery noise mixed with the wanted audio, but this is much easier to read than a signal being chopped about by the repeater.

A simple solution to stop the repeater squelch from closing too quickly on a fluttery signal is to build in a delay. This delay is inherent in a squelch circuit, anyway, in the form of a capacitor, but is normally short in duration. It is the burst of noise you hear when a signal you are monitoring stops transmitting. Increasing this delay in the repeater's receiver is simple - just increase the value of this capacitor. There is a trade-off however, and that is the burst of noise that is now heard at the end of each over. A fraction of a second is okay, but a second of noise every over becomes annoying.

The solution has been around in some commercial FM radios for several years: a proportional squelch. This clever idea adjusts the length of the squelch tail to suit the received signal strength. Strong signals have almost no squelch tail, and progressively weaker signals longer squelch tails. Up to now I know of no amateur FM receivers to have such a refinement. I also doubt if there are many amateur repeaters that have a proportional squelch.

It is possible to build into your existing repeater a simple proportional squelch that will greatly increase the performance of your repeater's weak signal handling ability. Such a simple circuit has been added to several repeaters in VK6 with excellent results. The squelch was modified so that strong signals have no noise tail, just a faint click on closing,

and weak signals (below half a μV) about half a second.

Provided the squelch in your repeater is sensitive and stable in terms of temperature and supply voltage, the addition of a proportional mute should improve the reception of weak fluttery signals.

Next edition of "Repeater Link" will have detailed information on how to modify your repeater's squelch. Put simply, a second squelch circuit is constructed, the input of which is connected to the high pass output of the audio line. This second squelch is then adjusted to have a sensitivity of about half a microvolt. The output of this second squelch then switches in, on signals below half a microvolt, an extra delay capacitor into the main squelch.

ICs are available that can replace your repeater squelch and provide inbuilt proportional squelch, but this modification requires considerable changes to your repeater.

One final thought on squelch circuits. Most of these circuits have hysteresis, which means a stronger signal is needed to open the squelch than is required to close it. I understand the reasoning behind the idea of hysteresis, but have always found that a repeater receiver works better with little hysteresis. You may find, as I have, that reducing the hysteresis in the squelch circuit results in a better repeater receiver.

ar

SPOTLIGHT ON SWLING

BY ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

The history of the world altered irrevocably on 19 August when there was an attempted coup d'etat in Moscow. The first inkling I had on the radio that something was amiss was the World Services of Radio Moscow suddenly reverting to playing heavy classical music around 0300 UTC. I tuned to the BBC World Service at 0400 for its Newsdesk, and the announcer quoted a TASS report that President Gorbachev had been replaced due to health reasons and that a state of emergency had been declared across the USSR.

I quickly returned to Radio Moscow and there was a female announcer reading out the emergency decree. More heavy classical music followed. The other interesting fact was that all the Russian domestic programming originating from Moscow was carrying a common program, with a similar format to that of the World Service. That is, heavy doses of classical music, interspersed with frequent announcements. However, I found that the BBC World Service had pre-empted its normal programming to concentrate exclusively on the dramatic developments in Moscow. I was, therefore, able to follow what was happening via that station.

I was inwardly kicking myself, as I had done one term in Russian at the Adult Education, but had not gone ahead with it, concentrating instead on the Novice Class put on by our local W1A branch, which was held on the same night. Whilst attending the class, I met a Soviet exchange teacher who visited Tasmania. She gave the class a valuable insight into what was happening within the Russian Federation. The domestic economy had virtually ground to a halt and most blamed Gorbachev. So I wasn't surprised that there was a reaction.

That night, I found the TASS newsagency had reactivated its RTTY feeder on 14700kHz LSB on 425/50R. The copy was 14 pages in length and consisted of a translation of the state of emergency decree and the justification for it. I fully expected the reimposition of the jammers to block out Western broadcasters, but it never eventuated.

On Tuesday, slowly the normal non-controversial programming was reintroduced to the World Service, but I did note that a few foreign languages seemed to be absent, although the carriers were present. The announcers seemed stilted and confused. One could detect the tension in their voices. By this time, resistance to the coup had intensified dramatically. News of developments within Moscow came primarily from the BBC and nothing from Radio Moscow World Service. But the excellent reports over the ABC Radio from Monica Attard in the turmoil gave more background and detail than many other broadcasters.

On the Wednesday morning, the dramatic events around the Russian parliament close to the American Embassy were brought by the BBC World Service. The TV news showed an Icom transceiver in operation from the Russian parliament building. Later it was confirmed that communication was maintained with Leningrad and other Russian cities around 14175kHz utilising non-amateur callsigns. These were interspersed with relays of Radio Russy - the Yeltsin-controlled station. I personally didn't observe it, yet many VK hams did.

By about 1200 UTC, it was apparent the coup was coming unstuck. The Russian parliament had met in emergency session and Yeltsin announced the coup plotters had fled to one of Moscow's airports, and he had ordered their immediate arrest. Pro-coup troops left the radio stations hurriedly, and other points around the city to barracks. Radio Moscow tentatively started to broadcast foreign reaction to the coup and the decrees from the Russian parliament, asserting Russian sovereignty etc. Around 1500 they broadcast an apology, and stated they were under duress during the coup. By now, Gorbachev had been freed from captivity in the Crimea and the coup was over.

Yet things within the USSR had altered significantly. Clearly the failure of the coup was due to the stiffening resolve of the Russian and other Soviet citizens to be free of the Communist dictatorship. Gorbachev returned but never regained the power and influence he had prior to 19 August. The Communist Party has been banned within the USSR for its complicity in the coup, and the individual republics have asserted their sovereignty, with the majority declaring their independence of the Soviet Union, now practically defunct. The three Baltic republics of Latvia, Lithuania and Estonia have won their independence after 51 years, and have won diplomatic recognition from the international community.

In the days ahead, listening to the radio stations from the various republics will be interesting, and some republics will be establishing their own external services. The dominant Russian Federation has already put Radio Russy on-air 24 hours a day. It is easily heard on 15630 and 15750 USB plus within the normal broadcasting allocations. The "Mayak" program has seemingly disappeared, perhaps forever. Their distinct interval signal of the first few bars of *Moscow Nights* was heard practically around the clock on shortwave.

What of Radio Moscow World Service? Probably it will reflect the Russian Republic's viewpoint and could be interesting in the future. They certainly have lost credibility with their audience, and it may alter or change their format.

Certainly the days ahead will have their trauma for the former Soviet Union, and I'm sure that shortwave will continue to yield its surprises in the future. Until next month, keep listening and good luck! DE VK7RH.

ar

Have you advised DoTC of your new address?

POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST BRIGHT 3741

The Copperhead Keyer Paddle

Originally by Charles D Rakes KI5AZ (from 73 *Amateur Radio Today* May 1991)

A few years ago there were a few circuits of this type doing the rounds. I even built one of them and made modifications which consisted of taking out a piece at a time until the thing stopped working, then putting the last piece back in. I seem to remember that I ended up with only two transistors and it still worked!

This circuit was sent to me by Graham Thornton VK3IY a few months ago, so I finally built this one too, and, not only does it work okay, but I have plenty of the ICs which I remember picking up at Ballarat Hamvention by the tubeful. "So, what's this to me," you say. Well I thought it would be a good idea if I could make it easier by supplying some of the parts, seeing that I'll never use the things myself, so I bought a bunch of IC sockets, and 10 meg resistors, because they are not usually in one's junk box, so I can supply the first 28 people with the IC, a socket and 8x10meg resistors, just to make it a bit easier collecting all the bits. So, if you want those parts, just write to me enclosing $5 and I'll post them to you.

The Copperhead Keyer was especially designed for the home project builder who can take advantage of a few simple skills and fabricate a useful piece of equipment for a fraction of the cost of a similar commercial item. If you are a good parts scrounger, you can probably build your own version for less than $10.

The paddles will operate with most commercial and home-constructed electronic keyer circuits using the Curtis chip, including the built-in versions in many current transceivers.

How it Works

Take a look at the keyer's schematic diagram and you'll see just how easily electronics can replace a mechanical design. Also notice that an on/off switch is not used or required because the standby current is so minuscule. The battery could survive in standby for its normal shelf life.I could not measure the standby current with my digital meter, so it is less than one microamp; the current increases to 0.19mA with one transistor switched on, and 0.38mA with both on.

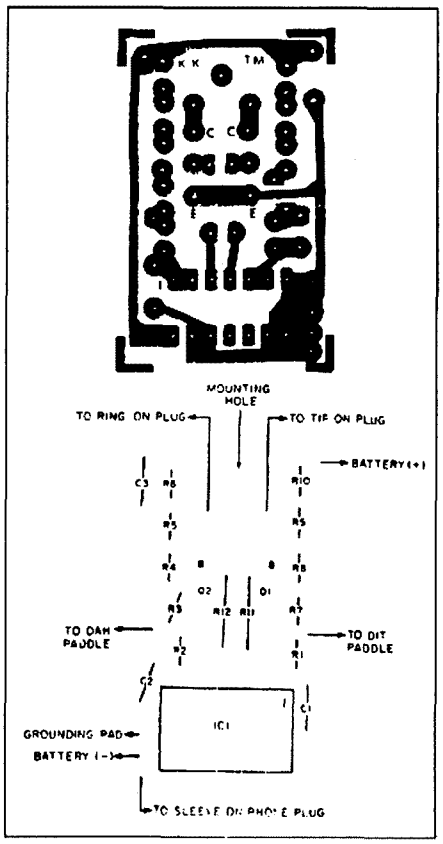
A single 4093 CMOS quad two-input NAND Schmitt trigger IC and two 2N3904 (I used two BC548s) transistors control and direct the circuit's electron flow. The two unused NAND gates are electrically stabilised by tying their gates to earth. The keyed output is fed through a mini or standard quarter-inch phone plug to mate up with the majority of electronic keyers.

The left paddle is connected to the input of gate "A" through a 100k resistor, and back to battery positive through four series 10megohm resistors. The very small current flow through the 40meg resistor string holds the input high. In standby the gate's output, pin #3 is low. When the paddle is bridged, through your skin resistance, to circuit ground, the gate's output goes positive, turning Q1 on. Q1's collector switches any positive load connected to the tip of the phone plug to ground, holding it there until the ground bridge is broken at the paddle. The right paddle operates in a like manner, with Q2 doing the output switching. The inputs of both gates are RF-bypassed with a 39pF capacitor.

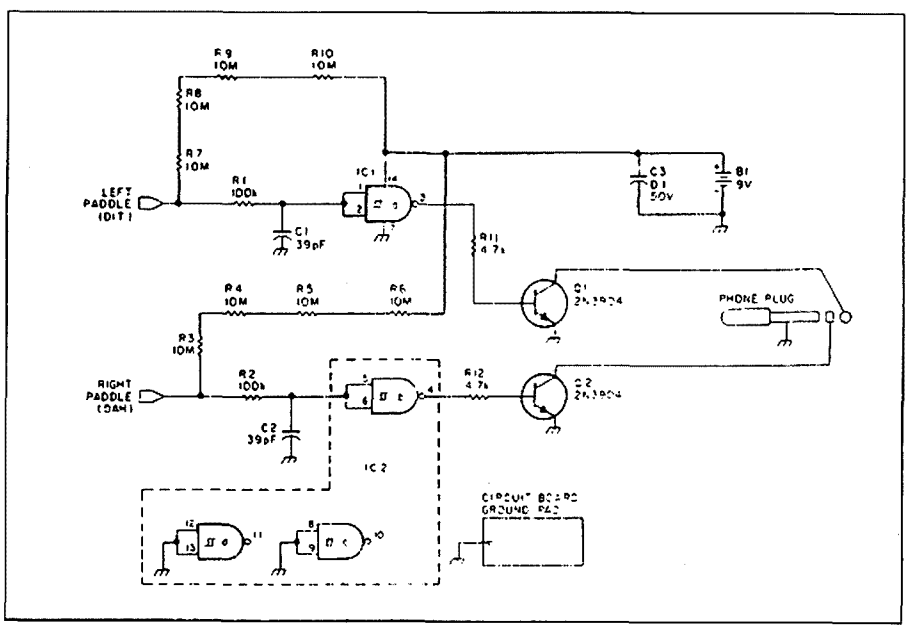
I built my version on a piece of veroboard of 1" by 2", but you may like to use the pattern in the diagram to make a proper board. The article (as received by me) has details for building a paddle using copperclad board, but to save space I have left those details out. You will need to provide a grounded rest for your hand to sit upon so the circuit can ground straight through your hand from the paddle contacts, but otherwise you can design your own paddles. If you have a good idea, write and let me know so we can share it. *(The unique feature of the Copperhead Keyer is the total absence of mechanical action; electrical conductivity provides the keying. - Ed).*

Parts List

B1	9-volt battery
C1, C2	39pF ceramic disc capacitor
C3	0.1µF ceramic disc capacitor
IC-1*	4093 Quad 2-input NAND Schmitt trigger
Q1, Q2	2N3904 NPN transistors (BC548 works too)
R1, R2	100k, quarter-watt resistors



Layout of the Copperhead Keyer - Courtesy 73 magazine.



The Copperhead Keyer circuit - Courtesy 73 Magazine.

R3-R10*	10megohm quarter-watt resistors
R11, R12	4k7 resistors
Phone plug	standard quarter-inch stereo plug
IC socket*	

Items marked "*" available from me for $5 including post and packing.

Did you know, it is possible to solder a three-pin transistor in five wrong ways before getting it right?

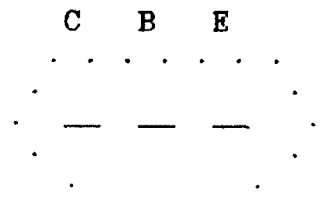
Here is a little something downloaded from my local BBS on Packet; there were plenty more, so maybe I'll print one or two each month.

Dear Sirs and Madams

I would never have thought I would have been drawn into this debate about Morse. Having sat for the exam and passed, I would like to see others do the same thing to get the privileges I enjoy, not to lacko out and get them the easy way. What sort of hobby is it if we have to make it easy for those people with no dedication or commitment to get what they want from it?

I say that Morse should be retained for extended or HF privileges, even if it is just to keep wimps off the lower frequencies.

Pin connections on my BC548 transistors (yours could be different).



73s
GIL
ar

WICEN

PETER TYERS VK3KTS
DEPUTY CO-ORDINATOR WICEN GVBR
25 LOTUS CRES MULGRAVE 3170

Great Victorian Bike Ride 1991

Amateurs are invited to participate in the WICEN exercise associated with the 1991 Great Victorian Bike Ride from Stawell to Melbourne.

WICEN has again been asked to provide safety and logistics communications during the period 30 November to 8 December. The route will be from Stawell via Lake Fyans, Dunkeld, Port Fairy, Port Campbell, Apollo Bay and Bacchus Marsh to Melbourne.

A friendly and relaxing atmosphere plus meals, travel allowance and a chance to test and improve your operating skills and equipment are offered to any amateurs who would like to participate.

Should any amateurs care to join in the activity, they should complete both WICEN and Bike Vic registration forms, available from the address given below. In order to meet Bike Victoria requirements, it would be most convenient if this could be done before 30 October. It is planned that mailings of information about routes, accommodation, standing orders will be made to volunteers as soon as possible after that date.

If you have any queries or if you know of anybody who would like to be involved but has not received a registration form, please telephone Ron VK3ECV (050 23 2027, or Peter VK3KTS (03) 541 6794 [BH], (03) 546 4830 [AH].

FOR RON PERRY VK3ECV
RIDE WICEN CO-ORDINATOR
ar

EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

By the time you read this the WIA Exam Service will be ready to accept applications for accreditation as examiners, and will be almost ready to supply examination materials to examiners. Bill Roper has been working long hours and up to seven days a week to ensure the success of the system. Input has been sought and received from a considerable number of persons, both WIA members and non-members, several of whom have also assisted with the preparation of examination materials. The thanks of the WIA go to all these helpers.

This venture of the WIA will be no different from most of the previous ventures. However well prepared and planned, and however successful the final result, the voices that will be first raised and loudest will be those of the "knockers". It is much easier to criticise than construct. Unfortunately, those who are pleased with a system rarely shout their pleasure from the rooftops. They are too busy getting on with the job and making the system work.

The knockers also have very selective memories. This has been instanced most recently by the cries of "Why weren't we consulted?" when the WIA announced the agreement with DoTC to administer examinations. Those who talked of secret deals, takeovers, lack of member input and high-handedness by "the Feds" have conveniently forgotten that in 1986-7 the whole membership was extensively consulted and questioned on its views on devolvement, and that the system which is now being established is the one which was proposed and supported at the 1987 Federal Convention.

There are some points to remember when considering the protocol being established by WIA Exam Service. Although DoTC has devolved the administration of the examinations to the Federal body of the WIA, DoTC is still ultimately responsible for all aspects of all procedures leading to the issuing of the Certificates of Proficiency and Licences. So the WIA Exam Service procedures have had to include the security controls, maintenance of standards and accessibility specified by DoTC. In the resolution of any possible conflicts, DoTC will be the final arbiter. In accepting the responsibility of administering the examinations, the WIA has been motivated solely by its commitment to providing service to present and potential radio amateurs.

I am one who is prepared to "shout from the rooftops" that the new system is going to work, and work well. I have seen much of the hard work that has gone into the planning and preparation, and am confident that Australia will now have an efficient, effective and equitable "user friendly" examination system, run by amateurs for amateurs. This is the biggest task that the Federal body of the WIA has ever taken on. It has the potential to be the biggest boost to amateur radio for years.

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Amateur Radio Helping our Community

ALARA

Dorothy Bishop VK2DDB
153A Galston Rd Hornsby Heights 2077

On Saturday 27 July, VK5 ALARA members helped celebrate ALARA's birthday by operating a special event station, VK5WI, at a Hobbies and Crafts fair. Amateur radio was featured on the stage, and members of the WIA arranged a comprehensive working and static display of all aspects of amateur radio. Denise VK5YL, Meg VK5AOV, Christine VK5CTY, Myrna VK5YW and Paddy VK5ZYB worked shifts, operating on 20m. They wish to thank those who gave them a contact and thereby helped to promote our hobby.

The VK3 members celebrated ALARA's 16th birthday with a luncheon on 28 July. The happy group of nine YLs and three OMs met at the QTH of Raedie. They had a wonderful time talking, laughing and reminiscing. Best wishes were received from our president, Maria VK5BMT/6, and apologies from other members travelling in VK6 and VK8, were read out. It was very funny when the census man came - someone suggested they all sleep there the night.

Thank you Raedie for your hospitality.

Val VK4VR accompanied her OM Brian VK4RX to Melbourne recently. In between the lovely shopping trips and having fun riding on the trains and trams, she met with as many VK3 YLs as possible. She even ventured to Rosebud to visit Bron VK3DYF. Our youngest VK member, Cathleen Walters, lives in VK3 so Val delivered her ALARA badge to her Dad who works in the city. We heard that when the badge arrived home that night, Cathleen's smile stretched from ear to ear. It's her 11th birthday this month. Happy birthday Cathleen!

Christine VK5CTY has a very talented family. Her new son-in-law has just won a trip to France by playing a computer game. It was not just any computer game, it was about marketing strategy, and he is part of a team. In September/October, with wives by their sides, they will be competing against teams from all over the world. We are wondering what the prize will be for the winners of that game!

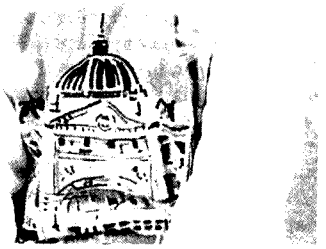
Christine also has a talented daughter-in-law Trish, or maybe Trish's dog is very easy going! Trish decided to take her dog, Toby, to obedience classes to gain CD (companion dog) grading. At the trials, a pass is 170 out of 200, and at Toby's first class he got 192. Naturally, with that score, he came first.

Congratulations to our VK3 YLs who popped over the border to win prizes in the handcraft section at the Adelaide Show. Gwen VK3DYL, Barbara VK3BYK and her daughter Alison almost swept the prize table clean and, from reports I've heard, they really deserved it. I know many of us do handcrafts, knitting etc while playing radio - I was caught mending socks whilst participating in the ALARA contest last year! Thank goodness they are all friends.

Speaking of the ALARA contest, it is on next month so it is time to get the Morse key out and have a little practice. We are really begging for any/every Australian YL (not necessarily an ALARA member) who does not have a full call to try for the Florence McKenzie CW Trophy. Full calls are not "off the hook", you can give the novices and K-calls a contact (and points) on Morse, and OMs can tool Experienced operators would be very happy to slow down or repeat their report if only you'll have a go! Minimum score is 50 points and, with double points for CW, that is very easy to reach.

JOTA will be held on 19 and 20 October so I hope to hear some YL activity. Last year my OM John VK2ZOI helped at one of our local Scout clubs, and during a Wicen exercise last month we were asked why did we favour the Scouts and pay no attention to the Guides. We just did not think; but, on the other hand, they did not approach the radio club either. Anyway, I'll see if I can help them this year. I met some Scout stations in the RD contest and thought that was a great idea for mike practice. In most cases it was not just number crunching, but sharing a little about location and weather.

During November, listen out for five YLs on a YL DXpedition to the British Virgin Islands. The YLs are: Elizabeth VE7YL, Flo KU7F, Mary Lou NM7N, Alice N4DDK and Nellie XE1CI. They plan to be there 11-17 November, then be in Granada for a week from 18



Cathleen Walters, our youngest VK ALARA member.

Norma Watson VK6PNS

Operators at the Hobbies and Craft Fair 27/7/91 (L to R): Denise VK5YL, Meg VK5AOV, Myrna VK5YW and Christine VK5CTY.

November. The islands won't know what hit them! It should be a lot of fun.

We have the results of the 1991 Dutch Midwintercontest, and some of our DX ALARA members did very well. DJ1TE Christa, DL3LG Sigrid and VE7YL Elizabeth were country winners, with Elizabeth also country winner in the CW section. G4EZI Diana and DF2SL Amy, although not country winners, did very well. The next Midwintercontest will be held Saturday and Sunday 11 and 12 January 1992. If you are interested in the rules, please ask our contest manager, Marilyn VK3DMS. This contest is open to OMs too. There is also a special award this year to celebrate the 10th year 88-Award. All that DX YLs need is eight contacts with Dutch YLs. Each contact is worth 11 points, and 88 points are all that are needed. Contacts between 9 May and 31 December 1991 are valid, and a certified log is needed. For further particulars, ask Marilyn VK3DMS.

Maxie DJ4YL is visiting Australia with her sister from 15 September to 30 October. We are not sure if she will take out a VK callsign, but if you hear her on air, please make her welcome.

Welcome to new members Pam VK3EYL who joined at our Dubbo Alarameet, Lyn VK4LLB, Sue VK7NRG, Bev VK4NBC, Robin VK4PRL, Norma VK6PNS, Jennifer VK2NSW and Joy, XYL of VK2EZD. Also welcome back to Judy VK3NYL who we hear regularly on the ALARA net. Just looking at your callsigns prompts me to say - don't forget to try for the Florence McKenzie CW Trophy in our very friendly ALARA Contest!

33/73/88 Dorothy VK2DDB
ar

VK3s (sitting L to R): Raedie Fowler, Jessie VK3VAN, Bron VK3DYF, Robin VK3ENX, Mavis VK3KS, Erika VK3AEB, Muriel May, Phyl VK3KYL and (standing) Gwen VK3DYL.

FTAC NOTES

John Martin VK3ZJC
FTAC Chairman

New VHF Records

There are five new 6m records this month, three of which are for long path contacts. Long path records have not been accepted in the past, as it was my belief that they were not accepted internationally. However, I stand corrected on this and am happy to confirm these new records:

National Record:	VK3OT	TO	9Q5EE	06/04/91	27186km
VK1 Record:	VK1RX	to	KP4A	08/04/91	16082km
VK2 Record:	VK2BBR	to	6W1QC	02/03/91	21384km
VK4 Record:	VK4ZAZ	to	6W1QC	02/03/91	21741km
Mobile Record:	VK2ZAZ/M	to	FM5WD	06/04/01	16243km

Congratulations to all concerned, especially to Steve VK3OT for his new national record.

50MHz Beacons: Comments PLEASE

Only one response has been received so far to the proposal for 50MHz beacons in the eastern states. This is surprising as I would have thought the issue was an important and pressing one. Time is running short and it is intended to resolve this question at the Federal Council meeting in October.

Briefly, the suggestion is to allot extra frequencies in the DX window, giving preference to frequencies between 50.053 and 50.063MHz. The number of channels available is strictly limited and it is proposed at this stage to limit 50MHz beacons to one each in VK3 and VK7, and two each in VK1/2 and VK4. This means that six channels will be earmarked. One of these is already in use by VK3SIX, and a second has been earmarked for a beacon in the Hobart area which should have begun trial operation by the time you read this.

If there are any objections to this proposal, or any better suggestions, please write. There is no point in waiting until the decision is made and then complaining about it!

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INTRUDER WATCH

Gordon Loveday VK4KAL
Federal Intruder Watch Co-ordinator
Aviemore Rubyvale 4702

The biggest offender to our band is the USSR, and the offences are primarily from the fixed services, ie military or naval. The traffic is to sea-going vessels, in either the Baltic or northern Pacific. In general, USSR transmitters are notorious for "spurs" and generating third harmonics which far exceed the international agreed standards. USSR transmitters have been estimated to exceed this level by as much as 50 times. They seem to prefer "brute force power" to efficiency; this being so, they must have a bunch of inferior technicians, it seems. How do we remedy this? By getting the SWLs to make negative comments along with their reports? Always tune their signals in from the lower frequency in LSB mode, regardless of the amateur band frequency; this makes it easier to measure the shift on F1B (RTTY), noting that the higher frequency is the "mark".

Remember to leave a three-second break between overs when using a repeater

IARUMS Summary July 1991

Date	Time U/TC	Frequency in MHz 'M' or 'E'	Callsign if Heard	Mode	RST	Logs X	Details of Traffic if Known Any other Information
190791	1035	7008	-	J3E		2	B/C Asian tfc
2707	1316	7012	-	A3E		2	B/c E. Europe or USSR
1207	1225	7013	-	A3E		5	B/C Asian music only
110791	1120	7018		J3E		2	2-way QSO Asian
mni	0001+	14023.5		F1b	S5:9	73	250Hz shift heard 12 hrs
mni	0540+	14045/8		J3e/L	S4	63	Rad tele Asian duplex SSB??
mni	0648+	14058		AC3	S9	65	Fax ch Helschreiber
050791	1030	14070	VNF	A1a	S9	2	Calling VPO & VBX (20obs)
2606+	0855+	14074/5	VRQ	A1a	S9	54	Viet newsagency
1207	1400	14080/5	VRQ	A1a	S5	37	+14200 KFB hrd 11 times on freq
2606+	0800+	14090/8	VPC	A1a	S6	11	Traffic out (fig & ltrs)
2606+	0930+	14100	NZB	A1a	S7	20	also on 14098/104 tfc both ways
2507	2345	14118	????	multi	S9+20	4++	Jammer?? 50Hz solid-NW Brisbane
02+0791	0245	14123	A3j		S9		US, voices talking about oil#
250691	055	14140.5	UMS	F1b	S7	10	250Hz USSR (not hrd much/in our winter mths
mni	1015+	14165	5PP	A1a	S5	6	15min calls FH6 de5PP QRK K
mni	0545+	14170.5	UMS	F1b	S6	61	250Hz USSR Moscow Naval
2706+	mni	14212.5		F1b	S9	27	2ch NOT F7b 1000Hz shift
0107+	mni	14215	HA7	A1a	S7	20	Z5Z de HA7 also uses RTTY
240691	0515+	14217.5	??	F1b	S6	11	Possibly UMS 500Hz hrd 7hrs
0207	2140	14245		A3e	S9		B/cast from Ch
020691	0954	18070		A3j	S6	3	Military, either India/SriLanka
0307	2321	18075		A3e	S5	1	B/cast, possibly Chinese
0407	0200	21032	UMS	F1b	S6	8	Not hrd much in our winter
250691	0600	21115	CQ5	A1a	S6	28	Ltrs, figs
250691	0910	21355	R Mosc	mxd	S6	35	Complex listed as in CHITA USSR

This is a persistent intruder, as are those operatingin the 28-29.7MHz band. Most appear to be either Chinese or Russian origin.

My thanks this month to VKs 2GDF, 3DVT, 4AKX, 4BTW, 4BHJ, 4BXC, 4CAS, 4EKA,5TL, 6RO, 6XW and VK6BWI. Late arrivals will be mentioned in next month's summary.

73, VK4KAL
ar

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. The information given below has been supplied to the WIA free of charge by Thornton Publishing. Your divisional library may have copies of the references quoted.

Amplifiers

More about transistor amps. Peter Phillips, *EA* vol 53 No 8 August 1991 pp 56 - 60. il ccts, diags and graph. An elementary treatment which discusses common collector (emitter follower) transistor circuits and FETS. The various types of MOSFETS are distinguished.

Antennas

Mechanical Details

A Light and Sturdy Quad for 10 and 15 Meters. Kevin Wellenius KA3PDM and Bjorn Wellenius W3/CE3VU, *QST* vol LXXV No 7 July 1991 pp 30 - 32. il diags and photos. A practical construction guide is given using GRP fishing poles as spreaders. Element spacing is 4'8".

Miscellaneous

A Simple, Effective Dual-Band Inverted-L Antenna. Dennis Monticelli AE6C, *QST* vol LXXV No 7 July 1991 pp 38 - 41. il cct, diags and graphs. A design for a low band antenna is given, of total length 3/8 and 3/4λ A simple ATU is described to match the antenna to 50Ω.

Feeding Dipole Antennas. James W ('Rus') Healy NJ2L, *QST* vol LXXV No 7 July 1991 pp 22 - 24. il photos. A general dissertation on methods of feeding dipole antennas is given, including consideration of open wire lines and coaxial cable. Three designs of coaxial choke-baluns for eliminating coaxial outer currents are described.

Top Band - A Challenge. Peter Botha ZS4PB, *RadZS* vol 45 No 6 June 1991 p 6. il diags. A brief dissertation on four different antenna systems for use on 160m is given.

160-Meter Antennas. John S Belrose VE2CV, *QST* (Technical Correspondence) vol LXXV No 7 July 1001 pp 49 - 50. il diag and graphs. Azimuthal and vertical polar diagrams are presented and discussed for two inverted-L and one T antenna.

Multiband

The Megaloop. Stan Gibilsco W1GV, *73* issue #370 July 1991 pp 29 - 30, 44. il diags. A report on experiments with a long wire 880 feet long, and a 3600 foot horizontal loop is given. Such antennas are frequency insensitive. One virtue claimed is freedom from fading, due to the large area occupied by the antenna.

VHF/UHF

Antennas by the Yard. Ruston Cable WA6TLK, *73* issue #370 July 1991 pp 22, 24. il photos. A length of steel tape measure is used as a flexible and more efficient antenna than a rubber ducky. Detailed construction information is included.

Build a Portable Ground Plane Antenna. Zack Lau KH6CP/1, *QST* vol LXXV No 7 July 1991 pp 33 - 34. il photos. Details for the construction of a ground plane antenna for 146, 223 and 440 MHz are given. The design

is intended to improve the performance of hand held transceivers which normally use a rubber ducky.

Amateur Television

Micro ATV Transmitter. Mike Henkoski KC6CCC, *73* issue #370 July 1991 pp 9 - 10, 12. il cct, cmps, pcbs and photos. A 100mW 434 MHz video transmitter is described. The unit is based on a Surface Acoustic Wave monolithic oscillator supplied by RF Monolithics Inc of Dallas Texas. SMD technology is used in the construction. Suggested applications include remote control model aircraft TV and a 'Lookie-talkie'.

SSTV with the Robot 1200C Scan Converter and the Martin Emmerson EPROM Version 4.0. (Product Review) Dick Goodman WA3USG, *73* issue #370 July 1991 pp 46 - 48. il photos. A review of the performance of Robot 1200C, manufactured by Robot Research of San Diego California, when modified by a Martin Emmerson EPROM Ver 4.0 is presented. The Eprom is manufactured by Martin Emmerson G3OQD of Hayes, Bromley, Kent.

The ATV-3 Downconverter. Dave Pelaez AH2AR/8, *73* issue #370 July 1991 p 50. A description of the assembly and operation of a kit manufactured by Communication Concepts Inc Xenia Ohio is given. The unit is inserted between a 70 cm antenna and a TV set. It can tune the entire 70 cm ATV band.

The VOR-2 Video Operated Relay. (Product Review) Dick Goodman WA3USG, *73* issue #370 July 1991 pp 26, 28. il photo. A review of a video operated relay board manufactured by PC Electronics of Arcadia California. The device is used as a carrier operated switch for ATV repeaters.

Computers

Hardware

Improved Serial I/O Interface for PCs - 2. Jim Rowe VK2ZLO, *EA* vol 53 No 8 Aug 1991 pp 82 - 84, 110. il ccts, cmps, diag, pcbs and photos. This concluding part of the article describes in detail the design of opto-isolator input buffers, relay output driver circuits and triac output drivers. Software programs are included for testing the system and for simple applications.

Software

Software for the Hamshack, Part III. Bill Clarke WA4BLC *73* issue #370 July 1991 pp 42, 44. This part adds programs to calculate radio distance to the horizon for a given antenna height, and to portray colour codes for a selected resistor.

Electronic Devices

Audio Alarms

Experimenting with Electronics 1 - Simple Siren. Peter Murtagh, *EA* vol 53 No 8 Aug 1991 pp 103 - 105. cct, cmp, pcb and photo. A simple two transistor circuit acts as a wailer, which can be adjusted to sound like an air-raid siren or a police siren.

Automotive

Hall Effect Speed Sensor. Jeff Monegal, *EA* vol 53 No 8 August 1991 pp 62 - 64. il cct, diag, graph, pcb and photo. A Hall effect sensor is used to measure the rotational speed of an automotive tailshaft, as an alternative to the pick-up coil previously described by the same author. The magnets are mounted diametrically opposite on the tailshaft with reverse polarity. The circuit output provides a series of positive spikes, whose rate is proportional to the vehicle speed.

Programmable Trip Meter. Jeff Monegal, *EA* vol 53 No 8 Aug 1991 pp 94 - 99, 107. il ccts, cmps, diags and photos. The construction details are given for a device which gives a digital display of distance covered, analogous to an odometer. However, this equipment can be set to show the distance remaining as well as the distance travelled.

Telephone Accessories

A Practical and Versatile DTMF Decoder (2). Farrell Segall ZS6RW, *RadZS* vol 45 No 6 June 1991 pp 10 - 12. il cct. The complete circuit is described for a unit which can identify and act on any of 16 two-tone combinations. Either relays or opto-isolated transistors can be used to actuate up to 6 output devices.

Narrow Band Modes

AMTOR Primer. Floyd Stamm ZS5QQ, *RadZS* vol 45 No 6 June 1991 pp 8, 24 - 25. An elementary description of the AMTOR system is given. Most packet TNCs and computer software can be used to handle AMTOR.

Propagation

Tropo Time is Now! Gordon West WB6NOA, *73* issue #370 July 1991 pp 14, 18, 20. il photos. A general discussion is given on the phenomenon of tropospheric ducting. Emphasis is given to the California-Hawaii duct.

Power Supplies

DC-DC Converters

Secrets of Simple DC-DC Converters - 1. Andrew Pierson, *EA* vol 53 No 8 Aug 1991 pp 134 - 136. il cct and graphs. A background analysis is given for the design of blocking oscillators to generate an AC output, prior to rectification and filtering. The criteria for regulation of such a power supply are introduced.

Miscellaneous

Choosing The Right RCD. Peter Foley, *EA* vol 53 No 8 Aug 1991 pp 120 - 122. il ccts, diags, graph and photos. A general discussion is given on the techniques used for commercial models of Residual Current Devices (Earth Leakage Protectors). Both electro-mechanical and electronic devices are described.

Series Regulated

Low Cost 18V/1A Benchtop Supply. Rob Evans, *EA* vol 53 No 8 August 1991 pp 72 - 78. il cct, cmp, diags, graph, pcb and photos. Based on a 723 IC regulator, a complete design is presented which will supply 2.5 - 18V regulated at up to 1 amp load. The load regulation is better than 0.15% at 1A. Line regulation is better than 0.1% between 210 - 260V AC input. The output ripple is less than 1mV at full current output. A current limit is incorporated, which may be switched to either 30mA or 1.2A.

Technology

An Introduction to Digital Signal Processing. Bruce S Hale KB1MW/7, *QST* vol LXXV No 7 July 1991 pp 35 - 37. il cct and graphs. A basic description of Digital Signal Processing is given. Applications such as filtering and the recovery of signal from noise are discussed.

Lightning Protection. Frank A Finger NU1A, *73* issue #370 July 1991 p 32. A general discussion is given on the measures which can be taken to reduce the effect of lightning on antennas and equipment. Emphasis is placed on the value of a sharp pointed rod to discharge an antenna at low voltage.

Transceivers

Microwave

A Single-Board, No-Tune 902-MHz Transverter. Rick Campbell KK7B, *QST* vol LXXV No 7 July 1991 pp 25 - 29. il ccts, cmp, graph and photo. A design is presented for a 902 MHz transverter for use with a 2m rig. Printed band-pass filters are used, with Monolithic Microwave Integrated Circuits.

Product Reviews

Kenwood TS-850S 160 - 10 Meter Transceiver. James W ('Rus') Healy NJ2L, *QST* vol LXXV No 7 July 1991 pp 42 - 46. il graphs and photos. A detailed report is presented; measurements are compared to specifications.

Transmitters

A Different Weave of SSB Exciter. Peter Traneus Anderson KC1HR, *QEX* No 114 Aug 1991 pp 3 - 9. il ccts and graphs. A design for a 75m SSB exciter is given which uses the Weaver method of SSB generation by phasing; a general theoretical discussion precedes the specific design details.

With the Weaver method, both the suppressed carrier and the unwanted sideband signal fall within the desired passband, eliminating spurious emissions. The unwanted signals require less attenuation for satisfactory communication than other methods of SSB generation. It is claimed that modern components, such as switched capacitor filters, now make this approach to SSB generation

more practical.

Glossary of Abbreviations

il The article contains illustrations, a list of which follows.

cct A circuit diagram

cmp A component layout drawing

EA Electronics Australia

diag A mechanical drawing

pcb A master drawing from which printed circuits may be produced

QSTVE QST Canada

RadCom Radio Communication

RadZS Radio ZS

73 73 Amateur Radio Today

The above items are reproduced from *Amateur Radio Technical Abstracts* Volume 1 1991 ISSN 1036-3025 - to be published.

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DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

New Callbook

The 1991/92 edition will now be available from the Divisional office. Listen to the VK2WI broadcasts for details of member costs and postage. A reminder to clubs that you should make a bulk purchase from the office as a service to your local amateurs. Call the office on (02) 689 2417 12 noon to 1pm weekdays, fax any time (02) 633 1525 or write to PO Box 1066, Parramatta NSW 2124. Cheque or credit card payment. Don't forget that the office also maintains a range of publications from various sources. Now is the time to submit advance orders for next year's *ARRL Handbook* or the international or American callbooks.

The last Trash and Treasure for this year will be on Sunday afternoon, 24 November. It should be noted that items available from the Division at a T&T are not available outside these days. The office receives enquiries after a T&T for some things known to be left. The office staff cannot assist on these lines. The only non-publication lines available from the office are the grab bag series and, sometimes, small components. Trash and Treasures are held at Parramatta in the car park on the last Sunday of the odd-numbered month unless that day is in the middle of a long weekend. As always, the broadcasts will advise.

All 2m Alinco handhelds went in the recent ballot and have now been distributed.

New Members

The following joined the Division during August, and a warm welcome is extended to them.

P	Body	Assoc	Baulkham Hills
S G	Brown	VK2NNB	Hazelbrook
H	DeArmas	Assoc	Guildford
M K	Dudzik	Assoc	Prospect
C	Sara	Assoc	Galston
B	Seymour	VK2PAC	Tumbarumba
M W	Soire	Assoc	Pyrmont
A P	Syuko	Assoc	Seven Hills

5/8 WAVE

ROWLAND BRUCE VK5OU

Once again you have a "President's Report" as Jenny is still overseas at the time of writing. However, she will be back to read this October *AR*. We hope you had a good trip, and all of us look forward to reading your usual column again. Especially me. I don't know how you do it month after month. You obviously have a journalistic flair!

October is the month for JOTA, of course. This year the "Life. Be In It!" event will be held in Bonython Park, and the recently formed North East Radio Group will be operating a station there. I'm sure they would welcome any offers of assistance. Alan VK5ZN and I are planning a visit to them in September as part of the council's policy of getting out to affiliated clubs. We appreciate the invitations, and between us hope that even most remote will see somebody, even if it is only when a council member is in the area on business. I must say, though, that it will probably be next May or June before anyone gets to Alice Springs.

It is probably not too late either for anyone wanting to assist Chuck VK5CQ with the Camp Quality station or with the technology sessions with the campers to give Charles Waite a ring on (08) 414 0105 (that's a pager service, so you will have to ask for Charles, not Chuck!) or Kevin Johnson on (08) 230 9612 (work) to arrange the best time. The dates are 30 September to 4 October inclusive.

Quite a number of people are sitting exams lately. Please note the following amended dates for the rest of 1991 and let anyone you know to be planning to sit them as they probably will not routinely see *AR*.

26 October, 1pm ,WIA SA Division, phone 276 1251

16 November, 10am, Christine Taylor, phone 293 5615

7 December, 1pm, AHARS, phone 276 7091

Also, for the Constructors, the October WIA meeting will be the Members' Equipment night.

And now, an attempt to thank those who did such a good job at the Hobby Fair. First and foremost must come the President of ACBRO, Trevor, and VK5PRM Peter, who supported and arranged the display. Neville VK5XD and Grant VK5ZWI, ALARA - especially Meg and Christine - Southern Cross DX Club, ACBRO itself and the SA ATV Group put in vast amounts of time, and Peter Koen produced his usual excellent display stand. Thank you all, and thank you also to those I have not mentioned by name. I'm sure there will be many of you. Please do not think you are not appreciated, you are! It's just that my memory is not all it should be.

VK6 NOTES

HARRY ATKINSON VK6WZ

Accident insurance for WA Division members whenever engaged in volunteer duties for the Division or for an affiliated club has been secured.

Following several months of discussion and delays, the cover was obtained for accident insurance and also for public risk up to $5,000,000, mainly through the efforts of Trish VK6QL. All this sprang from a renewal notice from the Institute's previous insurers demanding a premium jump from around $800 per annum to $1500 - and, at that, for a less attractive cover.

Council set a budget figure of $1000, plus or minus, and the ultimate deal was settled at 1100 - in the circumstances a satisfactory figure.

Quietly, and with no fuss at all, history has been made in the ranks of the VK6 Morse practice volunteers. For years a totally male preserve, this valuable service now enjoys the presence of a lady, Dianne VK6BC. It would take a good deal of research to list all those amateurs who have benefited from the VK6WIA nightly practice, and who have later volunteered as operators on the roster, and in at least one instance become the "boss man" - the Morse Co-ordinator. It's called giving something back, and is one of the best things that can happen in radio or in any human endeavour. Thank you, Dianne - and thank you gentlemen!

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Support the WIA in order to protect amateur radio frequencies at WARC-92

CLUB CORNER

Air Forces Amateur Radio Net

With permission of the Gold Coast Amateur Radio Society Inc, the Air Forces Amateur Radio Net is holding its Annual Meeting at the gold Coast Hamfest on 9 November.

Registration of members and visitors will be between the hours of 10am ad noon in the foyer of the hamfest and, after a lunch at Jupiter's Casino, the Annual Meeting will be held in the Conference Room above the Hamfest.

Bob Neville VK4ACL, Secretary
AFAR Net
124 Roscommon Road
Boondall 4034

Moorabbin & District Radio Club

Please note that the Moorabbin and District Radio Club has decided to change its meeting nights, effective October.

Beginning on Friday 18 October, the regular monthly general meeting will take place on the third Friday of the month, and the natter night on the first Friday of the month.

The September meeting will be on Friday 6 September as previously arranged. Natter nights will be on 20 September and 4 October.

Allan Doble VK3AMD
Publicity Officer

Riveriand Radio Club

Riverland features in variety club "bash".

At the annual general meeting of the Riverland Amateur Radio Club on 6 June, three retiring members of the committee were re-elected; they were Peter Blades VK5APB, Kingsley Brauer VK5NOU and Doug Tamblyn VK5PDT. Kingsley was re-elected vice president, and Doug re-elected secretary. Adrian Reiman VK5AB was also elected to the committee.

Congratulations to Mike MacIntosh VK5CK on obtaining his full call. Mike was elated when he found out the callsign VK5CK was available.

The callsign holds some significance for Mike because, for some years, he was employed with the ABC radio station 5CK at Port Pirie (SA). Congratulations Mike.

The club has also recently installed six new cavity filters at the 2m voice repeater VK5RLD at Berri, increasing the output by about 1dB.

The Riverland featured in this year's Clipsal SA Variety Club "bush bash" with more than 100 pre-1966 vehicles crossing the finish line at Renmark on Friday afternoon 23 August, after starting at Glenelg on 17 August, then travelling some 3273km through some of the roughest outback roads of the north of SA, NSW and Vic.

A very large crowd of enthusiastic people was there to greet them, especially car 33 - the only Riverland entrant - driven by Barry Fletcher, Chris Vanderwoude and Ivan Smith VK5PAW. Ivan has now been involved in two Variety bush bashes, and each time he has enthusiastically promoted amateur radio. While mobile in the outback of SA, Ivan made contact with a station in Papua New Guinea.

The bash raised a total of $600,000 for disadvantaged and needy children of SA.

The Renmark and Paringa District Hospital received $26,000 for the ear, nose and throat wing of the children's section of the hospital.

The principal of the Riverland Special School at Berri was also presented with a set of keys to a 12-passenger bus, at a dinner in the sport and recreation centre at Renmark on Saturday 24 August, which was attended by 700 people. The Riverland received $56,000 in total.

The Riverland entrant in this year's Clipsal SA Variety Club "Bush Bash". L to R: Chris Vanderwoude, Ivan Smith VK5PAW and Barry Fletcher at the start of the bash at Glenelg.

Gold Coast

The Gold Coast Amateur Radio Society Inc is holding its 14th annual Hamfest in the Albert Waterways Community Centre, Mermaid Waters (just south of Jupiter's Casino) on 9 November 1991.

Doors will be open from 9am-4pm.

Commercial displays, interest groups and the popular bring-and-buy sections will be complemented by door prizes, raffles and refreshments to make this an enjoyable day to catch up with other amateurs.

This year the Air Forces Amateur Radio Net will be holding its Annual General Meeting in the conference room at the Hamfest, so a warm welcome is extended to all ex-service persons to attend this function.

Ed Newman VK4JEN
Secretary
PO Box 588
Southport 4215

Ballarat Amateur Radio Group Hamvention

The Ballarat Amateur Radio Group will hold its annual Hamvention on Sunday 27 October 1991.

This year's venue will be at the Bray Raceway Trotting Track in Bell St, Ballarat, 3km south from the city centre off Skipton St. This year's huge venue is all under cover for displays and car-boot sales, with no space problems. Book your table early to sell your surplus gear.

A full day's entertainment is assured with all the usual displays and fox hunt events, along with a barbecue lunch, free tea and coffee all day, all for $10 per person, children free. On Sunday morning there will be trotting trials at the venue also at no extra cost.

Book your selling space now. Trestles will cost $10, boot sales $5. Make it a great family day. channel 3 (146.750) repeater will be used to help you locate the venue.

For further details or to book space, phone Kevin Σ VK3WN on (053) 35 5011. QTHR.

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Radio Amateurs Old Timers Club

The RAOTC will hold a luncheon, including election of committee, at Bentleigh Club on Wednesday 9 October at 12.30 for 1pm. Cost is $20 per head plus liquid refreshments. Bentleigh Club is located in Yawla St, Bentleigh; Melway's map reference 68 B11.
Allan Doble VK3AMD

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Used Satellite Salesmen

I suppose it had to happen, but I think the evidence is there to show them at work.

May 1991 *AR* p40 lists AO-10 with 5855 orbits on the clock. Three months later, August 1991, p35 lists it with 3234 orbits. Yes, they have started to wind back the odomoter even on satellites.

What does it mean for amateur radio?

DENNIS AVARD VK4ADY
11 JAMES ST LAIDLEY 4341

(Incredible, isn't it, Dennis? I'm sure our satellite experts will be able to find the explanation now they've been shown the problem. Ed)

Recession Victim

My request, although unusual, is genuine. I am seeking to relocate to anywhere(!) including NZ, South Pacific, VK1-8, in order to find suitable employment.

I am a qualified tertiary/TAFE teacher of many years experience, currently employed as an Adult Literacy/Numeracy teacher for Skillshare and LifeSkills lecturer for TAFE here in Whyalla. Full-time, permanent appointments no longer exist in VK5, so I seek some elsewhere. I have no ties and will supply CV, resume, qualifications (PhD, MSc, BSc, Grad Dip Ed and Grad Cert in Aboriginal Studies) and references to any interested parties. Our journal is widely read and my enquiry may lead me to pastures new. Keep up the good work.

DAVID ("DOC") WESCOMBE-DOWN
VK5HP
C/- WHYALLA ARC
PO BOX 444
WHYALLA 5600

PS: I also collect stamps - can you help my collection?

Help Wanted

May I ask (through your pages) for help from other amateurs on a few problems.

1. I need a cure for an annoying wobble in the VFO in my QRP rig, an FT-77S. If the RIT is not on, the frequency can wobble up and down by a couple of hundred Hertz. The central frequency remains as per the dial, but at times the wobble is almost continuous. At other times, the wobbles may not appear for hours.
   Curiously, turning the RIT on causes the wobble to disappear! I feel this may not be a problem in my rig alone. Has anyone else experienced this condition?
2. I need advice about suitable brands of finals for my QRO rig, an FT-102. In Australia, only one or two brands of finals are available, viz GE and Penta. Have any other amateurs used these with success in this rig?
3. I have a home brew 30 amp power supply, which has just developed an annoying audio HUMMMM! I have checked all the usual possibilities, with no real improvement. I suspect that the transformer coils may be vibrating slightly. Has anyone got ideas (other than Araldite!) for curing this annoying noise?

If anyone can help me with these three "problems", I would appreciate a line to the address below. I am not QTHR in the 1991 callbook. I would acknowledge any replies.

RICHARD JENKINS VK1RJ
PO BOX 101 CHARNWOOD ACT 2615

Misunderstanding

(also direct to Doug VK4AVR)

I have just received my copy of September *AR* and was dismayed to read your letter concerning skydivers and the interpretation you had put on a few words. I believe you have taken them out of context.

In no way was the comment a cheap shot at skydivers. I have the highest admiration for them and the care and diligence which they apply to training and caring for their equipment. This includes the fastidious way in which they pack their chutes as, of course, their lives depend on the chute functioning correctly.

If you look closely at the photo you will see that the "chute" used on the payload was tied immediately under the balloons and was not packed. This was the basis of my reference to skydivers and, as previously stated, was not meant to be in any way disrespectful to them. I enjoy watching skydivers perform, and if I had a bit more courage I might be inclined to have a go too. Needless to say, my wife does not share my interest in such things. I have flown in planes with skydivers, so am not unfamiliar with their professional dedication to the sport.

Please convey to those few skydivers you spoke to the real reason for my comments. Perhaps I need next time to be more careful with my choice of words. I certainly didn't set out to offend anyone when I wrote the article.

GEOFF ATKINSON VK3YFA
31 BERRINGA RD NTH RINGWOOD 3134.

Operators Needed

At the end of this year the Scout Association of Australia, Victorian Branch, is hosting the 16th Australian Jamboree at Victoria Park, Ballarat. An amateur radio station is to be set up on site to enable the citizens of the tent city to have an opportunity to see how a radio station works outside of the normal JOTA set-up.

Also Jamborees traditionally have visitors from overseas who arrange schedules back to their home country.

Victoria Park, Ballarat, has been chosen to be the home of over 12,000 people living in a tent city between 2-14 January 1992. Planning is well under way both for feeding and entertaining the Scouts.

But, to run the radio station, operators are required.

I have been asked by the co-ordinator of the amateur radio station to approach the WIA and various radio clubs to gain assistance in running this station.

I am involved in the Scout Radio and Electronic Service Unit and an active member of the Scout Association as an Assistant Cub Scout Leader.

I hope the readers of *Amateur Radio* may be able to help.

I can be contacted by any of the means listed below.

KENT COCHRAN VK3TER
3/556 MORELAND RD WEST BRUNSWICK 3055
(PHONE 384 1610 HOME, 387 5490 WORK, 399 1184 FAX).

We are All Being Counted

Geoff VK2SA and his wife Maralyn were travelling over the Simpson Desert accompanied by four others on a four-wheel-drive holiday.

On 6 and 7 August they were at Dalhousie Springs, which is about 300 miles east of Oodnadatta. It is a beautiful area, with palm trees, hot springs and a fine climate - temperature 35 deg.

Imagine relaxing, miles away from anywhere, no phone, no work etc.

A small speck was seen in the sky. It grew bigger - obviously an aircraft, which landed nearby. Out jumped the pilot and came up to the group to announce that he was doing the census and had the forms for them to fill in.

After waiting for them to do so, he thanked them, bid them g'day ad took off.

Is there anywhere to hide?

PETER CORKERON VK2AGB
3 PRIMROSE PLACE LOTFUT 2232

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr L B J Sutton	L40263
Mr C A Davey	VK3WT
Mr W M Nicholson	VK3AJG
Mr G H Whitehead	VK4NYE
Mr S W D Wilson	VK5ASD
Mr M Bottomley	VK6AML

HAMADS

TRADE ADS

● AMIDON FERROMAGNETIC CORES: For LF/HF/VHF/UHF applications. Sand DL size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office please ... 14 Boanyo Ave, Kiama). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Trusoott Electronics, Melbourne.

● LOGMASTER: Radio logkeeping software $89. CODEMASTER Morse training/proficiency software $49, endorsed by Officers of Signals Schools of Aust Army. Both products include manuals for IBM/clones PC, XT, AT Information Order. Milestone Technologies P/L PO Box 699 Ml Waverley, Victoria, Australia 3149. Ph (03) 807 6767. 8 Greenham Cres, Mt Waverley 3148.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution short-wave weatherfax, Morse & RTTY receiving program. Needs CGA, SSBhf radio & Radfax decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2, but suitable for Hercules, EGA & VGA cards respectively $35. SATFAX is a NOAA, Meteor and GMS weather satellite picture receiving program, uses EGA or VGA modes. Needs EGA or VGA colour monitor and card and WEATHER fax PC card & 137MHz receiver $45. All programs are on 5.25 inch or 3.5 inch disks (state which) and documentation. Add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Old 4005. Ph: (07) 358 2785.

FOR SALE - NSW

● KENWOOD SPEAKER/MICROPHONE SMC-32, never been used. Fits TH-26A and TH-46A. But NOT TR2500 etc. $25. Ph (066) 52 6135 VK2AWA. QTHR.

● KENWOOD SM220 with BS8 option, $300. AT200 $100. MC50 $50. RD300 dummy load $30. Drake TV3300LP low pass filter $20. All PC. Ian VK2CJP QTHR. Ph (02) 44 4985.

● HYGAIN TH3J tribander 20/15/10 3el beam, new, never assembled, $250. Rotator Emotator 103LBX 240 vac new, never used, $250. Craig VK2ACH QTHR. Ph (049) 43 5431.

● CUBICAL QUAD homebrew, two-element duo band 10 and 15m $100. Steve VK2STV (02) 602 2065 QTHR. care VK2MSA.

● ICOM IC-761 Multi function CRT display HF all mode transceiver. Quadruple conversion receiver, 105dB dynamic range, inbuilt ATU and power supply, 150W output and much more. Sacrifice $7500. Genuine buyers only please. John VK2ATU (02) 792 2275.

● FTDX560 YAESU VGC $350. Chmside duoband beam 15-10m $150. Home-brew linear part wired 4/830s 1.5kW pep $180. VK20C (069) 48 5267 AH.

● CRYSTAL SUIT 6M/7MHz converter type D 45.1 MHz miniature HC25 45.000MHz $12 ea Incl post. VK2KSD QTHR.

● YAESU FT207R synthesised 2m handheld (SN: OK120469) with carry case, charger, speaker/mike YM-24A) to suit and 13.V car adapter PA-2) $380. Kenwood TM401A 70cm mobile (SN: 4022060) $360. Apollo UHF CB with mike $300. Apple clone computer "Supercom" with serial and parallel cards, 80 column card, separate keyboard, twin 5-inch drives etc. $300. Noel VK2YXM QTHR. Ph (02) 871 3079.

● SIERRA bi-directional power monitor less plug-in $90. Waveguide attenuator 0-40dB $30. Composite video monitor green screen $40. Two AN/USM105A dual trace oscilloscopes with handbook $100. John (02) 417 5338. 68 Warrane Rd. Willoughby 2066.

● ICOM IC202 with IC3PS power supply and IC20L 10W PEP amplifier satellite xtals fitted and manuals. SN: 22177 $200. Nick VK2AOR QTHR.

FOR SALE - VIC

● AWA FM MARINE hi-hand transceiver (faulty power supply) all valve circuit (comes with tune-up details and circuit diagram). No crystals supplied suitable for 2m FM conversion $30 ono. Vincent VK3AJO QTHR. Ph (03) 872 3503.

● RX R5223 General coverage $100. RX AR7 in pieces, all parts available. Includes 4 coil boxes $100. AWA 50W base station 640 final $50. Vinten MTR 20 mobile 12V complete and works $30. Vinten MTR 13 mobile 12V complete with AC PS $40. Plus freight. Offers may be considered. Contact Neil (053) 459 6445.

● STC MTR 151 hi-band VHF transceiver fully transistorised 10 channs xtal controlled, includes tune-up manual and cct diag etc $35 ono. Needs crystals plus new PA transistors. Vincent VK3AJO QTHR. Ph (03) 872 3503.

● GENERAL ELECTRONICS 600L Linear. No tune. 160, 80, 40, 20, 15, 10. SN: 56356 spare 813 final. Cash and carry $200. Werner Wulf 10Mx 3 element beam. Unused $90. Gil VK3AUI QTHR. Ph (03) 806 2794.

● IBM XTclone 10meg with 5·1/4 drive and 20 meg hard drive 2S/2P/G herc card and monitor $800 ono. Gil VK3CQ QTHR. Ph (057) 55 1158 BH or (057) 55 1124 AH.

● QUAD ANTENNA 20m monobander, aluminium spreaders, cast aluminium hubs, 3m boom wire and insulators $100. VK3AUC (03) 589 2470.

● YAESU FT757MK1 Mic & manual $1000. Kenwood TR9130 2m all mode 25W $500. Kenwood TR9500 70cm all mode 10W $550. Kenwood TS660 quadbander all mode 21, 24, 28 & 50MHz $600. Two National WV-303ON colour video cameras with P/s & manuals $150 ea. Pioneer PC PX-7 MSX computer with manuals $100. TV sync pulse gen equipment, colour PG05 system Astor with h'book $100. Riker Video Indust syn gen & 1501 Video test set (ex Ch0) B/W. With manuals $100. Reel-to-reel TEAC A3440 4ch multi-track tape deck with simul-sync $500. VK3CSJ (03) 792 4500.

● HF ALL BAND hi pwr linear amp, beautifully built 3X811As in GG best offer to $550. Matching 5-band hybrid 100W PEP transmitter VFO control, best offer to $300. Sweep & Marker generator plus circuit & instructions $75. 13.8V (variable) 20A 240V AC commercial power supply, $150 inc manual. VK3AD1 QTHR.AH Ph (03) 882 0020 BH.

● YAESU FT757GX S/N: 4L133092 all mode all band keyer CW filter IF shift-width etc, mic, manuals EC $875. Antenna TET-Emtron triband-wideband, part assembled, manual, GC $300. Ex QTH. VK3UJ NOT QTHR. Ph (03) 728 8879.

● LOG PERIOD Antenna 13-30-8 all bands 10-20m with 2kW balun. Rotator Kenpro KR2000RC brake torque 10,000 kgcm with wedge brake. Both GC. Antenna $450. Rotator cost $1350, sell $600. Morrison VK3BCY QTHR. Ph (056) 89 1205 (03) 877 2597.

● LOTS OF PRE-LOVED EQUIPMENT at the Ballarat Hamvention Sunday 27 October at the Bray Raceway Trotting Track, Bell St, Ballarat. All under cover. Further details phone Kevin VK3WN (053) 35 5011.

● ICOM IC751 HF txvr with mike, manual, original carton, $1700. Yaesu FT290R all mode VHF PC shack use only with Nicads pseaker mike and bracket $510. CB txvr Cobra 148GTL with mike, hardly used $210. Comm rcvr Sony ICF2001 with power supply PC $250. Icom IC-02N HH 140-152MHz speaker mike $340. Yaesu scanner FRG9600 with manual & workhop manual, original carton, PC $770. Yagi 5el beam tribander $450. Yagi 6el beam duobander 10-15m $180. Yagi 3el 10-11 beam new $115. ATU roller coil tuner, 2kW $200. VHF 2m linear input 300mW O/P 40W $105. Monitor Scope YO0-100 PC, as new $320. BWD, CRO dual tracer 35MHz, $650. Home brewer HF linear 1kW PEP 2XQB3/300 and 2 spares $900. All antenna Werner Wulf. Harry VK3AXJ QTHR. Ph (03) 802 5704.

● TOKO hi power HL166V 6m linear $400. Kenpro 250 rotator plus 12m connecting cable $100. Hi Mound telegraph key model HK707 unused $30. Roger VK3XRS (051) 56 8291.

FOR SALE - OLD

● KENWOOD TS600 6m all mode transceiver, EC, no modifications $500 neg. Sold to licensed amateur only. John VK4KK QTHR. Ph (07) 269 6647.

● KENWOOD TS520S txvr with 3 new finals. Kenwood R1000 rx. Kenwood TS440S tcvr with PS50 20amp PS Yaesu FL1000M linear amp, no WARC bands. Sony ICF2001 port Rx. 2 Morse keys. Tandy var PS -5 to +15V Azden comm spkr. George VK4CPL QTHR. Ph (070) 54 1043.

● RF MILLIVOLTMETER probe $25. AC-DC inverter 12V to 270V 150m A. Removed from equipment $15. FET voltmeter 0.25/1.0/2.5/25/100/250V $25. Varactor Tripler 144 to 432MHz 15W in 9W out $30. RF impedance meter 0 to 800 Ω $12. Transistor tester $20. ATV TX 70cm B modules $120. RF amp solid state 10W in 40W out, 70cm $45. Norm VK4ZFQ. NOT QTHR. Ph (077) 79 4641.

● YAESU FT290R 2m all-mode Nicads, mobile bracket $400. Kenwood TH-45A case, chrgr, pwr adptr, dry-cell case $340. Commodore Plus/4 PC, cassette, joystick, built-in software, programs on cassette and cartridge $150. Theo VK4CTK OTHR.

● TS180S PS30-PS SP180-spkr MC50-MIC BLACK CTW antenna MJF Versa Tuner H Multi 7 LDM 815 dip meter. Omega TE7-02 nosle bridge $1275. Rob VK4CDO (07) 285 5590.

FOR SALE - STH AUST

● FT101E TRANSCEIVER. Receiver Ok, faulty trans $250. Also four 6JS6C valves $10 Ea. SP102 speaker with filters $90. VK5BVJ. Ph (087) 38 0000

● YAESU FT208R 2m H/H 10 memories, mike, charger, manual, SN: IK052893 $200. Yaesu FT400 transceiver, spare new fianls, speaker, mike, manual SN: SO 53915, $300 ono. Ph (08) 381 5676.

FOR SALE - WA

● COLLINS 618T airborne HF SSB txcvr units, components & complete set. Also part repro diagrams. Write for list. VK61K Box 515 Kalamunda WA 6076.

WANTED - NSW

● ANY PAST MEMBERS or associates of Wahroonga Radio Club 1926 to 1930 or anyone with history of club is invited to contact Ian VK2WR (02) 634 7210 who would appreciate help with his research into this club.

● COLLINS KWM-2A txcvr Collins 32S-1 or 32S-3 transmitter valves 6GM6 and 6EA8 back issues of QST, Ham Radio and CQ. Contact VK2OE PO Box 1914 Wollongong NSW 2500.

● COPY OF CIRCUIT diagram & manual if available of Murphy B40 Navy Receiver and any spare tubes. Will pay all costs. Jim VK2AJT QTHR (044) 21 2786.

● FT7 txcvr in good order. Bryan Seymour, Box 55 Tumbarumba 2653. (069) 48 2904 AH.

● ONE OF THE FOLLOWING: Kenwood TS130S or TS430, Yaesu FT707, FT77 or FT757 in GC. Geolf VK2AZT any time on (069) 42 1392.

WANTED - VIC

● 120W OR GREATER AM modulation transformer. Will collect. Also MC50 mike in GC. VK3BCV Jim (054) 60 4048.

● COLLINS KWM2A T/cvr in EC. Will pay good price for right unit. Rob VK3JE (060) 37 1262 or Melb (03) 584 5737.

● AMATEURS TO HELP at the Scout Jamboree Ballarat 2-14 Jan 1992. Contact Kent VK3TER QTHR (03) 384 1610.

● BRING YOUR UNWANTED HAM GEAR to the Ballarat Hamvention Sunday 27 October 1991. Plenty of eager buyers will be waiting to purchase it. Details or to book your spot, phone Kevin Hughes VK3WN (053) 35 5011.

● ICOM IC402 or Yaesu FT790 in good order. roger VK3XRS (051) 56 8291.

● KENWOOD SP230 extension speaker, MC50 base mic. Paul (059) 83 1771.

WANTED - QLD

● MEDIUM TO HEAVY duty rotator in GC. Also desk mike for Yaesu, working or not. Ted VK4EAW (071) 28 3489.

● FOR MUSEUM PROJECT: 0-1 RF ammeter as used with WW2 AWA WS No 11. VK4YT NOT QTHR (070) 53 1952 working hours.

● BASE SK800 type lor 4CX1000A in good or otherwise cond. Also push/pull valve output transformers with screen taps. John VK4TL (070) 54 3677.

● 4CX3500 4CX5000 4CX10.000 tubes and sockets, also PA cavity for FM and 220MHz. Paul VK4SY (07) 352 6645.

WANTED - SA

● HELP help who has ability lo repair Telereader CWR900E computer communication system from Emironics. Only responsible person. J Berka Box 666 Coober Pedy 5723.

WANTED - WA

● YAESU FTV107R. Lee VK6HC QTHR (09) 293 2658.

China Welcomes Aussie Amateur Radio Operators for Relief Work

On Saturday, 17 August, history was made as a team of three Australian amateur radio operators flew to China from Sydney to set up a communications base in an area devastated by the worst natural disaster this century.

Never before has China opened its borders to international aid. It is still illegal in China for individuals to own any kind of transmitting equipment, so the only radio communications are via clubs and schools.

The flood zone is, at present, totally without communications: there are no phones, no electricity. The amateur team set up two Yaesu communications stations in the disaster area, as well as two permanent stations en route: a local VHF radio station in Shanghai which will be operated by the oldest amateur there, and an international HF station in Nanjing's Middle 22 school.

In Nanjing the team gave demonstrations and training in disaster communications work to the students.

One of the team members was Ken Fuhrmeister, a licensed operator and an employee of Dick Smith Electronics. Ken runs the amateur shack which operates out of the Bourke Street (Melbourne) store as part of the company's ongoing commitment to the amateur radio market, and will be putting some of the company's equipment to valuable use in China.

Ken has had experience working with Australian disaster relief teams, but this was his first international experience. "We are a little apprehensive," he said, "as there are no communications in the disaster area, and no one really knows what's going on. But the Chinese Government is being very supportive of our expedition, and we are hopeful that we can achieve some meaningful results."

The team left from Sydney International Airport on the CAAC flight at 1150 on Saturday, 17 August, to be met on their arrival by the Governor of Gangsu Province, the flood-devastated area. **ar**

Hamads

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address
Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even If the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.

*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope il an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

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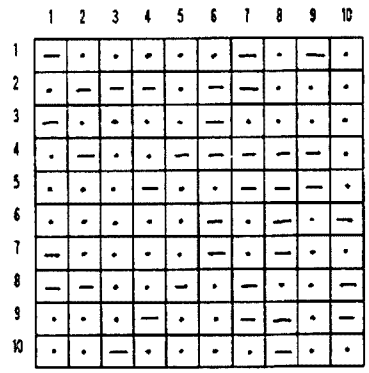
Name: ..... Call Sign: ..... Address: .....

Solution to Morseword No 55 P 39



Across: 1 earl; 2 enemy; 3 merge; 4 reds; 5 gale; 6 race; 7 steak; 8 last; 9 fix; 10 isle.

Down: 1 Innes; 2 atol; 3 bier; 4 hits; 5 Mons; 6 real; 7 wry; 8 cab; 9 leis; 10 lug.

TRADE PRACTICES ACT

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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All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

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Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

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Call Sign (if applicable): .....

Address: .....

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State and Postcode: .....

WIA Slow Morse Transmissions

VK2BWI nightly at 0930 UTC on 3550 kHz

VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm

VK3RCW Continuous on 144.950 MHz 5 wpm, 10 wpm

VK4WIT Monday at 0930 UTC on 3535 kHz

VK4WCH Wednesday at 0930 UTC on 3535 kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700 MHz

VK6WIA Nightly (except Saturday) at 1200UTC on 3.555 MHz

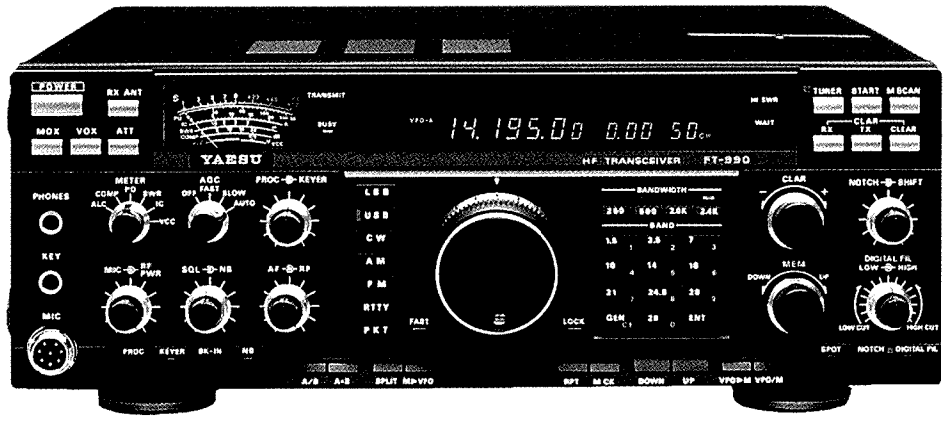
VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555 Mhz

The Tradition Continues...

YAESU FT-990 HF ALL-MODE TRANSCEIVER

Take a quick look at the all-new FT-990 and you'll soon see the similarity to the top-of-the-line FT-1000... and for good reason. The incredible FT-990 embodies many of the advanced features and ease of operation of the FT-1000. But in a more compact, economical package that sports several new advances in both transmitter and receiver design.

2 YEAR WARRANTY!



Designed For Easy Operation

Just like the FT-1000, Yaesu have designed the FT-990 to be as easy as possible to operate. The front panel layout puts all frequently used controls right where they should be..... at your fingertips. All controls are clearly labelled and the digital display provides an abundance of information in an uncluttered and easy to read format. The front panel keypad offers one-touch band selection (160m - 10m) with 2 independent VFOs per band and 90 memories that store the operating data held in both VFOs. You can't help but appreciate the large back-lit analogue meter rather than those confusing bar-graph meters found on other transceivers.

Direct Digital Synthesis (DDS)

Two 10-bit DDS and a magnetic rotary encoder provide silky-smooth VFO tuning, pure local oscillator signals, and very fast Tx/Rx change-over... and that's very important for QSK CW and digital modes. The DDS is teamed with an extremely low-noise, high performance receiver front-end using a PIN-diode controlled push-pull RF amplifier followed by a quad-FET ring mixer. The result is a very wide receiver dynamic range from 100kHz to 30MHz. Transmitter signal purity is also enhanced, with circuit noise nearly 90dB down from the carrier.

Unique Features

- Customizable RF Speech Processor - Yaesu's unique Frequency Shifted Processor (FSP) lets you shift the IF passband of your transmitted SSB signal to provide maximum punch with your voice/microphone combination.
- Digital Audio Filtering - Razor sharp audio filtering is available for tough SSB and CW reception conditions through the use of an astounding dual digital Switched Capacitance Filter (SCF) with independently adjustable selectivity skirts.
- Packet/RTTY - Separate interface jacks for a RTTY terminal unit and a Packet TNC are provided, while the mode selection buttons disable the mic automatically in the digital modes.

Convenience Features

- A highly efficient AC switch-mode power supply is built-in! It allows high duty-cycle transmission while keeping the weight way down, saving space and the added expense of external power supplies.
- An in-built Automatic Antenna Tuner with 39 memories is standard!
- Modular construction maximizes selectivity and makes servicing easy.
- Effective interference rejection is facilitated by IF shift, IF notch, IF bandwidth and SCF audio controls.
- An adjustable noise blanker, a 500Hz B/W IF crystal filter and a comprehensive, easy to read user manual are also supplied.

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Cat D-3260 **$3295**

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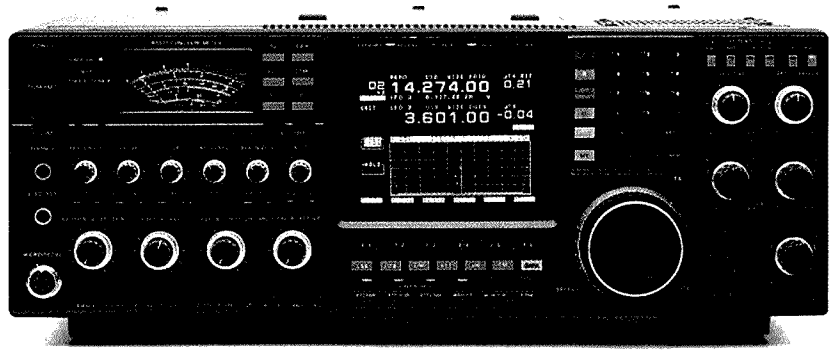

IC-781

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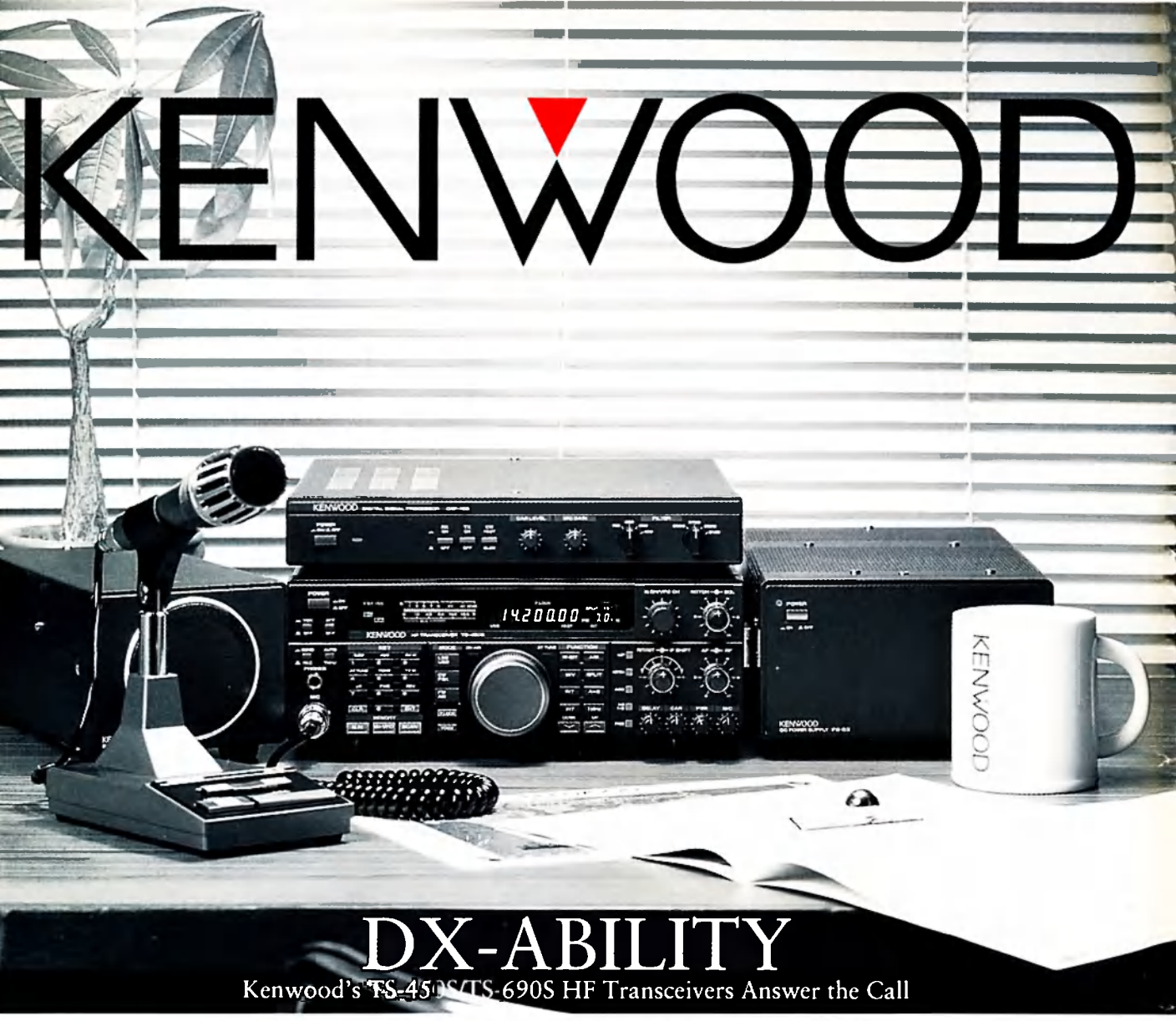
AMATEUR RADIO
NOVEMBER 1991
RRP $3.25
THE WIA RADIO AMATEUR'S JOURNAL

KENWOOD



DX-ABILITY

Kenwood's TS-450S/TS-690S HF Transceivers Answer the Call

Wherever you are, whatever the situation, you can always count on Kenwood's TS-450S and TS-690S for tough, dependable performance. Products of world-famous Kenwood engineering, these versatile HF transceivers are designed for SSB, CW, AM, FM and FSK modes of operation on all Amateur bands, including the WARC bands. To further enhance capabilities, choose the optional DSP-100 Digital Signal Processor. The AT-450 Automatic Antenna Tuner is built into the TS-450S, and is available as an internal option for the TS-690S. Along with multi-function operation and the highest levels of quality and performance, both models offer yet another advantage: ultra-compact dimensions ideal for DXpeditions and mobile use.

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

Vol 59 No 11 ISSN 0002-6859 November 1991

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The Editor
Amateur Radio
PO Box 300
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REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North Vic 3161
Telephone: (03) 528 5962
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Cover

Our theme this month is "Women in Amateur Radio" to coincide with the ALARA Contest. Pictured L to R are Denise VK5YL seated at the rig with Meg VK5AOV (Secretary and VK5/8 State Rep) and Christine VK5CTY (Senior Vice-President and Minutes Secretary). For further information about the event depicted, see the box in ALARA notes on page 38. See also "Women in Radio" on page 24 and "If You Can't Beat 'em, Join 'em" on page 26.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Free Speech?

Some months ago, one of our regular columnists proposed an alteration to the amateur regulations, and sought comment from readers as to what they thought of it. A Division of the WIA then wrote to Executive enquiring what freedom did we give our columnists to express views not in accordance with current WIA policy? This editorial is an attempt to answer that question, and also the larger one of how far, in these pages, may people go in expressing their personal opinions.

A reasonable answer to the question might be that anything is permissible providing it does not offend anyone. Unfortunately, if I have learned anything from my seven-year occupancy of the editorial chair, it is that almost anything will offend someone! To give an example. Just before I found myself to be the chosen one for editor, the front-cover picture selected for *AR* showed a church spire with a folded dipole antenna attached to it. It was a transmitting antenna for a community FM station run by a group, of which the church was one member. It fell to me, a few weeks later, to reply to a reader who considered the picture was sacrilegious, and that we should not have used it. It seemed to me that if the members of that church were not offended by the antenna, who were we to object to it?

Since then, from time to time, the odd claim or comment finds its way into our pages, usually after a considered judgment by several people that it's "fair enough", and then "bingo", someone takes violent umbrage at it; sometimes for reasons which simply never occurred to us! But, for every time this happens, I would guess half a dozen potential problems are circumvented by editorial alteration. So far I would hope we've managed to avoid several international incidents and numerous libel suits! But it is not our editorial policy to suppress any opinions, even those strongly at variance with WIA policies, or our own thoughts on the subject. The past year or two of letters in "Over to You" should prove that point!

So, talking now specifically to columnists and letter-writers, don't be surprised if your material appears in print with slight changes here and there. Sometimes they might only be matters of spelling or grammar, but sometimes they are to avoid giving offence somewhere. Nevertheless, we disclaim all responsibility for opinions you may express, in the event that someone does get really upset. It's your opinion, not ours! Even this editorial is my personal responsibility, not that of the WIA.

To conclude, contributors, don't be too discouraged. If no one ever expressed a dissenting opinion, life would be rather dull! We want to hear your opinions. And, if your statements can be shown to be undeniably true, you have nothing to fear. As the proverb says, "You can't make an omelette without cracking eggshells". Just let's be sure the omelette's fit to eat!

Errata

On page 48 of the October issue, the Mobile 6m record holder should be VK4ZAZ, not VK2. The date should also be 06/04/91. Apologies to all concerned.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

1992 Call Book

The 1992 Australian Radio Amateur Call book is now available from Divisional book shops. This latest edition of the Call Book has overcome some of the problems of the previous one, and should be a valuable addition to your shack.

As well as the traditional callsign information, it contains the usual reference material - band plans, records, repeaters, beacons and DXCC list.

Careful attention to all stages of the production has enabled the cost to be maintained at the same cover price as last year.

Amateur Radio Address Labels

Observant members will note a further change to the information on their Amateur Radio magazine address labels as from the October 1991 issue. Negotiations with Australia Post on bulk post rates disclosed that the addition of their distribution centre code on the address label would result in significant savings to the WIA.

As the label already held as much information as could be fitted in, it was found necessary to replace the membership computer number with the Postal Centre number - a sort of postcode for APO Mail Centres.

You will find this number in the top right hand corner of the label. For explanation of the rest of the label, see the WIANEWS items in Amateur Radio of March 1990 and August 1991.

Amateur Radio Promotional Video

Allan Doble VK3AMD has recently notified us of the completion of a promotional text-only videotape for use at Hamfests, displays etc.

The tape runs for almost 3 minutes, scrolling through a list of services available to WIA members in easy-to-read script over a background of the WIA winged emblem. It ends with details of the Divisional address and weekly broadcast, and could easily be adapted to suit other Divisions.

Further information can be obtained from the Federal Videotape Co-ordinator John Ingham VK5KG or from Allan direct.

DoTC Guidelines For Pager Services

Recently the WIA was asked to comment, at fairly short notice, on a DoTC Spectrum Planning Document containing guidelines on the assignment of frequencies to the pager services.

A report was prepared by Rob Milliken VK1KRM and

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers			Weekly News Broadcasts	1991 Fees	
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN	3.570MHz 2m ch 6950 Rebroadcast Mondays 8pm 70cm ch 8525 2000 hrs Sun	(F) (G) (S) (X)	$67.50 $54.00 $40.50
VK2	NSW Division 109 Wigram St Parramatta NSW (PO B ox 1066) Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100-1400 Wed 1900-2100)	VK2ZIG VK2YEL VK2AOE	From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only): 1.845 AM; 3.595 AM morning and SSB evening; 7.146 AM*; 10.125 SSB; On relay 14.160 SSB* and 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; On relay 584.750 ATV sound; 1281.750 FM. Plus automatic relays to 2m repeaters surrounding Sydney and manuals to several country repeaters. News headlines by phone (02) 552 5188	(F) (G) (S) (X)	$65.00 $52.00 $38.00
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0830-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ	1.840MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) (G) (S) (X)	$69.00 $55.00 $42.00
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK44ER VK4NEF	1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296. 100 0900 hrs Sunday Repeated on 3.605 & 147.150MHz, 1930 Monday	(F) (G) (S) (X)	$67.50 $54.00 $40.50
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM	1820kHz 3.550MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555M 146.500, 0900 hrs Sunday	(F) (G) (S) (X)	$67.50 $54.00 $40.50
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland-Thomas	VK6LZ VK6AFA VK6OO	146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R) 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs	(F) (G) (S)	$59.00 $57.50
VK7	Tasmanian Division 148 Derwent Ave Lindislarne Tas 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK	146.700MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$65.00 $52.00 $38.00

VK8 (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28MHz).

Note: All times are local. All frequencies MHz.

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times

Paul Bell VK1BX, two amateurs technically qualified and active in the field who have assisted the WIA in the past with similar issues.

Their report states that the working standard produced by DoTC is excellent and, if not relaxed later, should be unreservedly accepted by the WIA. However, it suggested that one new paragraph should be incorporated as follows:

Where the side band noise remains a problem to the receiver of another service, the paging service be required to install a notch filter on the receivers frequency with all costs to be borne by the receiver. That notch filter to have an insertion loss not greater than 0.3dB.

This filter on the pager would assist compatibility with the amateur service. As the pager is already meeting specification, it is expected that the amateur repeater owner should bear the cost of the filter. Incidentally, placing a filter at the amateur receiver is not possible, as the frequency involved is the amateur receive frequency.

This recommendation has been conveyed to DoTC.

Another feature of the new guidelines is that they allow for a doubling of pager EIRP but, as this is only a 3dB increase of the carrier, it was not considered a major concern.

In their report to the WIA, Rob and Paul suggested the following guidelines for amateur radio band planners for the 144-148MHz band:-

a. If possible all new top end (147 - 148MHz) allocations be made so that the repeater transmit frequency is higher than its receive frequency in order to distance the repeater receive frequency from pagers just above the top edge of the band.
b. Where problems arise with existing services, reverse the repeater input and output frequencies, or use the notch filter, whichever is better and most cost effective.
c. Where reversal of repeater input and output frequencies is cost effective but clashes with other services, including co-channel amateur repeaters, invert both in order to avoid the possibility of repeater "sing around".

These suggestions will assist the WIA Federal Technical Advisory Committee (FTAC) in defining WIA guidelines for overcoming pager interference to 2m repeaters.

Rob and Paul have also stated that, in their opinion, the amateur service will have to increase its technical standards for equipment co-sited with pagers. For example, the notch filter identified earlier will need to be a commercially built item as it will be associated with commercial pager transmitters.

These sentiments may be unpopular with some amateurs but, as pagers are a very real problem, they may be the only way we can continue to co-exist.

"Code-free Novice" Licence

Throughout its history the WIA has been actively concerned with reviewing the licence conditions and privileges of the Amateur Service. Submissions from the WIA have gained Australian radio amateurs the Limited licence, the Novice licence and, more recently, VHF privileges for Novices.

These submissions were developed as a result of extensive discussion at Divisional and Executive level to establish an overall WIA policy, generally as a result of voting at a Federal Convention.

At the 1988 WIA Federal Convention, when the report of the "Future of Amateur Radio Working Party" was adopted, it was unanimously agreed that the WIA policy should include a rationalisation of licence entry level and band/power privileges. In effect, it proposed that the technical proficiency, as demonstrated through the Theory examination, should determine the mode and output power permitted, while the Morse code proficiency should set the frequency bands.

This is most easily explained using the matrix approach which has been published previously. It is reproduced here in Figure 1 for the benefit of members not familiar with it.

The logical next step in the policy is the formulation of another grade of licence, as shown in the matrix in Figure 2.

It is worth noting that a number of other national amateur radio societies, including the USA, Great Britain and Japan, have obtained VHF Novice style licences for their amateurs.

Discussions with David Hunt, Manager Licensing at DoTC in Canberra, at the time of adoption of this WIA policy in 1988, and again in 1989 after VHF privileges for Novices were granted, disclosed that DoTC would be prepared to consider a submission for a "code-free" Novice licence.

The proposal has now had plenty of time for consideration by members, and has recently again been circulated to Divisions.

Consequently, the WIA submitted an application to David Hunt during September 1991 for a class of licence to which entry requirements will be Novice level Theory and Regulations only. Privileges requested will be the same as for existing Novices on VHF - FM only, 146 - 148 MHz, 10 Watts.

What will the new grade of licence be called? "Limited Novice", "VHF Novice", or perhaps something quite different?

Members will be kept informed of progress.

Fig 1 EXAMINATION MODEL

THEORY		BASIC	FULL
MORSE	Nil	VHF Novice	VHF Intermediate
	Slow	Novice	Intermediate
	Fast		Unrestricted
REGULATIONS		One Test	

Fig 2 LICENCE MODEL

GRADE	TECHNICAL	BANDS
VHF Novice	CW/SSB/AM/FM Low Power	Novice VHF/UHF
Novice	CW/SSB/AM/FM LowPower	Novice HF/VHF/UHF
VHF Intermediate	All Modes High Power	All VHF/UHF
Intermediate	All Modes High Power	Novice HF All VHF/UHF
Unrestricted	All Modes High Power	All VHF/UHF All HF

Deregulation of the Amateur Service

At the 1991 Federal Convention the WIA was invited by David Hunt from DoTC to consider further possible steps towards deregulation of the Amateur Service, with particular reference to repeaters and packet stations.

A small committee has been hard at work on this important and complex subject since then and was due to report back at the October quarterly meeting of Executive and the Federal Council.

Much of the input received has come from Kevin Olds VK1OK, and the Chairman of FTAC, John Martin VK3ZJC who, with valuable assistance from the West Australian Repeater Group Inc, John Robinson VK2XY, and others, has provided a detailed reworking of many sections of the regulations relating to repeater, packet and RTTY transmissions.

1991 Ron Wilkinson Award

The WIA has several ways of recognising service by its members or other radio amateurs. One of these is the Ron Wilkinson Award, which was instituted in 1977 through the generosity of Mrs Mary Wilkinson in memory of her husband, the late Ron Wilkinson, VK3AKC.

This Award is made annually in March, nominally on the 3rd of the month, to acknowledge special achievement in any facet of amateur radio. Technical or administrative expertise, community service or any similar field may be considered.

The Award comprises a certificate and a cash prize, including a year's membership of the WIA. We mention this Award at this time because nominations for it for 1991 must reach the Executive Office by 30th November 1991. Although preference is given to WIA members, non-members are eligible also.

So, if you know of someone who has made a significant contribution to amateur radio in the last year, or over an extended period, please feel free to pass on the name or names to your Divisional Federal Councillor in good time for it to be considered by the Division and forwarded to Executive by 30 November.

Three Year WIA Membership

At the end of November well over half of the WIA members will receive notices advising that their annual membership renewal is due on 1st January 1992. How many members have considered the money saving advantages of renewing for a three-year membership?

A three year membership of the WIA allows you to pay for the next three years for just the cost of three times this year's subscription, thus avoiding the seemingly inevitable cost increases in subscriptions that will be made in the two following years.

Incidentally, for those hundreds of WIA members who have already availed themselves of this facility, do not become concerned if you do not receive a membership renewal notice at the end of November. Simply check the top line of the address label from a recent copy of Amateur Radio magazine to see if your renewal is really due this year before you send us any money. We hate having to return your money, but must do so if there is still another year or two of your membership to run.

Whoops!!

In the WIANEWS column in the October 1991 issue of Amateur Radio magazine, under the heading "Buyer Beware", a comment appeared on the likelihood of overseas "bargains" not being appropriate to the Australian scene and referred to the possible need for expensive modifications. Unfortunately, the published item also suggested that such modifications may be illegal.

Obviously that is not correct. As it stands in Australia, any illegality can only concern the use of the equipment, not the modifications. Very few amateurs have not made some modifications to their gear.

The paragraph in question was condensed from a news item received in the office, which also referred to the modification of amateur equipment for use on non-amateur frequencies, and the use of the modified equipment on those non-amateur frequencies. Unfortunately, in the editing for publication, the words *"and possible illegal"* were inadvertently left in, so putting a completely incorrect connotation on the remaining statement. Our apologies if the error has caused any confusion.

EMC Symposium

The IARU Region 3 News bulletin announces that the 11th International Symposium on Electro Magnetic Compatibility is to be held from 2nd to 4th September 1992, in Wroclaw, Poland, and has called for original, unpublished papers. After the Seminar, a meeting of the International Special Committee on Radio Interference (CISPR) will be held at the same location.

Amateur Exams

The delegation of administration of radio amateur qualification examinations by the DoTC to the WIA has caused a ripple throughout the amateur service in Australia. Quite a lot of comment has appeared, in various forms, in the public arena over the past three months. However, although much of that comment was questioning and constructively critical, some of it was uninformed, emotive, and complete nonsense.

Ever since the "bombshell" discussions with the DoTC in June this year, and up until the start of the new WIA Exam Service system on 1st October 1991, I (VK3ARZ) worked seven days a week to try to put together the best possible examination system for the amateur service in Australia. One that best met the needs of examiners, candidates and the DoTC. I did not have the time to respond to the "nonsense" publicly. However, during that time many concerned amateurs and examiners contacted me and asked questions. Naturally, they were not all completely happy with all the answers, but without fail they all provided input that was invaluable in putting together the final system. Those people at least tried to find out what was happening before making judgements.

Looking back now at some of the comment and misinformation that appeared over the past three months, it is interesting to note that the apparent authors of the most critical, passionate and misinformed material made no effort to contact the WIA Exam Service to find out what was happening before they publicly expressed their views. Subsequently, however, a couple of the authors of the public "nonsense" telephoned me and, after finding out the facts, apologised for "sounding off" in public before they knew what they were talking about!

Now that the new system is up and running, let me provide a few blunt comments and answers.

Why was the system changed? Particularly when many clubs and individuals who were conducting examinations under the "devolved" system were doing a great job, and could have continued to do a great job under that system.

Put simply, the answer is that the resources of the DoTC were unable to keep up with the administrative workload, and the increasing number of very poorly presented examination papers submitted for approval. That was the first major problem.

The second major problem was the "rorts". As is so often the case, a handful of people

"stuffed it up" for the majority. Cheating, wide-spread publication of the far too small question banks. etc.. Sadly, having the technical ability to prepare an acceptable examination paper did not necessarily mean that some people had the integrity or intent to conduct examinations properly.

I have read and heard the comment that the WIA forced the DoTC to hand over the examinations. What rubbish! It has been WIA policy for years that the DoTC should run amateur examinations. The WIA as the sole examining body was a distant third in the options published in the 1987 WIA Examinations Devolvement Package. (Option 2 was that DoTC set the examinations, and that others invigilate the exams.)

Quite frankly, the WIA needs examinations like it needs a hole in the head. But what else could the WIA do? DoTC wanted to bail out. Who else could do it? The WIA is the only amateur radio body in this country with the resources, and the belief in the future of amateur radio, to do it!

Another area where a lot of ill-informed comment and criticism has been aired is in regard to the cost of examinations from WIA Exam Service. Some have accused the WIA of "ripping off" the amateur service; still others have stated their earnest belief that the WIA will devalue the exams by setting fees that are too low! Here are some facts.

As WIA Exam Service examinations will be provided to examiners and candidates without favour, whether they are members of the WIA or not, it is important that the cost of providing the examination service is not subsidised by WIA membership fees. Equally, it is important that examination fees should not be subsidising the WIA. Hence, WIA Exam Service has been carefully set up on a non-profit commercial basis.

Strictly speaking, from a cost accounting point of view, even though the total cost of $30.00 for a suite of four exam subjects is valid, the split-up of fees of $10.00 for a theory exam, $5.00 for regulations, $10.00 for Morse receiving, and $5.00 for Morse sending, does not hold water. However, to minimise as much as possible the confusion associated with this change in examinations, it was decided to stay with those long time "standard" basic fees for the time being.

Setting up for the new examination system has cost the WIA just over $14,000. It will take three years to recoup that amount.

Another concern expressed by some examiners under the DoTC system is that they are not being automatically accepted as examiners under the new system. The fact that WIA Exam Service requires nomination from a recognised radio club, or two acceptable character references, is not a reflection on any individual. Because of the few who "rorted" the old system, it is necessary for every applicant to be an accredited examiner under the new system to have his application supported in this manner.

The work in putting together an examination system which satisfied everybody was unbelievable. Information was sought and received from examiners and amateurs, both WIA members and non-members, located all over Australia. Many of these people were not only experienced amateur examiners, but also were professional educators. The one thing they all had in common was that they held totally different views on almost every aspect of the administration and conduct of amateur examinations! It was a real challenge to come up with a system which met the needs and opinions of the majority.

Now, a word of warning! This new system of examinations is only as good as the people running it. No system is perfect or foolproof. Even though many new aspects of this new system have reduced the ability to "rort" the system, nevertheless dishonest examiners may still be able to do it. If cheating by accredited examiners is proven, be advised that not only will the examiners lose accreditation, but DoTC have advised they will withdraw all qualification credits for all candidates who have sat any exams run by the guilty parties.

If you have any further queries about the new amateur examination system, get your information from one of the new accredited examiners, or from WIA Exam Service in Melbourne.

More on Exams

Applications for accreditation as an examiner with WIA Exam Service have been coming in steadily since the Executive Office began accepting applications. In the first 10 days alone, over 70 examiners were accredited. One encouraging aspect of the applications received to date is that most of them have come through amateur radio clubs or societies, with the clubs often nominating 3 or more persons.

The new examination system sees the examiners taking a rather more high-profile role in the amateur community, as their names will be on the lists supplied by both the WIA and the DoTC to people seeking information about all aspects of amateur radio, not only examinations. The WIA also intends to publish updated lists of accredited examiners at regular intervals in Amateur Radio magazine, and will supply the lists to DoTC. So, in many cases, the WIA Exam Service accredited examiner will be the first point of contact with the hobby for the newcomer.

Of course there will always be candidates who are a long way from another amateur, let alone an accredited examiner. WIA Exam Service is able to assist these people by providing arrangements whereby non-amateurs in their locality may be able to supervise examinations for them.

Still More on Exams - What Candidates Should Know

The WIA has made considerable efforts to ensure that all likely examiners have been informed of the protocol for the WIA Exam Service, but has not directed much information towards the candidates. There is much that potential radio amateurs should know as they approach the exams.

Many candidates will not read these words of advice, as many do not join the WIA until after receiving a licence. Hence we ask all members who are in touch with non-member candidates to bring this information to their attention.

An examination candidate can expect to acquire information about amateur radio in general from any accredited examiner. If the initial contact is through the WIA, or through DoTC, a candidate will be provided with a listing of all examiners in their state. Once a formal examination application has been made, the examiners should inform the candidate of the date, time and location of the next examination. They should also advise the candidate of the need to bring pen and ruler and, for CW sending, perhaps some type of oscillator and key, although most examiners may prefer to provide these. It may be considered helpful to candidates if they have some idea of the number of other candidates. The order in which the exam segments will be run should also be notified to candidates in order to avoid long periods of waiting for the appropriate section.

Candidates should also be aware in advance of the examination procedures, the ten or five minutes reading time, the need to fill in all the information on the answer sheet, the length of each examination segment, how to sort out any problems with the papers, and the procedure when each section of the exam is finished.

The theory and regulations examinations papers are "multi-choice", ie. each question contains a statement or question after which there are four alternatives, listed a, b, c, and d. The candidate must decide which of the four alternatives best completes the statement or answers the question, and indicate that choice by encircling the letter of that alternative on the answer sheet. NOTHING SHOULD BE WRITTEN ON THE QUESTION PAPER.

Each question carries two marks and, as there is no penalty (apart from not gaining two marks) for a wrong answer, nothing is lost by guessing. A pass mark is 70 % or more. Theory papers comprise 50 questions, to be answered over 1 hour for Novice and 1 1/2 hours for AOCP, and regulations papers are 30 questions to be answered in half an hour.

Details on the ANSWER SHEET must be completed before beginning to answer the questions. Some candidates may find it helpful to study a copy of the answer sheet before attempting the examination. Care must be taken that the question number on the answer sheet matches the number of the question. This check is especially important when going back to answer a question omitted on the first run through the paper.

If there is a problem with any part of an examination paper, such as a page missing from a theory exam, or a question is incomplete or unreadable, this should be drawn to the attention of the examiner. If the validity of a question is in doubt, that should also be brought to the attention of the examiner at the time; then, after the exam is over, it should be discussed with the examiner to ensure that the candidate's complaint is noted and forwarded to WIA Exam Service with the return of the papers.

For the Morse receiving exam there is a two minute practice time, which will allow for adjustment of headphones or settling the nerves, then a few seconds pause before the exam text begins. Several candidates may take the Morse receiving exam at the same time. It is preferable to PRINT the text received in block capitals to avoid any risk of misreading. Writing must cease immediately the text ceases.

For the Morse sending exam, a short practice for any adjustments is allowed before sending the exam text. Sending will be recorded on a tape recorder, with the examiner identifying each candidate by voice beforehand. Start and finish signals must be used, and any errors corrected by sending the error signal and starting again at the START OF THE LAST WORD CORRECTLY SENT. For one error properly corrected, an extra 10 seconds overall time is allowed.

Any comment or complaint about the procedures followed or the management of the examinations should be discussed firstly with the examiners.

If not resolved in this manner, it should be brought to the attention of WIA Exam Service.

When all candidates are finished the exams the examiners will mark the papers and Morse, and provide a provisional assessment.

This assessment will be confirmed from WIA Exam Service within a few days of receipt of the returned examination materials.

Please note that it is the candidate's responsibility to hold the Pass Certificates for exam segments until a full set is obtained, at which time they can be presented at any DoTC office for issue of a Certificate of Proficiency and a Station Licence.

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SOME EXPERIMENTS WITH THE SMALL TRANSMITTING LOOP AERIAL

LLOYD BUTLER VK5BR
18 OTTAWA AVE, PANORAMA 5041

Introduction

IN SEVERAL OF MY PREVIOUS articles, I have discussed various forms of loop aerials for receiving radio signals. Such aerials are unsuitable for transmitting signals and I thought I would now turn my attention to small loops suitable for transmitting. By definition, the small transmitting loop is one which has a circumference less than one quarter of a wavelength.

Because of its small size, it is possibly an attractive proposition for someone with inadequate space to erect a larger aerial. For example, an efficient loop can be constructed for the 14MHz band about one metre square. The small loop might also be attractive for operation in the field.

The small transmitting loop has been around for a long time but it appears to have been improved for amateur radio by Ted Hart W5QJR who developed a set of equations to calculate the various loop constants and set down parameters for a new design (refer *QST*, June 1986). The latest issue of the ARRL Antenna Handbook also has some excellent material on both transmitting and receiving loop aerials.

The section on small transmitting loops was written by Ted Hart, and this includes his design formulae plus a complete set of worked-out data for practical loops. The design formulae, taken from this section, are repeated in the appendix at the end of our article.

To gain some experience with the small transmitting loop, I experimented with several forms of the loop essentially for use at 14MHz. I selected this band because the loop dimensions, suitable for 14MHz, enabled construction to be easily handled.

Because of its narrow bandwidth, the transmitting loop tuning has to be tracked as frequency is shifted across the band. Ted Hart suggests remote motor controlled tuning. In the course of my discussion, I will introduce another idea which I found satisfactory to track the tuning across the band without the use of the motor controlled tuning.

Halos can be handy, but for flat dwellers loops can be heaven sent.

From Ham Radio Today — *April 1988*

The Difference Between Transmitting & Receiving Loops

One might well ask why our receiving loops are unsuitable for transmitting. Most other aerial systems are reciprocal in operation, so why not these? To answer this, we must point out that in our receiving loop we are interested only in signal voltage. The loop is parallel tuned and coupled to the high impedance input of an amplifier enabling the Q factor of the tuned loop to multiply the signal voltage. In our receiving loop, we are not really interested in power efficiency. If we were, we would find that most of the signal power is consumed in the loss resistance of the loop. However, to transmit a signal, RF power must be transferred into the loop and developed across the radiation resistance of the loop.

The radiation resistance of a small loop is typically only a fraction of an ohm. To achieve any reasonable figure of efficiency, the loop loss resistance must also be a very low value otherwise most of the power is dissipated in the loss resistance. Wire loops as used in receiving have a loss resistance in the order of ohms, and to achieve the low loss resistance needed, transmitting loops are made with large diameter copper tube. Special attention must also be given to minimising resistance in the loop tuning and matching components, particularly the loop tuning capacitor.

The equivalent circuit of the loop aerial is shown in figure 1. The predominant component is the loop inductive reactance, which is large compared with the sum of the radiation resistance Rr and the loss resistance RL. Because of the high ratio between reactance and resistance, Q factors are extremely high, in the order of many hundreds, and often greater than 1000. The loop is set to resonance at the operating frequency by parallel capacitance Ct connected across the loop. Maximum operating frequency is limited to a frequency set by the resonance of the loop inductance L with the loop stray capacitance Cd. Because of the high Q, bandwidth of the loop is very small and it is necessary to alter the tuning capacitance when changing frequency more than a few kHz. The Ted Hart design calls for remote control of the tuning network which adds some complication to the construction of the loop aerial system.

Tuning Capacitors

Selecting the tuning capacitor requires special attention. In the QST article, Hart used the two halves of a split stator capacitor in series so there were no wiper contacts, normally in contact with the rotor, to add series resistance. He also recommended the capacitor plates be welded together to reduce resistance rather than be separated by spacers.

Because of the high Q factor, the voltage developed across the capacitor is quite high. Even using only 100 watts of power, the voltage can be as high as 10 to 15 kilovolts. Not only must the capacitor be selected for low resistance, but also its plates must be wide spaced to withstand the voltage. Calculation of the voltage developed is included in the appendix. As a guide to the spacing required, breakdown voltage in air is around 30 peak kilovolts per centimetre.

Matching

One way to match a 50-ohm line to the

low resistance of the loop is to use a balanced L network of shunt Xc and series X_L. As a total reactance equal to the inductive reactance of the loop less the series reactance required for matching. The matching circuit is shown in figure 2. In my initial tests, I used this system, but it does have its problems. First of all, two isolated tuning capacitors must be ganged together. A split stator capacitor with common rotor cannot be used. I did find I could operate the tuning quite well without ganging by matching the setting of the two series capacitors at the centre of the band and adjusting only one to tune over the band. I also found the input shunt capacitor could be fixed for the whole band.

Apart from the physical problems of ganged capacitors, the system has inherent loss in the two series capacitors as they provide loop tuning connected via their stator wipers. One way to reduce the effect of this loss resistance is to add capacitance across the loop, in effect increasing the value of Cd. By doing this, the parallel circuit loop constants (figure 3a) can be considered as equivalent to a simple series circuit of inductance and resistance (figure 3b). The equivalent resistance component is much higher than the series resistance of the loop ($R_r + R_L$). The higher the value of Cd, the higher is this component and hence the less effect of loss resistance in the tuning capacitors. Of course, too much capacitance Cd will prevent the loop from being brought to resonance. The fixed capacitor added must also be low loss and withstand the high voltage. I made use of a short length of heavy duty coaxial cable which provides a capacitance of around one picofarad per centimetre. This worked quite well for some time until one day the high voltage developed by the loop blew a hole through the polythene dielectric. A better idea would have been to use fixed plates spaced in air sufficient to withstand the voltage.

All in all, the balanced L network has its limitations as a matching system for the transmitting loop and, in fact, Ted Hart described it as an inefficient system. In his system (figure 4) matching is carried out via a gamma match at the bottom of the loop and separated from the tuning capacitor which is connected across the open ends of the loop at its top. The tuning capacitor is coupled to a stepper motor with gear drive to give adequate tuning resolution. The motor is remotely controlled via a cable which runs through the inside of the loop tubing.

The system I finally installed separated the matching system from the loop tuning, as Ted Hart had done, but made

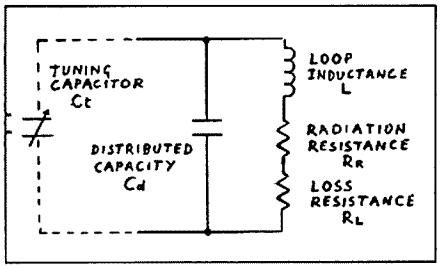

Figure 1. Equivalent circuit of the loop aerial

use of a delta match in place of the gamma match. The reason for this will be explained further on.

The Loop

Ted Hart has pointed out that, for a given length of conductor, a circular loop (or something approaching a circle such as a hexagon) gives more loop area than any other shape and hence it is the best choice of shape. I accept this, but my receiving loops have all been square because it was easy to make up square or diamond shaped loops using a simple frame of two crossed pieces of wood. My first transmitting loops were made up the same way using the outer conductor of heavy duty coaxial cable and, to make a direct comparison, the copper tube loop was followed up with a square of the same size.

My final loop was made up 0.97 metre

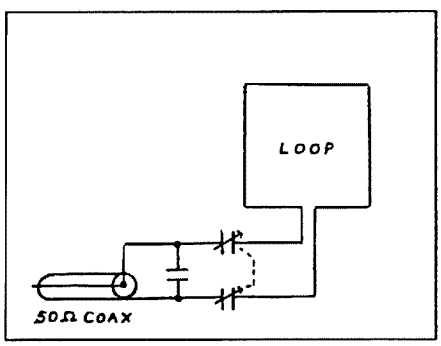

Figure 2. Matching the loop aerial with the balanced L network

square with 3/4 inch copper tube obtained from the local plumber. The tube was cut and assembled to the form shown in figure 5 using copper elbows for the right-angle joints. All joints were silver soldered, thanks to John VK5JL. Details of the loop and calculated constants for 14.2MHz are as follows (Imperial measurements are used because the published formulae, as repeated in the appendix, are given in these units):

Tube Diameter d = 0.75 inch
Circumference S = 12.7 feet
Area A = 10 square feet
Frequency f = 14.2MHz
Power P = 100 watts
Radiation Resistance Rr = 0.137 ohm
Loss Resistance R_L = 0.064 ohm
Efficiency n = 68%
Inductance L = 3.27 micro-henry
Q factor = 723
Inductive reactance X_L = 291 ohms
Bandwidth B = 19.6kHz
Distributed capacity Cd = 10.4pF
Capacitor potential Vc = 4587V
Tuning capacitor Ct = 28pF

Whilst the loop design was aimed at the 14MHz band, the loop can be tuned to other bands, and calculated constants for some of these are as follows:

Frequency	Rr	RL	Efficiency	Tuning C
7MHz	0.008	0.045	15%	148pF
10MHz	0.034	0.053	39%	67pf
21MHz	0.66	0.077	89%	8pf

(Rr and RL are in ohms)

It can be seen that operation at as low a frequency as 7MHz is possible, but with low efficiency. The efficiency is improved as the frequency is increased, and at 21MHz efficiency is very high. Operation at 28MHz is not possible because self-resonance occurs at a frequency just below 28MHz. The calculations do not take into account losses in the tuning capacitor which could further decrease the efficiency.

The advantage of the large diameter copper tube is demonstrated by comparing with the same sized loop utilising the outer copper braid of the coaxial cable. (The braid is 5/16 inch diameter). The calculated loss resistance of the coax loop at 14.2MHz is 0.14 ohm and the calculated efficiency is 41 per cent. This compares with 68 per cent for the 3/4 inch copper tube loop.

Tuning the Band Without the Drive Motor

I found a way to remotely tune over the band without the drive motor. The gamma match is replaced by a delta match which is fed with 300 ohm balanced TV open wire line. This type of line has extremely low loss at HF even if used in a tuned mode. The loop tuning capacitor is set for resonance in the centre of the band (say 14.2MHz) and at this frequency the delta taps are adjusted for a 300 ohm match. The open wire line is fed from the transmitter via some form of balanced tuning system (refer figure 6). The Z match tuner does the job very nicely.

To set up the system, the tuner is first loaded into a 300 ohm resistor and adjusted for matching at the centre frequency. This can be done by connecting a noise bridge at the transceiver output and operating in the receive mode. The open wire line is then connected in place

of the resistor and the loop tuning is adjusted for best balance of the noise bridge. Some adjustment of the delta match taps might also be required, but the tuner adjustment must not be altered from the setting determined using the 300 ohm resistor. Remove the noise bridge and verify that there is low SWR on transmit. If necessary, the loop tuning can be trimmed for best SWR. This whole operation is a little tricky because the loop tuning must be carried out within hearing distance of the noise bridge in the receiver. If the loop tuning is carried out using the SWR meter, the SWR meter must be within vision. I found it necessary to tune the loop with it first located close to the transceiver and connected via a short length of the open wire line. If matched properly, the loop tuning can be assumed to be correct for whatever length of line is ultimately used.

Another problem is that the loop is very susceptible to detuning if in close proximity to any conductors, including the human body. This makes setting the tuning capacitor by hand a little tricky.

Now, having set the loop tuning and matching, this is how the system works. If we shift very far from the centre frequency, the high Q loop goes out of tune. The procedure is then to readjust the tuner for low SWR, in effect reflecting down the open wire line into the loop a reactance sufficient to correct for the detuning. Off the centre frequency, the open wire line works partly in a tuned mode. The nature of the impedance change placed across the line by the tuner is obviously a function of line length, but for the various random lengths of line I use myself, the Z match tuner was easily able to handle the correction over each amateur band tested.

For the copper tube loop described, I found a good match to the 300 ohm line was obtained if the delta match taps were set as follows:

14 and 21MHz — each tap 17.5cm from centre

10MHz — each tap right to the end of the tube elbows, 44cm from centre

7MHz — fit the taps on the side tubes, 8.5cm from the top

You may have noticed by now that my delta match is at the top of the loop and tuning across the open ends is at the bottom.

This is the opposite of the Ted Hart loop. One reason for this is that with the heavy variable capacitor at the bottom, the centre of gravity is lower and it hangs better on my rope support. A second reason is that tests were carried with the loop just above body level, and by running the feeders to the top of the loop, they were kept clear above head height.

I experimented with a further idea of leaving the taps set at the 14/21MHz position and correcting for the mismatch at 7 and 10MHz with the tuner. This would allow the loop to work at high efficiency in the higher DX bands whilst also permitting lower efficiency operation for more local contacts on the 7MHz band. (Quite apart from any loss due to mismatch, it was pointed out earlier that, in any case, the efficiency on 7MHz is inherently low due to the low ratio of Rr to RL). Unfortunately, fixing the matching tap settings for all bands does not solve all the problems for multiband operation. The loop tuning capacitor still has to be set to a different fixed value for each band. So my idea of a partly tuned line to eliminate remote motor control of the tuning capacitor is essentially a one-band system, unless the capacitance is pre-switched, or remotely switched when changing bands.

I should make some comment about the 300 ohm open wire TV line discussed. Unfortunately, it is difficult to obtain these days unless a disposal source can be found. Over past years it was in common use to feed TV antennas in fringe TV areas. If this type of line is unavailable, open wire line can be made up using parallel wires kept apart by pieces of perspex, polystyrene or similar insulating material. Although more lossy for the tuned feeder mode of operation, a last resort could be 300 ohm TV ribbon.

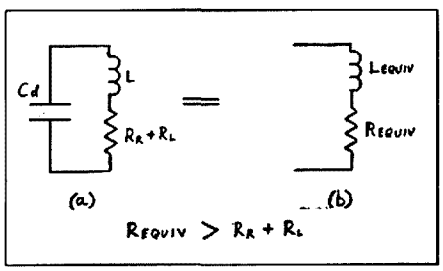

Figure 3. Added shunt capacitance makes the loop resistance (Rr+RL) appear as a higher equivalent value

Operational Performance

One confusing thing in the literature published on the transmitting loop is the loop directivity. The material submitted by Ted Hart shows a bi-directional radiation pattern with maximum signal in line with the plane of the loop and minimum signals or null at right angles to the plane. This is the same as normally expected around a small receiving loop. I was initially a little confused when my one-metre-square loop operating on 14MHz clearly provided a bi-directional pattern with its maximum signal at right angles to the plane of the loop. An answer to this anomaly seems to be in the following: The receiving loop pattern is based on the fact that the current is uniform around the perimeter of the loop. When the perimeter is around 0.1 wavelength or greater, this ceases to be true, and the pattern changes, taking up a pattern more like the large loops such as the quad.

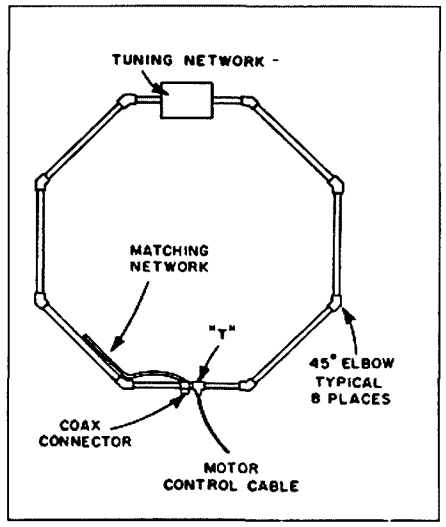

Figure 4. The small transmitting loop — design by Ted Hart W5QJF

The perimeter of my loop is around 0.2 wavelength at 14MHz and around 0.1 wavelength at 7MHz. The loop pattern appeared similar for both 14 and 7MHz. A rough test was carried out on the loop in a receive mode using an oscillator source. This was moved around the loop in a circle of 6m radius at loop height above the ground. Definite nulls were recorded in line with the plane of the loop. At six metres we are in the induction field of the loop and I don't know whether this makes the measurement an anomaly. Nevertheless, several reports from other stations worked on 14MHz supported maximum signal when the loop was rotated at right angles to the plane of the loop.

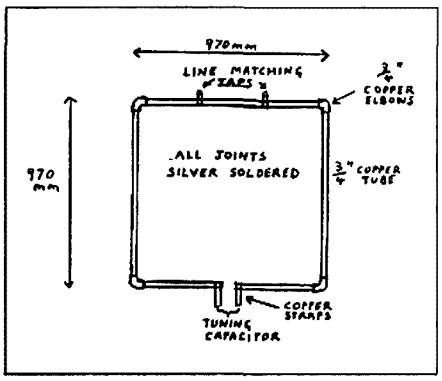

Figure 5. Detail of the loop assembled by VK5BR

Whilst the field pattern horizontally in line with the loop might have pronounced nulls, at higher radiation angles the pattern becomes more omni-directional. I found I could work distant stations in all directions without rotating the loop. For sky wave operation there might be only a slight advantage in having a facility to rotate the loop. Another factor not addressed is the effect of the ground reflected signal. We know that with a dipole we can control the angle of maximum radiation by the height of the dipole above the ground. I obtained quite encouraging results with the loop fairly close to the ground. Perhaps these results could have been improved had the loop been mounted higher.

Operational tests with other stations were first carried out on 14MHz. The loop was set up in my willow tree with the bottom of the loop about one metre above the ground. Switching was arranged so the transceiver could be changed, during transmission, between the loop and either of two full-sized wire aerials oriented in different directions. Signal reports were received from interstate and overseas stations and I was repeatedly told there was little to choose between the signal strength from the loop and that from the particular wire aerial used. This seemed very encouraging considering the small size of the loop. At one stage, I had the loop set up for adjustment inside my garage, which is a steel structure except for one small wooden door and two small windows. I was surprised to find that, even in this shielded environment, I was able to carry out a QSO with stations in NSW and Tasmania. I was also sending quite a strong signal into Victor Harbour over the other side of the ranges.

Some further QSOs were carried out with interstate stations when the loop was tuned up on 7MHz. This, of course, was back under the willow tree. As might be expected because of the lower efficiency on this band, signal strength reports for the loop were two or three S points below that given for my half-wave inverted V.

Summary

An introduction has been given to the small transmitting loop aerial. Considering its small size, its performance is quite surprising. If one has space for a full sized aerial then there is not much point in building this type of loop. However, if you have limited space, or you need a compact aerial system to operate in the field, then the small transmitting loop might be a proposition. Its biggest problem is its narrow bandwidth and the need to carefully peak up its tuning whenever shifting frequency across the band. This can be done using a remote controlled motor with reduction gearing system driving the tuning capacitor. I have suggested another method using a partly tuned open wire TV transmission line.

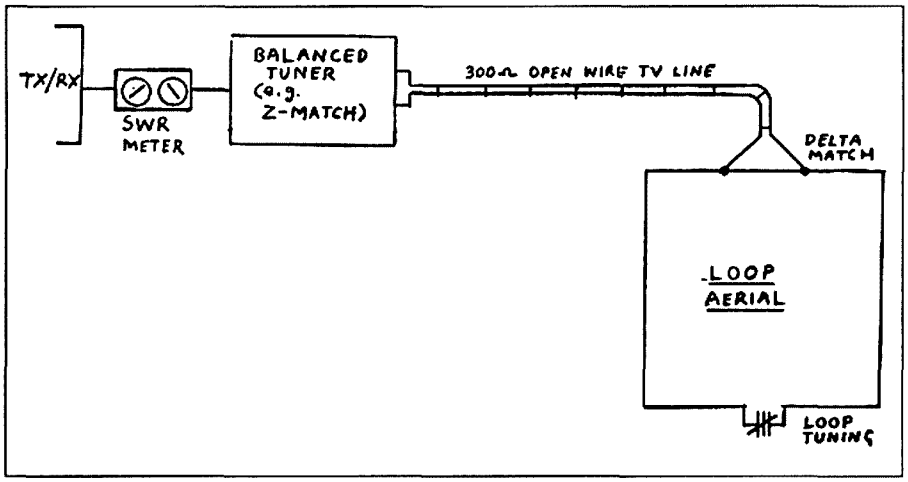

Figure 6. Matching system using open wire TV line. The loop is resonated with the line matched at band centre frequency. To tune the loop across the band, reactance is reflected down the line.

Copper tube and copper elbows for construction of the loop can be obtained from local plumbing suppliers. A suitable tuning capacitor, with low resistance loss and plate spacing to withstand the high voltage, might be more difficult to procure.

If you are interested in the small transmitting loop, I suggest you read at least one of the two references given below.

References

1. Hart, Ted W5QJR — Small, High-efficiency Loop Antennas — *QST* June 1986.

2. Loop Antennas — Chapter 5 — *The ARRL Antenna Handbook,* 1988 issue.

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APPENDIX

LOOP DESIGN FORMULAE FROM THE ARRL ANTENNA HANDBOOK

Basic Equations for a Small Loop

Radiation resistance, ohms	$R_R = 3.38 \times 10^{-8} (f^2A)^2$
Loss resistance, ohms	$R_L = 9.96 \times 10^{-4} \sqrt{f} \frac{S}{d}$
Efficiency	$\eta = \frac{R_R}{R_R + R_L}$
Inductance, henrys	$L = 1.9 \times 10^{-8} S \left(7.353 \log_{10} \frac{96 S}{\pi d} - 6.386\right)$
Inductive reactance, ohms	$X_L = 2 \pi f L \times 10^6$
Tuning capacitor, farads	$C_T = \frac{1}{2 \pi f X_L \times 10^6}$
Quality factor	$Q = \frac{f \times 10^6}{\Delta f} = \frac{X_L}{2(R_R + R_L)}$
Bandwidth, hertz	$\Delta f = \frac{f \times 10^6}{Q} = (f_1 - f_2) \times 10^6$
Distributed capacity, pF	$C_D = 0.82S$
Capacitor potential, volts	$V_C = \sqrt{PX_LQ}$

where
f = operating frequency, MHz
A = area of loop, square feet
S = conductor length, feet
d = conductor diameter, inches
η = decimal value; dB = $10 \log_{10} \eta$
P = transmitter power, watts

THE ROSE NETWORK

BARRY WHITE VK2AAB
28 REDGRAVE RD, NORMANHURST 2076

History

ABOUT 1985 WE READ ABOUT the operation of NET-ROM in the USA and decided to purchase some Eproms for VK2RPH and VK2RPN. These were installed and, after some initial problems, they worked well between Sydney and Newcastle. However, some amateurs did not like the method of identification and complained to DoTC.

After being instructed by DoTC to remove the two NET-ROM repeaters VK4RPH and VK2RPN, AAPRA cast around for another networking protocol that could be used by all amateurs.

One of the first we examined was TEXNET. Unfortunately this had the same problem as NET-ROM in that the packets displayed the same identification format as NET-ROM at the originator's end.

TCP/IC was in some use at the time, but as it could not be used except by those with IBM/clones and considering most of the money available was provided by the purchasers of C64 packages, and approximately 65 per cent of amateurs at that time used other than IBM/clones, it was not a practical option.

A bulletin which appeared in Australia referred to a networking system called Rose. The information indicated it might comply with DoTC requirements which at that time were in process of being formulated. Discussions with DoTC indicated the method of identification was satisfactory. Rose was then installed in HADARC's repeater VK2RPH.

Over the past three years much work has been done on the software to the point where good reliability has been achieved.

Hardware

Most Rose switches in Australia use the Paccom DR200 dual port controller, while overseas most installations use TNC2s, either as stand-alone switches or use two back-to-back TNC2s connected by a cable on the RS232 port.

AAPRA chose to use the DR200 because of better throughput speed and cost. Unfortunately, there were a number of hardware weaknesses in the DR200. Several modifications were devised, mainly to the reset circuit.

Six repeaters in Australia are using TNC2s and Tiny 2s with excellent reliability. The modified DR200s now give good service, although the reset circuit still has some sensitivity to noise impulses. Spurious resets do not cause failure of the switches' operation.

Successful tests at 19200 baud full duplex on the RS232 port have been conducted. With suitable modems and radios network speeds as high as this will give sufficient capacity for the foreseeable future.

Software

Callsigns and addresses are implanted into the eprom by the MAKEPROM.EXE program, together with txdelay, full duplex, connect texts, maxframe for each port etc. Applications programs are uploaded remotely and provide the following auxiliary functions:

Config: This application receives the configuration file and sets up the networking tables.

Heard: Provides a list of the most recently heard stations and enables stations in other parts of the network to ascertain which stations are currently on air and available for contact.

Users: Provides information on the amount of memory in use and who is connected to whom and which X.25 links are being used.

Info: This application sends to the user the information text uploaded with the configuration file. It also provides plain language text of reasons for disconnects.

Operational Sites

The following is a list of fully operational sites

VK2RPH	247600	Hornsby
VK2RPS	487100	Mittagong
VK2RAO-3	636500	Orange
VK2RTM	676000	Tamworth
VK2RPW	677700	Nowendoc
VK2RPL	668900	Lismore
VK2RET		Taree
VK2RMB	245000	Terrey Hills
VK2RDX	633600	Mt Bindo
VK2RPT	694700	Tumut
VK2RCC	684200	Coonabarabran
VK2RLO	689000	Mt Lookout
VK2RCH	665200	Coffs Harbour
VK2RPA	269200	East<->West
VK4RAT	772800	Townsville
VK6RPA	942120	Perth
VK6RAP	939750	Roleystone

Planned Rose Switches

VK2RSD*	442100	Nowra
VK2RPN*	492600	Newcastle
VK2RAW*	448500	Wollongong
VK2RAY*	602000	Albury
VK4RMK*	795700	Mackay
VK4RBD	793500	Blackdown
VK4RZC	744100	Maleny
VK5RAD*	800001	Adelaide
VK5RPK	870001	Kingston
VK5RPM*	870002	Mt Gambier
VK5RSV	812300	O'Hallorans
VK5RMC	850001	Mt Compass

*Equipment supplied but not yet installed.

The Eastnet<—>Westnet Link

In April 1990 we were made an offer we couldn't refuse. A communications company offered AAPRA and WAADCG a 1200-baud circuit between Sydney and Perth.

Licences for VK2RPA and VK6RPA were obtained, and each terminal was fitted with Rose switches UHF radios. These switches connect to the network as shown on the next page.

Network Capacity

Some comment has been made of the capacity of the existing Rose network and its ability to handle the required amount of traffic.

At present the network is able to handle satisfactorily the traffic on offer. Considerable traffic is passing through the Rose network between different parts of NSW and to Western Australia. BBS forwarding is occurring several times every hour, yet the circuit between various parts of VK2 and to VK6 is nowhere near full capacity. If, with time, greater capacity is needed, higher speed modems and full duplex may need to be employed. This will require significantly greater expenditure per site. If this increased demand was to be reflected throughout the network a very significant amount of money would be needed. If this expenditure was restricted to what may be considered "main trunk" routes at least 10 sites would need upgrading in New South Wales alone. If similar upgrading is to take place in Queensland and South Australia, another 10 to 15 sites would

eventually need large expenditure for equipment additions.

From where is this money to come? It will have to be raised from those who feel a worthwhile improvement will result, and at present there are not sufficient numbers feeling sufficiently constrained by the network to dig deep into their pockets.

How much money would be needed? Well, that is very difficult to answer, but the only figures I have been able to ascertain indicates that about $1500 to upgrade each of 10 sites in VK2 would be required. I have made rough estimates of expenditure, and my figures tend to confirm the $1500.

This is a very substantial amount of money just to upgrade the existing "mainline" sites. It should be remembered that the packet operators in the various clubs are in a minority.

AAPRA feels it is better to wait until it becomes certain which parts of the network will need upgrading and then spend the limited funds on that part. This may not only save money but also save work.

Future Developments

Most effort will be expended in extending the network into areas not at present served. The embryonic network in Queensland is expected to grow down the coast to Brisbane, as the clubs along this difficult long coastline begin to see the advantages of establishing a network. Significant funds from both AAPRA and the clubs will be needed to add to the seven AAPRA supplied digipeaters and DR200s installed in Queensland at present.

In South Australia, a modest start has been made on the Rose network which will include about eight switches.

Western Australia has a network of four Rose switches, which is currently being linked to VK2RAP to enable connection to the Eastnet<—>Westnet circuit. Additional Rose switches are to be installed in country areas.

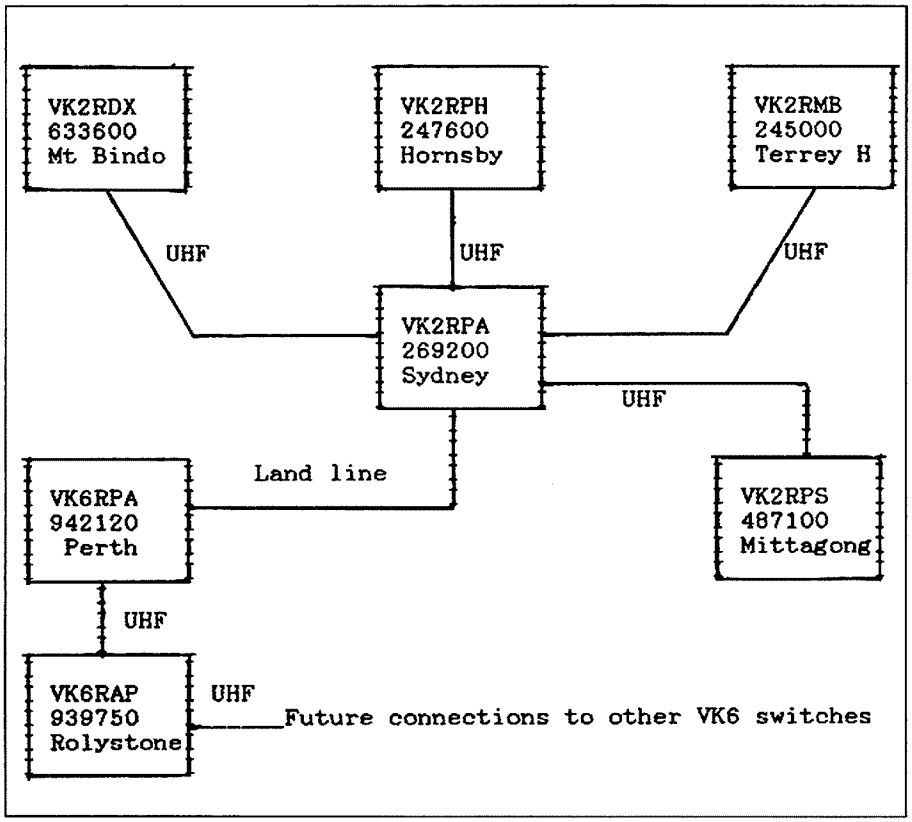
Connection by HF to overseas networks is not possible due to the current attitude of DoTC. There is, however, interest from the managers of networks in Central America and USA, but there are no currently operational HF networks on a permanent basis.

Software development of "Broadcast" modes and "Conference" facilities is in the works, but no timetable has been announced.

Addendum to Rose Network Development Document for Canberra Conference

HF Network Proposal

To connect together by means of VHF or UHF circuits the remote parts of the Australian packet networks would involve prohibitive costs. We cannot expect further windfalls of the nature of the Eastnet<...>Westnet link will occur. Also, the very large number of repeaters in the chain would slow the "round the loop" times by an unreasonable amount.



Therefore consideration should be given to the use of HF for the network. At present the DoTC will not permit HF networking,, but a reasonable case can be made for HF use. The packet community should make further requests of the WIA FE to make representations to DoTC on this matter.

The suggested modulation for such a system is PSK at 1200 baud. The success of the BBSs with this mode has been noted. The major decision to be made is the frequencies to be used. The following frequencies are suggestions only and would require a considerable amount of testing.

Australia wide coverage most daylight hours 18.110MHz.

Coverage 1500km range during most daylight hours 10.135MHz.

Coverage 1500km range during night hours 7.028MHz.

With HF network nodes in a number of locations around Australia the ability to route via alternative paths could overcome some unusable propagation conditions. It should not be expected that 100 per cent availability could be achieved. The signal levels required would be higher than that which is satisfactory for BBS operations due to the need for greater reliability of contact. This requirement comes about because of the expected realtime QSOs. Automatic QSY due to changing propagation would be very useful but not necessary initially.

The success of such a network would centre on the establishment of stations with the best practical antennas. In Sydney the WIA has indicated it would consider hosting such an installation at Dural. This would enable large fixed wire beams to be erected on the site. Antennas such as Lazy Hs, Sterba Curtains or Rhombics on the higher frequencies. Other groups may have difficulties with antennas of this type, but they do not need to be erected in major population centres. The HF network nodes could be installed anywhere within the remote network. Most packet groups throughout the country would have members who have suitable properties or could gain access to sufficient real estate to erect a large wire array.

The size of the antennas likely to be of use would require a ground area of approximately 150-200 feet in length and would give a gain of about 12dB. The top of the antenna would need to be about 50 feet high.

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WIA Divisional Bookshops

The following items are available to WIA members from Division Bookshops (see the WIA Division Directory on page 3 for the address of your Division

	REF	Price
ANTENNA BOOKS		
AnL Compendium Vol 2 Software only	BX293	$18.00
Antenna Compendium Vol 1 ARRL	BX163	$19.80
Antenna Compendium Vol 2 & Software ARRL	BX294	$32.40
Antenna Compendium Vol 2 ARRL	BX292	$21.60
Antenna Handbook - Orr - 1988	BX217	$15.60
Antenna Impedance Matching - ARRL - 1989	BX257	$27.00
Antenna Note Book W1FB - ARRL - 1987	BX179	$18.00
Antenna Pattern Worksheets Pkt of 10 - ARRL	BX211	$5.40
Antennas 2nd ed John Kraus - 1988	BX259	$93.60
Beam Antenna Handbook - New ED. 1990 Orr	BX215	$17.40
Cubical Quad Antennas - Orr	BX214	$13.10
HF Antennas - Moxon RSGB - 1988	BX188	$27.00
Novice Antenna Notebook DeMaw - ARRL	BX162	$14.40
Practical Wire Antennas - RSGB	BX296	$25.20
Reflections - Software 5 inch disk	BX358	$18.00
Reflections - Transmission lines The Book - ARRL - 1990	BX348	$36.00
Smith Chart Expanded Scale PK of 10	BX903	$5.90
Smith Charts S/Scale 1 SET co-ord Imp/Admir Pack of 10	BX901	$6.10
Smith Charts Stand Scale1 SET Co-or. PK of 10	BX900	$5.90
The Antenna Handbook - ARRL 1991 edition	BX370	$36.00
The Truth About CB Antennas - Orr	BX219	$15.60
Transmission Line TransformersARRL 2nd Edition - 1990	BX329	$36.00
Vertical Antenna Handbook - Lee - 1990	BX284	$16.70
Vertical Antennas - Orr - 1988	BX220	$14.30
Yagi Antenna Design - ARRL - 1986	BX164	$27.00
ATV BOOKS		
The ATV Compendium - BATC	BX270	$14.20
The Best Of CQ-TV - BATC	BX273	$14.20
FICTION		
CQ Brings Danger - ARRL	BX206	$9.40
CQ Ghost Ship - ARRL	BX204	$9.40
Death Valley QTH- ARRL	BX205	$9.40
Grand Canyon QSO - ARRL	BX207	$9.40
Murder By QRM - ARRL	BX208	$9.40
SOS At Midnight - ARRL	BX209	$9.40
HANDBOOKS		
1991 ARRL Handbook	BX337	$47.60
Electronics Data Book - ARRL - 1988	BX201	$21.60
Motorola RF Device Data - 2 Volumes	BX047	$22.10
Radio Communication Handbook - RSGB	BX266	$50.40
Radio Data Reference Book - RSGB - 1985	BX189	$32.40
Radio Handbook 23rd edition - Bill Orr	BX224	$53.90
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GETTING STARTED WITH AMATEUR RADIO SATELLITES

PART 10
BILL MAGNUSSON VK3JT
359 WILLIAMSTOWN RD, YARRAVILLE 3013

Finding your bird, or "don't let that computer intimidate you"

A FAMOUS ENGLISH CHEF ONCE published a recipe for beef consommé which began "First slaughter your ox". His philosophy is also true of amateur satellite operation. First you have to find your satellite. It's no good having the best equipped station in the galaxy if you don't know exactly where the bird is, or when it's due to appear in your sky.

I was recently looking over some material I downloaded from a local BBS in 1990 regarding the NASA space shuttle SAREX mission. I was amazed by one of the "instructions". They appealed to users not to call the shuttle unless it was above their horizon. At first this seemed to be quite a bizarre thing to say. Surely no one would be silly enough to just call indiscriminately, hoping to get a contact. But yet, apparently some people do. I wish them luck, but I hope those of you who have been following this series would realise there's a bit more to it than that.

Looking at the scene today it's hard to imagine that much of the early development of the amateur radio satellite program happened in the days before the home PC became as commonplace as TV and hi-fi sets. But it did.

At the time when project Oscar Australis (the Oscar-5 package) was being developed and built in Melbourne, computers were huge and clumsy by today's standards. They existed only in universities and large commercial and government organisations.

What changes we've seen in those few years! What would those early pioneer engineers and amateurs have given for an IBM486? Well, they had to make do with what they had at the time. We amateur users had to do much the same.

"Tracking" of satellites in those days was done using devices like "Oscar-locator" which consisted of a world map, usually polar projection, and a transparent plastic overlay. The overlay showed what we now call footprints of the various satellites, and by positioning it on the map we could have a pretty good guess at when the satellite would come up over our horizon.

It involved establishing an equator crossing time and longitude and then extrapolating that into the future. The modern-day amateur satellite user eagerly awaits new sets of kep elements to update computer programs; in the early days we looked for new sets of EQXs (equator crossing data). Oscar-locator and similar devices are still produced and are useful if you don't want to devote a computer to the task of finding your satellite. They have serious limitations though, particularly with highly elliptical orbits.

All the amateur satellites at that time were in near polar, near circular orbits so, elementary as it was, the system worked. It still does. Quite a few weather satellite enthusiasts use this method, leaving their computer to produce the pictures.

Although you had a pretty good idea of when the satellite would come up and go down, exactly where it was in the sky during a pass was largely a matter of guesswork. Some clever electro-mechanical systems were devised to cope with this, and good QSOs and telemetry reception were common. I'll never forget our excitement when Brian VK3BLW came across a copy of a brand new computer program called Basic Orbits by Dr Tom Clark W3IWI. Brian had access to a computer and was able to produce what to us at the time were unbelievably accurate printouts of the passes of Oscars 6, 7 and 8.

Things moved along rather quickly from that time, and it wasn't long before affordable home computers became available. Dick VK3ARR and I built a Microbee from a kit, but not being able to afford or acquire a printer we scribbled down the data for our early satellite mountaintop expeditions. Later on, Dr Karl Meinzer DJ4ZC, the designer of Oscar-10, devised an excellent compact program for use in the "Sharp" range of pocket computers. This was a great boon to portable DXpedition stations and newcomers not wishing to outlay $2000 or more on a PC. Many amateurs learned the elements of basic programming by studying the routine listings in these little computers.

A PC these days is considered to be an essential part of any satellite station, and that brings us to the subject of this article. What mysterious things go on inside a computer that can turn a set of keplerian elements into look angles for pointing our antennas? A lot of people regard these goings-on as magic. They're not. A computer used in this way is doing its simplest and most basic task. It is being used as a lighting fast calculator. It can perform a wide range of complex mathematical tasks in a logical, preset order to come up with answers in a few seconds that would take hours or days of calculations on paper. It doesn't take time off for a cuppa, and it doesn't make mistakes. It's a fair bet that if you get the wrong answer from a computer then YOU made the mistake.

There's a very true saying regarding computers and their operation. "Rubbish in, rubbish out". The computer will perform its tasks diligently, but it will not make assumptions. If there's an error in the logic of your program or if you enter some silly data, the computer will work on it as instructed. Its operating system, whether CP-M, ROM-based or DOS, will carry on regardless. Its output may be meaningless to you, but it will be correct as far as the computer is concerned. You have to be very careful when updating kep elements and other data and entering the input information the computer requires. Clever programmers include routines to exclude ridiculous data, but you still need to be careful.

The keplerian elements discussed last month express the satellite's position relative to the earth and the stars using angles measured from the centre of the earth (the geo-centre). We aren't operating from the centre of the earth, but the computer program sets out first to calculate the satellite position relative to this

point. Then it calculates the position relative to your particular latitude and longitude. Of course, your program has to be supplied with this data. Survey maps of your area or your local airport or shipping terminals are good sources.

To find the satellite's position around the orbit path the program uses the mean anomaly at epoch time, adds the number of complete orbits since that time (with an adjustment for drag), then adds the fraction of un-completed orbit. This establishes a new "present time" mean anomaly (ie, where it is around the orbit right now). American programs call this the PHASE. I find this term a bit misleading.

Now, according to Kepler's reckoning, the earth lies at one of the foci of the orbital ellipse. Remember the foci? They're like the centre of a circle, but an ellipse has two of them. It's more correct to say the centre of mass of the "earth + satellite" is exactly at one of the foci, but in the case of the earth, which is very, very large, and a man-made satellite, which is very, very small by comparison, it can be assumed the earth's geo-centre is at one of the foci.

Incidentally, this assumption is one of the reasons why many tracking programs will not track the moon. The moon is very large compared with a man-made satellite. So large, in fact, that as well as the moon orbiting the earth, it could be said the earth actually orbits the moon to a degree. They sort of waltz around each other, a bit like a binary star. The moon is really too big to be a satellite of earth. But that's another story. The focus that should be close to the geo-centre of the earth is, in fact, just under the earth's surface directly below the moon.

Quite complicated equations are necessary to resolve this situation, and many programs don't take the trouble. James Miller G3RUH was the first to grapple with this problem, and his SATFOOT program will track the moon to an accuracy of a few minutes of arc. I'm often asked for a set of kep elements for the moon. There's really no point in putting them in unless the program has the necessary calculation routine (and, if it did, then the kep would already be there).

All man-made satellite orbits are affected to a greater or lesser degree by the gravitational pull and motion of the moon. Fortunately, for our purposes, these effects are very small and can be neglected.

Elliptical equations derived from Kepler's laws are employed to calculate the sub-satellite point. This is the point on the earth directly below the satellite on a line from the satellite to the geo-centre.

The elements' eccentricity, right ascension of ascending node, argument of perigee and inclination are used. With the exception of the eccentricity, these are angles and are expressed in degrees. Problem!! Computers don't usually work in degrees, so all angles need to be converted to radians. Fortunately this is one of the things computers can do easily. When calculated, the sub-satellite point comes out in celestial co-ordinates and it's finally converted by the program into earth co-ordinates (latitude and longitude) in respect to the poles, equator and Greenwich. We now have the new mean anomaly and the sub-satellite point co-ordinates. Try doing **that** with pencil and paper!

During these calculations the distance from the geo-centre to the satellite has been worked out. This is useful later in establishing the range from observer to satellite and the satellite's height above earth. Some programs included these in the printout.

The program has now pinpointed your location in latitude and longitude and the satellite's position around its orbit. It looks at these points from the centre of the earth and does a series of trig rotations to establish the satellite's position relative to the observer. It uses the earth radius, the observer's lat/long, the sub-satellite lat/long and the satellite's distance from the geo-centre at the new mean anomaly. Good programs will take into account the oblateness or out-of-roundness of the earth when using the earth radius in this way. It varies from place to place, you see. Some programs don't worry about this, but it is important enough for better programs to take it into account.

The "look angles" are a result of these calculations. The look angles are, of course, the elevation and the azimuth. Elevation is measured in degrees **up** from the observer's horizon (0 to 90 deg). Azimuth is measured in degrees **east** from true north — beware **not** magnetic north — at the observer's location (0 to 360 deg).

As far as tracking the satellite is concerned, that's all we need to know. We can use the look angles to point our antennas. With a suitable electro-mechanical interface the computer can even do this for us. All we need do is keep those kep elements up to date. By the way, the higher the gain of your antenna system, the more particular you have to be in keeping the kep elements current. Can you see why? If you got that one right, can you see why current keps are even more important for the very low orbit satellites?

Now, back to business. Along the way, the program has already calculated some other things which can be useful, so most programs don't just leave it at that.

The new mean anomaly, for example, can be used in conjunction with a transponder schedule to tell us which transponder or beacon is turned on at any time. The transponders or operating schedules are switched at certain points in the orbit, on at MA23, off at MA217 etc. If your program has this feature then you will have to keep the transponder schedule up to date. Your program will contain details of how to make these changes. Given the correct data it requires only a simple **if then** logic statement for the computer to decide what's on or off at any time. Computers are good at logic.

The sun's angle relative to the satellite is important in illuminating the solar cells and designing the transponder schedule.

The sun angle is calculated along with look angles using RAAN etc, above. Satellite eclipses and visibility can be predicted using sun angles. Some programs print these out along with other data.

If the satellite's attitude (ie where its antennas are pointing) is known relative to the orbit path, then the squint or off-pointing angle can be calculated in respect to the observer's location.

This is done by expressing the elevation angle from the satellite's perspective and adding in the satellite attitude angles. James Miller's plan-10 program was first to incorporate this very important calculation in the early 1980s.

Most modern programs now feature this calculation. Once again you have to update the attitude data. Attitude is expressed using the Bahn co-ordinate system. The angles BLON and BLAT (pronounced beelon and beelat) are used to fix it relative to the major axis and plane of the orbital ellipse respectively. BLON 180 and BLAT 0 means that the antennas are pointing at the centre of the earth when the satellite is at apogee. (Draw a little sketch to prove this one to yourself).

Most squint angle calculations assume the satellite is spin stabilised and therefore permanently pointing at star "X". Some amateur satellites, however, are three-axis stabilised, and the antennas are permanently earth pointing.

The UoSats and the proposed phase 3D and French Arsene are examples. Some programs contain a routine to take this into account and provide squint angle information for three axis stabilised satellites.

The range is calculated along with look angles as some of the distances involved come out as part of the trig solutions.

To be continued next month

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EQUIPMENT REVIEW
THE AMERITRON AL-811 HF LINEAR AMPLIFIER

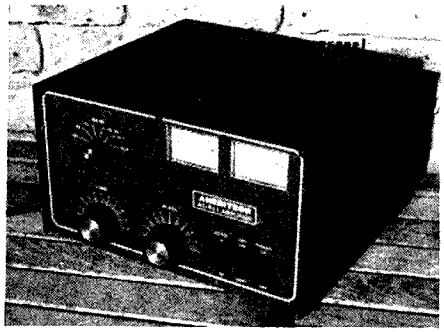
RON FISHER VK3OM.
GAALANUNGAH
24 SUGARLOAF RD, BEACONSFIELD UPPER 3808

IF YOU ARE IN THE MARKET for an HF linear amplifier, you will find a rather limited selection at the present time. Not only that, those that are available tend to be very expensive. If your budget runs to $3000 plus, there are a few nice solid state and valve final units available. But what about a conservative 400 watts for $1449? Sounds good? Well let me tell you all about the AL-811. Firstly, it is imported by that go-ahead firm of Stewart Electronic Components.

But, first let's go back a few years. It was in November 1939 that the RCA Manufacturing Co first announced the arrival of the new 811 power output triode valve at the bargain price of only $3.50 each. Actually, the 811 was designed primarily as a class 'B' audio tube and the companion 812 was the one to use in the transmitter final stage. Both tubes had the same power rating but the 811 had a higher amplification factor making it very suitable for class B operation. Of course in those days, single sideband transmission was all but unknown on the amateur bands, although it was in limited use in commercial radio applications. Probably not initially realised by the RCA Tube Co, the 811 would in time make a very suitable SSB linear amplifier. Well 52 years on,the 811 is still with us, now made in China, and has been chosen by Ameritron for its latest linear amplifier. The AL-811 (you can now see how it gets its name) actually uses three 811A valves in parallel as a grounded grid class AB2 amplifier for both SSB and CW modes. The 811A valve, incidentally, is an upgraded 811 that was introduced in the early post-war years, with the plate dissipation increased from 55-65W but otherwise unchanged. So much for the historical side of things, let's now have a detailed look at the AL-811.

The AL-811 Technical Details

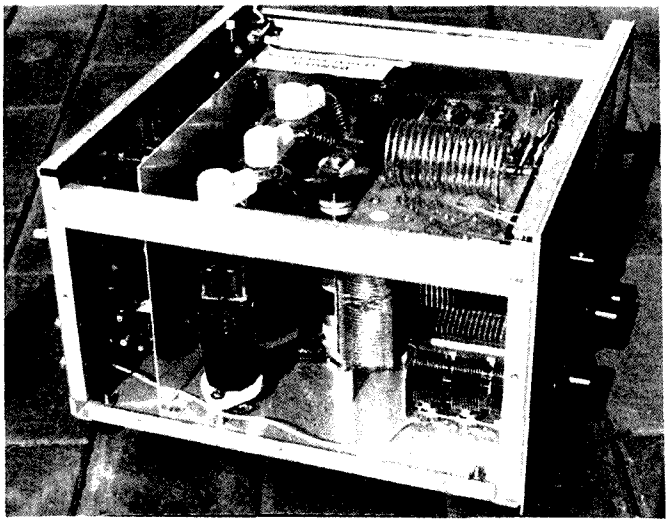
The AL-811 is a large black box. It is actually somewhat higher, narrower and deeper than most contemporary equipment. It measures 20cm high, 35cm wide and 40cm deep and weighs in at 13.6kg. Of course this is an all-up weight that includes the heavy duty power supply, but even so, is some 6.5kg less than the popular Yaesu FL-2100Z amplifier. The three 811As are in a grounded grid circuit with the drive from the exciter going into the valve filaments through a separate pi-network for each of the six bands. These are 160, 80, 40, 20/30, 15/17 and 12/10 metres. One of the interesting features of American made amplifiers or for that matter amplifiers imported into the US, is that they are not permitted to include the 10m band. This is to to stop their use by CB operators on 27MHz. I am not sure this actually stops them being used on the CB band, as in most cases mods to put them on 28MHz (and 27MHz) are quite easy. The AL-811 has been factory 'modified' for 10 and 12m operation but this leaves a strange legacy. The 10m position of the band switch is labelled 'AUX'. Once you get used to this, everything becomes straight-forward. Anyhow, back to the circuit description. The power supply uses one transformer to supply power to all circuits. The primary side is tapped for inputs from 100 volts to 240 volts, and these adjustments are made through a removable panel at the back of the amplifier. A bridge rectifier provides 1700 volts output on no load and 1500 volts on full load. Four series connected 210µF capacitors filter the output. A good picture of the internal construction can be obtained from the illustrations. Most of it is on two very large fibreglass printed circuit boards, the first carrying the tank coil winding, with the power supply components at the other end. The second board, mounted near the rear of the cabinet, contains the input Pi-network circuitry and the AC input wiring. The three 811As are mounted vertically in high grade ceramic sockets. Two excellent panel meters give readings of total grid current on one, and either plate voltage or plate current on the second. Both are brightly illuminated and are very clearly calibrated. Front panel switching, apart from the band switch, is for AC power on/off, standby/operate and the meter switch. A red LED indicates when the amplifier is in the transmit mode. There are two tuning controls, one for plate tuning and the second for loading. The plate tuning has a six-to-one vernier control fitted for easy setting. Finally, there is an ALC output to feed back to the driver transceiver to prevent excessive drive power being applied. As we shall later see, this is a most important feature. Cooling is well taken care of with a 20CFM fan fitted on the rear panel.



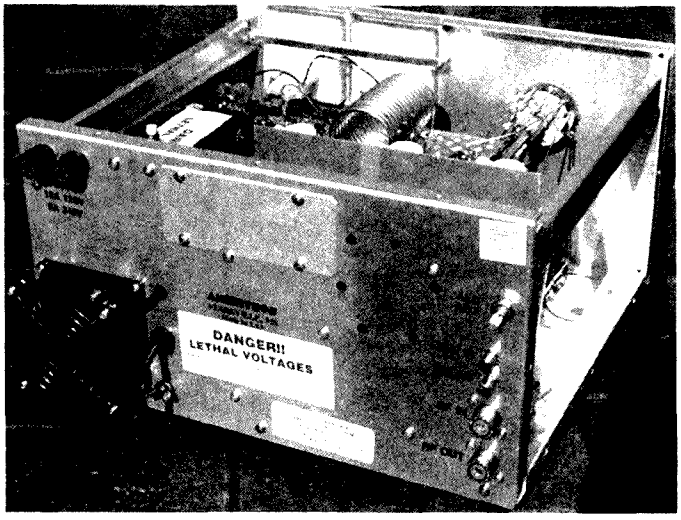
Front view of Ameritron AL-811

The AL-811 On The Air.

Connecting up the amplifier is a straight-forward procedure. Standard SO-239 sockets are provided for both RF input and output. Relay switching and ALC output are via RCA (often called phono sockets) connectors. Setting up with most transceivers should only take a few minutes. All of my tests were done with an ICOM IC-745 transceiver as the driver rig and RCA connectors are provided on it for both relay control and ALC input. To tune up, set the band switch to correspond to the exciter, apply a small amount of drive (exciter in CW or AM mode to give steady carrier) and rapidly



Internal View



Rear view of the AL-811. Note high volume blower at lower left. The six holes at top right allow access to adjust input tuned circuits. Unfortunately they are not identified.

tune the plate and load controls for maximum output. To do this you will need an external power meter as no output metering is included in the amplifier. Increase the drive from the exciter until maximum output from the amplifier is achieved without exceeding 150mA grid current. And there you have it. Four hundred watts output is obtained in most cases with about 75 to 80mA grid current and about 35 to 40 watts driving power. This should produce a clean signal with most transceivers just loafing along. However now is the time to set up the ALC. Again, it is best to do this with steady carrier feeding the output of the amplifier into a dummy load (you always do don't you?). Increase the drive from the transceiver until you reach maximum output (about 550 watts) then set the ALC adjust on the back of the amplifier for 400 watts output power. In actual fact this was not straight-forward and it was necessary to compromise the output power to an average of 400 watts. I finished up with a maximum output of about 450 watts on the lower frequencies down to about 350 watts on 10 metres. If you settle for 400 watts on the lower bands then the output will be around 300 watts on 10. In operation, the amplifier ran quite cool with just warm air being blown from the cabinet. Plenty of space is required at both the rear and side of the cabinet, so as not to impede the flow of air.

The AL-811 On Test.

For test purposes, I set up the following: Icom 745 transceiver as the driver, a power/SWR meter in the line to the AL-811 and another power/SWR meter between the amplifier and a 50 ohm dummy load. Table 1 shows the resultant figures.

Band MHz	Power Output	Power Input	Grid Current	Drive Power	Input SWR Amp On	Through SWR amp Off
1.8	400	637w	75	30w	1.1-1	1.1-1
3.5	400	712w	75	35	1.1-1	1.1-1
7	400	765w	75	40	1.2-1	1.1-1
10	400	750w	80	50	2-1	1.1-1
14	400	675w	78	30	1.2-1	1.2-1
18	400	840w	80	40	2-1	1.2-1
21	400	875w	82	42	3-1	1.2-1
24	400	820w	85	40	2-1	1.2-1
28	400	805w	90	40	1.5-1	1.2-1

This chart shows the relative performance of the AL-811 on each band. These figures were taken in the CW mode with the power output adjusted to 400 watts. The input SWR on 21MHz at 3:1 is of some concern. It should be noted the input tuned circuits are adjustable but, as the photo shows, these are not identified on the back panel of the amplifier. This makes the adjustment procedure a bit hit and miss.

In each test, the power was set to 400 watts output. On most bands, this was achieved easily, but on ten metres 400 watts was only just reached. The high input SWR on some bands is of concern but, nonetheless, the IC745 was able to drive the amplifier to our power limit. An interesting point is that the SWR looking through the amplifier (amp on standby or actually switched off) was very low. Some linears are not. I do not run to the luxury of a spectrum analyser to check the intermodulation distortion, but the RCA Transmitting Tube Manual quotes a single 811A in class AB2 with 1500 volts HT and a power output of 160 watts PEP giving -25dB for third order and -30dB for fifth order distortion. This is referenced to either of the two tones in a standard two-tone test. For normal PEP speech an extra 6dB needs to be subtracted (ie. -31 and -36dB). This is a satisfactory figure although not up to what can be achieved these days. It is, however, about as good as can be expected from most 12V powered solid-state finals. In other words, the signal should be as clean with or without the amplifier. Running at 400 watts output should produce a somewhat cleaner output from both the exciter and the linear amplifiers, by virtue of the fact that each output is operating below IMD specified power.

The AL-811 Conclusions

There is no doubt, the AL-811 linear amplifier is in a class of its own. It is possibly the only linear available that suits the Australian power output limitations almost exactly. It is easy to use, stable in operation and attractive in appearance. And last, but by no means least, the price is right. The instruction manual is also well presented and covers both operation and circuit information. A full circuit diagram and parts list is included.

However, the very best I have left until last. Most amateurs know only too well the price of replacement tubes for their linear amplifiers. A full set of tubes for the AL-811 will cost you a total of only $105. I know that's a bit more than the 1939 price, but still only about a third of the price of a pair of 572Bs for instance. Not too bad for these days.

My thanks to Stewart Electronic Components Pty Ltd of Huntingdale, Victoria for the loan of the AL-811 linear amplifier. Stewart is sole agent in Australia for AMERITRON.

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Mobile Excellence

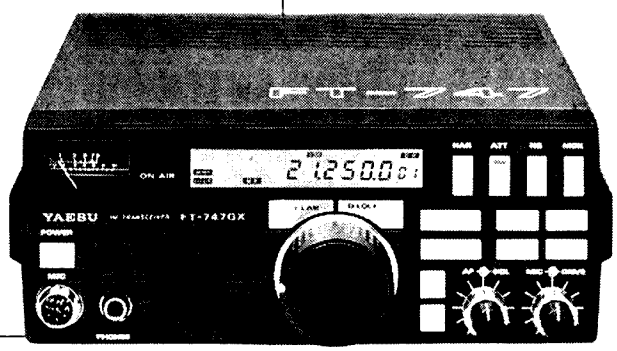
2 YEAR WARRANTY!

FT-747GX BUDGET H.F. TRANSCEIVER

The FT-747GX is a compact SSB/CW/AM and (optional) FM transceiver providing 100 watts of PEP output on all 1.8-30MHz amateur bands and general coverage reception from 100kHz to 30MHz. Convenience features include a front panel mounted speaker and unobstructed digital display, dual operator selectable tuning steps for each mode, dual VFO's for split frequency operation and 20 memory channels (eighteen of which can store spilt Tx/Rx frequencies). Wideband 6kHz AM, and narrow 500Hz CW IF filters are also fitted as a standard feature. Includes Yaesu MH-1 hand microphone. See ARA Review — Vol 11, Issue 11.

Cat D-2930

$1199



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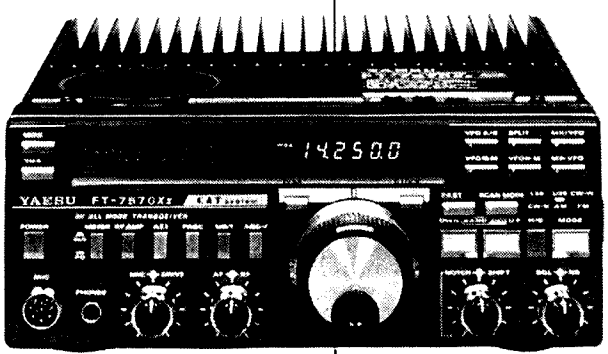

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- All mode operation — SSB, CW, AM, FM(160m-10m)
- 100 watt output on SSB, CW, FM (25W AM) at 100% duty cycle
- High performance general coverage receiver — 150kHz to 30MHz
- Dual VFO's with single button VFO/memory swap functions
- Memories store freq. and mode, plus allow band scanning between adjacent memories
- Inbuilt 600Hz CW IF filter, IF shift and IF notch filters, variable noise blanker, Speech Processor, iambic CW keyer, and SWR meter. Includes MH-1 hand microphone.

Cat D-3492

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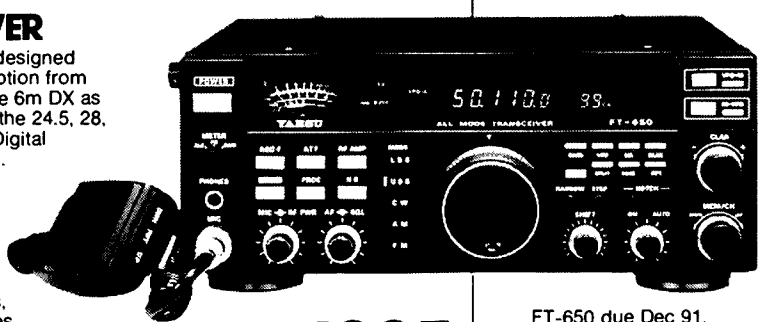
Cat D-3250



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Frequency: 144 —148MHz
Gain: 7.8dB
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 4.53m
Type: 3 x 5/8λ co-linear
Cat D-4850

$199

2m/70cm ANTENNA X-200A

Frequency: 144 — 148MHz, 430 — 450MHz
Gain: 6dB on 2m, 8dB on 70cm
Max. Power: 200W
Max. Wind Speed: 180km/h
Length: 2.5m
Type: 2 x 5/8λ(2m), 4 x 5/8λ(70cm)
Cat D-4860

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2M/70cm ANTENNA X-500A

Frequency: 144-148MHz, 435-450MHz
Gain: 8.3dB on 2m, 11.7dB on 70cm
Max. Power: 200W
Max. Wind Speed: 144km/h
Length: 5.2m
Type: 3 x 5/8 λ(2m), 8 x 5/8 λ(70cm)
Connector: N-type socket
Cat 0-4865

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Frequency: 1260 — 1300MHz
Gain: 13.5dBi
Max. Power: 100W
Max. Wind Speed: 144km/h
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Type: 25 x ½λ co-linear
Connector: N-type socket
Cat D-4870

Limited Stocks!

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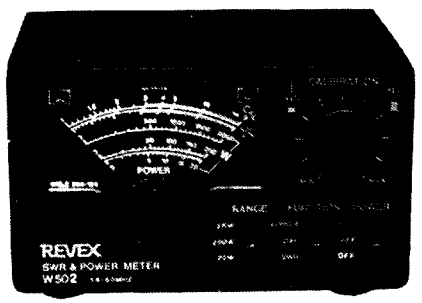

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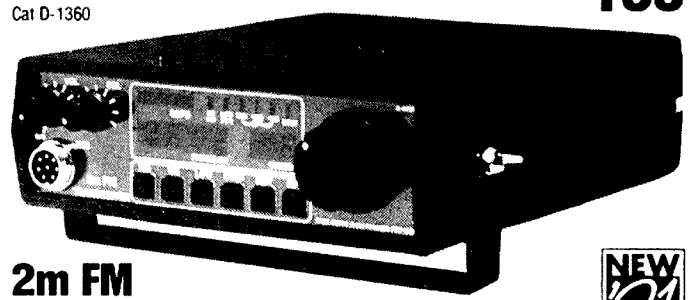

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NEW '91

This outstanding high performance FM transceiver can be used as either a mobile or base station on the 144-148MHz amateur band. It must be one of the easiest transceivers of its kind to build yet it comes loaded with advanced features like....

- Full PLL frequency synthesis
- 24 memory channels which store repeater shifts
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- Microprocessor control system
- Excessive SWR safety shut-down circuitry
- 0.15uV typical sensitivity at 12dB SINAD
- 30kHz selectivity at -60dB
- -60dB image rejection

At this price you can afford to take the challenge! Kit includes all components, hardware, heatsink, detailed construction and testing information, and a pre-punched silk screened front panel. Microphone is not supplied. YAESU D-2110 or D-2105 are recommended.
Cat K-6400

EA Jan, Feb, Mar '91

Only $399

2m ½ WAVE RASE STATION ANTENNA

An outstanding value for money, compact, Australian made base station antenna which is only 1.69m long. It uses a single section F.R.P. radome for excellent all-weather operation and covers 144-148MHz with less than 1.5:1 SWR. The antenna provides approximately 3dB gain with a maximum power handling of 200W FM. It's fitted with an SO-239 socket mounted into the base for easy coax connection and comes with a 5 year warranty.
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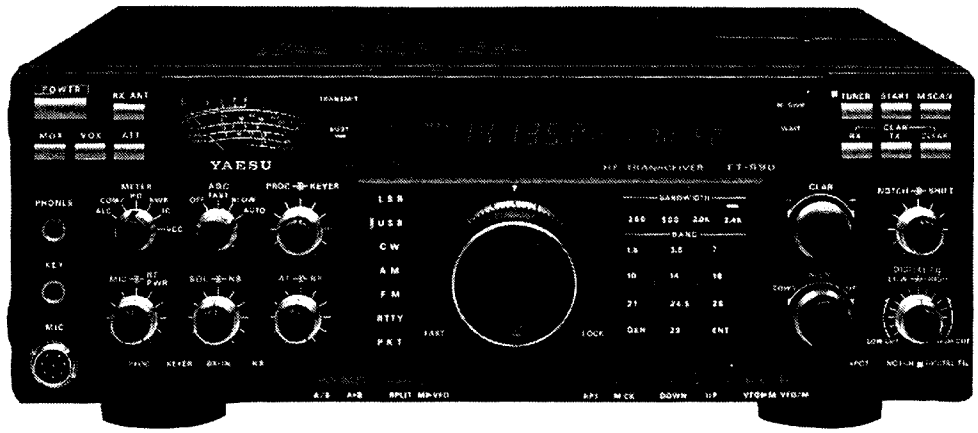

Designed For Easy Operation

Just like the FT-1000, Yaesu have designed the FT-990 to be as easy as possible to operate. The front panel layout puts all frequently used controls right where they should be..... at your fingertips. All controls are clearly labelled and the digital display provides an abundance of information in an uncluttered and easy to read format. The front panel keypad offers one-touch band selection (160m - 10m) with 2 independent VFOs per band and 90 memories that store the operating data held in both VFOs. You can't help but appreciate the large back-lit analogue meter rather than those confusing bar-graph meters found on other transceivers.

Direct Digital Synthesis (DDS)

Two 10-bit DDS and a magnetic rotary encoder provide silky-smooth VFO tuning, pure local oscillator signals, and very fast Tx/Rx change-over... and that's very important for QSK CW and digital modes. The DDS is teamed with an extremely low-noise, high performance receiver front-end using a PIN-diode controlled push-pull RF amplifier followed by a quad-FET ring mixer. The result is a very wide receiver dynamic range from 100kHz to 30MHz. Transmitter signal purity is also enhanced, with circuit noise nearly 90dB down from the carrier.

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Convenience Features

- A highly efficient AC switch-mode power supply is built-in! It allows high duty-cycle transmission while keeping the weight way down, saving space and the added expense of external power supplies.
- An in-built Automatic Antenna Tuner with 39 memories is standard!
- Modular construction maximizes selectivity and makes servicing easy.
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- An adjustable noise blanker, a 500Hz B/W IF crystal filter and a comprehensive, easy to read user manual are also supplied.

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RANDOM RADIATORS

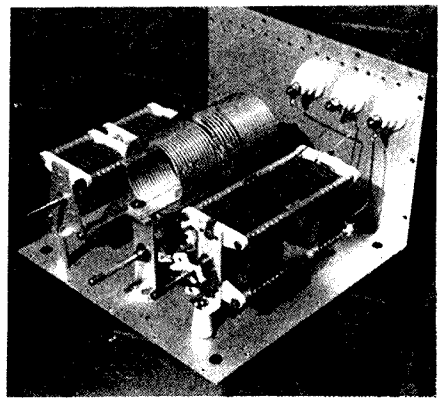
RON COOK VK3AFW
RON FISHER VK3OM.

ATUs And the Two Rons.

I GUESS THAT BY NOW most of our readers have probably formed the impression that the two Rons use "Z" Match ATUs and won't have a bar of anything else. That is, in fact, not quite true, and in a moment I intend to describe an ATU that has been in use in one of the Rons' shacks for well over 25 years. It is, in fact, the only piece of equipment to survive anything like that period of time in his shack, so it must have something going for it. Of course ATUs have a place in some applications and not in others. As we have pointed out in the past, the "Z" Match comes into its own for coupling into balanced feed antennas although it is quite capable of matching low impedance unbalanced lines. Most commercial ATUs, including automatic ATUs that are built into many current model transceivers, are designed to match unmatched coax lines or, in other words, to extend the usable band width of narrow band antennas. If you find you can get along happily without an ATU, don't feel left out. You are probably doing as well or better than your friend who has the latest all singing and dancing (39 memory) ATU.

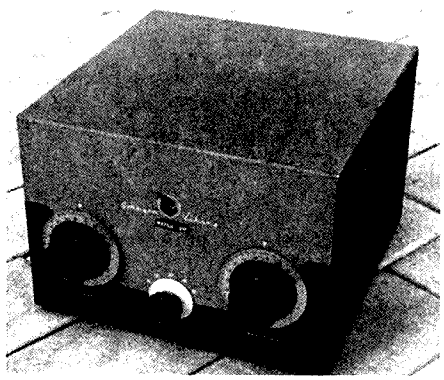
The Johnson Viking Matchbox Antenna Coupler

During the '50s and '60s, the E F Johnson Company of Minnesota USA produced a wide range of amateur equipment. Many of their transmitters were available in kit form and were generally better quality than Heathkit equipment available at about the same time. Unfortunately, not a lot of Johnson equipment got to Australia as during that period we had very stringent import restrictions. However, in 1957, I was lucky enough to obtain a 275W Matchbox from a Victorian amateur who had imported several from the States. Well, what's so special about a Johnson Matchbox? Firstly, like the "Z" Match, it was designed primarily for use with balanced feed antennas, although it was quite possible to use it with mismatched coax lines. It was bandswitched for the 80, 40, 20, 15 and 10m bands but nevertheless has enough coverage to tune the new WARC bands as



Internal view of the Johnson Matchbox — the left-hand capacitor is the dual differential unit discussed in the text.

well. It was produced in two versions, one rated at 275 watts input to the final amplifier using AM, and the other rated at 1000 watts input on AM. In those days, transmitters were always rated for input power to the final amplifier. We were never too sure just how much power we were getting out. Anyhow, 275 watts input on AM equates to about 600 watts PEP output on SSB and a glance at the capacitors used indicates this would be a fairly



The famous Johnson Matchbox ATU.

conservative estimate. The circuit was simple as can be seen but even an experienced home brewer would be hard pressed to duplicate it. The problem for our constructor is the dual differential output capacitor. This was made especially for the Matchbox by Johnson and consists of two split stator capacitors mounted one above the other with a common rotor. Each section had a capacity of 100 pF. With the balanced feeders connected to each rotor, the capacitor effectively provided a capacitive impedance divider. The actual tuned circuit was a normal parallel-tuned bandswitched inductance with a link coupling coil in the centre. The split stator tuning capacitor was 100pF per section.

The link coupling was unusual in that it provided for 50 ohm input from the transmitter and 50 to 300 ohm output to a receiver. This was of course in the days before transceivers and many receivers had a 300 ohm input. Even an antenna change over relay is included although it is now shorted out for use with a transceiver. The matching specification is 50 to 1200 ohms for balanced lines and 50 to 2000 ohms for unbalanced lines.

In practice I find that it doesn't have quite the range of Matching the "Z" Match has, but of course, handles 400 watts PEP, which the "Rononymous" "Z" won't. In addition it proves that technology of the 1950s is still very usable in the 1990s. I hope to be using my Matchbox for many years yet and if you see one come up in Hamads, grab it quickly, you won't be sorry. By the way, it won't be mine!

More on Small Transmitting Loops.

The inimitable Lloyd Butler VK5BR came up with a few calculations on the loop described in this column a few months ago. Over to Lloyd.

I note your sample of the Small Transmitting Loop in Random Radiators July issue. With the design information from Ted Hart and the benefit of my own practical experience, I believe I can reliably predict how it can be expected to perform. You might like to add the following information to your Random Radiators column so that readers have an idea what they can expect and not expect.

Using the dimensions given, the maximum possible aerial efficiency (ignoring tuning capacitor loss) is as follows:

7	MHz	5.6%
10	MHz	17%
14	MHz	42%
21	MHz	73%
28	MHz	89% (If tunable)

With these efficiencies, performance can well be expected to be as good at 21 and 28MHz as a full size wire antenna. (Resonance at 28MHz should be possible but you will only need 3 or 4 pF of tuning capacitor

across the loop.)
Performance at 14MHz will be not quite as good, perhaps an S point below the full size antenna. This can be improved if the copper pipe is increased to 3/4-inch diameter to lower the loss resistance and improve the efficiency.
The loop can be used at 7 and 10MHz but the signal put out from it will be well down on the full size wire antenna. For any significant improvement at these frequencies, you must increase the area of the loop.
I do not believe that the manually operated tuning shown is a proposition. The high Q loop has very narrow bandwidth and must be retuned for a frequency shift of more than a few kHz. It is highly susceptible to de-tuning when you get close to it with your body or hand. Remote controlled motor tuning or a tuned line system, as I have described in my own article, is a necessity.
Incidentally, if you find your loop is not sharply tuned, this indicates too high a loss resistance and poor radiation efficiency.
In the articles I have read, not a lot has been said about the gamma match used and how its adjustment is affected by a band change. However, from my own experience using the delta match (which after all is only a balanced gamma), I feel sure the matching tap will have to be reset when changing bands.
My own experiments have been carried out with the loop close to the ground and this has produced good results. In general, the radiation angle of antennas can be controlled by the height above the ground. What I don't know is how the loop performance is affected by its height. Finding this out might be a task for someone else who has a mast with halyard all of non conducting material or has the means to haul up the loop in space between two masts.

First of all, please note that this not the April issue. This very interesting, thought provoking article was written and supplied to us by Dave Gibbons VK1GD. Thanks for the idea, it just might be an ideal antenna for those operating from retirement villages and the like where no antennas are permitted.

Tree Antennas — Organic Operating
BY COURTESY OF JACK VK2NBZ

It has been reported that during WW2, in Burma, some enterprising signallers discovered that natural foliage made a very efficient radiator; just pick the biggest tree in your neck of the woods, drive in a nail, clip on the antenna, tune it against earth and away you go! The way this information came to me is now forgotten and had been mentally filed in the category of Probable Mythology ... However, I was surprised and delighted a few days ago to discover that the Treetenna is still alive and well when I was called by Jack VK2NBZ who is using one very effectively in Sydney.

His T/T is a 71 inch (not feet, inches!!) camellia, or, for the benefit of metricated members, 1803.4 millimetres. It is tuned against earth, a 4'6" piece of 1-1/2" diameter water-pipe embedded near its roots. He has operated it successfully on 80, 15 and 10m across Australia and New Zealand and his pride and joy has been a report of five and one from F6FTC in Lyons on 15m. On our recent 80m net he received reports of 10dB over nine or better, from Brisbane, Adelaide and Canberra. Participating stations being VK4XY, VK5GZ, VK1KT and VK1GD.

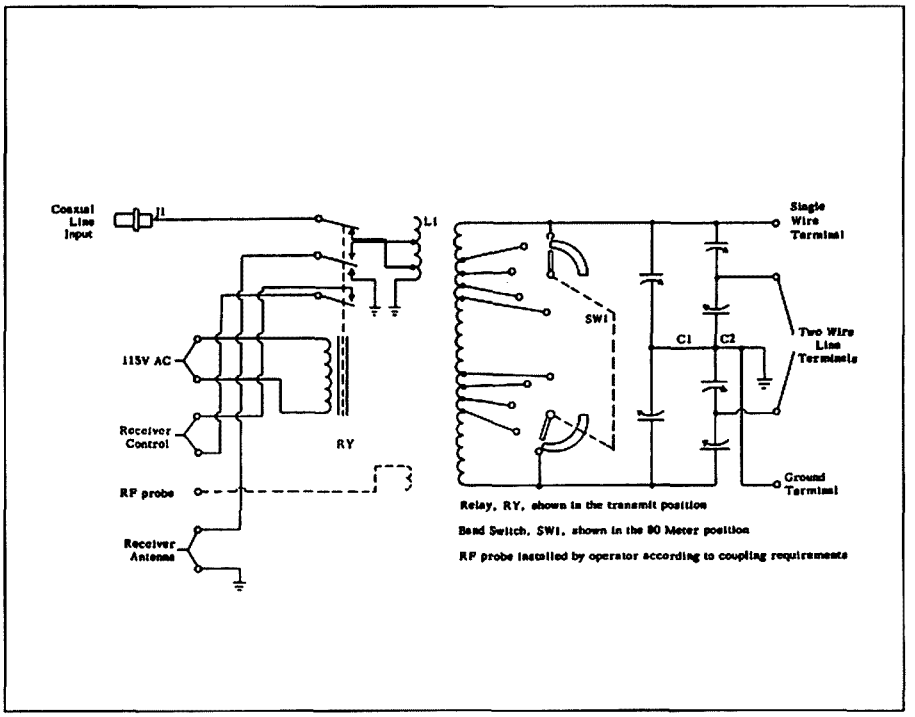
Jack tells me that at least two other stations are using this organic radiator: VK2AAE with a 45ft tall apple gum, and VK2ASR with a 70ft spotted gum.

It was suggested an iron bark might make a better radiator, but I am sure the copper beech would have a lower resistance! In this respect it is worth considering the possible resistance that may be encountered. For example, a common antenna may use 16SWG wire, approximately 1/16" or 1.6mm in diameter. Now, by virtue of the difference in cross-sectional area, a tree branch only one inch in diameter to have the same small resistance per unit length could have a coefficient of 256 relative to copper (or a ratio of 50K [49.600] for a tree one foot in diameter). The multiplicity of branches of different lengths could be either considered as individual radiating elements of 1/4 wavelengths or the whole tree approximating to a discone radiator of wide bandwidth, tuned against ground.

There is obviously considerable scope for experimentation, and if you are not keen on driving nails into your green friend which you have nurtured for a lifetime, try capacitive coupling through aluminium foil wrapped around the trunk. In addition to the chemical composition of the sap, and whether it flows up the centre, or just under the bark, ground moisture and atmospheric conditions will obviously contribute to the overall efficiency (and impedance matching required) and, of course, may vary from day to day.

Although for most hams this may be merely an interesting and entertaining experiment, for those who are not permitted to erect structures due to various constraints, it may be the difference between getting on air or just listening. If you don't happen to have a 71-inch camellia, never mind, try a cabbage and a lot of fertiliser!

Jack and I would be very interested to hear of anyone who was involved in the original use of trees in this mode, or any current experiments.



Circuit diagram of the 275W matchbox.

I might just try this out for the next John Moyle Field Day contest.

Tuning around 80 metres the other night, I heard a couple of amateurs discussing the possibility of using twin lamp flex (known as figure eight) as a feeder for an antenna. Well I won't go into the pros and cons of its suitability, but here are all the details you might need if you want to give it a go. All of these figures were derived at a frequency of 45MHz, and depend on the colour of the plastic covering. I am not sure if all the colours listed are still available.

	RF loss in dB for 100ft	Impedance	Velocity factor.
Blue	2.08	157.5 ohms	
Yellow	3.38	161 ohms	.658
Black	2.48	165 ohms	.69
Brown	3.38	155 ohms	.71
White	3.02	152 ohms	.696
Red	2.82	157 ohms	.76
Clear	3.73	146 ohms	.7

So there you are. If you have some why not give it a try. You will of course need to do a bit of matching, probably at both ends of the feeder. Let us know if you have any ideas on its use.

And that's for this month so it's goodbye from him and goodbye from me.

THE TWO RONS

ar

WOMEN IN RADIO

DOROTHY BISHOP VK2DDB
153A GALSTON RD
HORNSBY HEIGHTS
AND
CHRISTINE TAYLOR VK5CTY
16 FAIRMONT AV
BLACK FOREST 5035

IN THE EARLY DAYS of amateur radio the "little woman" seldom ventured into the hallowed domain of the radio shack unless she was the bearer of refreshments, or wished to assure herself that the occupant was still in the land of the living.

If she made it safely to the workbench she would be told: "Look dear, you wouldn't understand. Be careful of this! Watch out for that! By the way, dear, what's for dinner tonight?" So she would retire meekly to her housewifely duties once again.

It is no longer like that in every amateur household, as a poem by Joy VK2EBX says:

I LIKE AMATEUR RADIO

I like amateur radio, I really think it's fine
That I'll still be a "YL", if I live to ninety-nine.

I like amateur radio and getting on the air,
Making friends around the world and contacts everywhere.

You can talk to Lapps in Lapland, Nepalese in Kathmandu,
Malays in Kuala Lumpur, or Peruvians in Peru.

You can talk to dukes and dustmen, or communicate in Morse,
Experiment with ATV and RTTY of course.

Put together bits and pieces, though at first the prospect balks,
A diode here a condenser there, and — listen to that — it talks.

Experiment with aerials, it looks real good on paper,
But getting that lot in the air is quite another caper.

You can enter in a contest, gather points for an award,
Join a DX net, or "ragchew"; one thing's sure, you're never bored.

Yes I like amateur radio, and all the friendly sounds,
Removed from all the trouble and strife with which this world abounds.

It's a satisfying hobby, it will certainly do me,
'Til they write beside my name the words "Became a silent key".

Austine VK3YL

The first Australian lady to obtain her amateur licence was Florence McKenzie whose name is commemorated by the trophy awarded (most years) to a YL Novice Morse operator in the ALARA Contest.

It is a Morse competition, because this mode was that used by Florence McKenzie)who held the calls OA2GA, VK2FV and VK2GR at different times from 1926 until her death in 1982.

Mrs McKenzie held a degree in electrical engineering, ran an electrical shop in Sydney and was one of the founders of *Wireless World* which later became *Electronics Australia*. She also taught Morse Code to 50 girls in 1939 who, with her, went on to teach both men and women the code, in the Navy and the Air Force. Many of these girls became foundation members of the WRENs and the WAAFs.

Two other early lady amateurs were Elizabeth VK3HM and Austine VK3YL. Elizabeth took up the hobby after helping her son Allen VK3HL to get his licence. She has the reputation of having exchanged greetings with at least one station on each continent on Christmas Eve 1929 - thereby, in one day, qualifying for her Worked All Continents Award!

Austine's interest started when, as a child, she was given a crystal set which she immediately pulled apart — to find out how it worked! She was the first woman admitted to the RAAF Radio Reserve and can still be heard keeping skeds and Morsing around on the bands.

Queensland had some early amateurs, too, with Dorothy VK4DH who passed her exam in November 1929 and obtained her licence in February 1930 (thank goodness we don't have to wait that long these days!). There was Ida VK4JH in 1933 and Madeline VK4YL who, at 12 years old, was the youngest amateur in the British Empire.

Betty VK5YL was the firstSA YL, but a Miss Rogers, in 1919, had applied to join that Division to be told, "At present, this Institute is unable to admit lady members." The current holder of VK5YL Denise is one of the YLs featured on the front cover of this issue. She has held an amateur licence for over 35 years.

In WA and Tasmania, the first lady amateurs took the YL suffix too. I wonder why?

They were Ruth VK6YL and Joy VK7YL. Ruth obtained her licence before WW2 but, like all the other amateurs, she had to close down her station when the war came. She joined the RAAF and was on watch when Darwin was bombed, so she was one of the first people to know about the bombing.

Joy VK7YL joined a class to study for

her licence as the only girl with 15 boys. She not only passed that exam but also completed her final year at Teacher's College at the same time. She built her own receiver and transmitter, and with the assistance of her family — and the instructor from the Radio Class — erected her own mast.

She and Jack VK7JB, that instructor, subsequently married in the 1940s.

ALARA - THE BEGINNING
by Joy VK2EBX

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 wives 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 ALARA grew and grew!
Now things are very different, as all will soon agree,
And the YL role has changed a lot since ALARA came to be;
So while YLs work the radio at all the social "do's"
The OMs are baby-sitting while they tend the barbecues.

ALARA — A Brief History

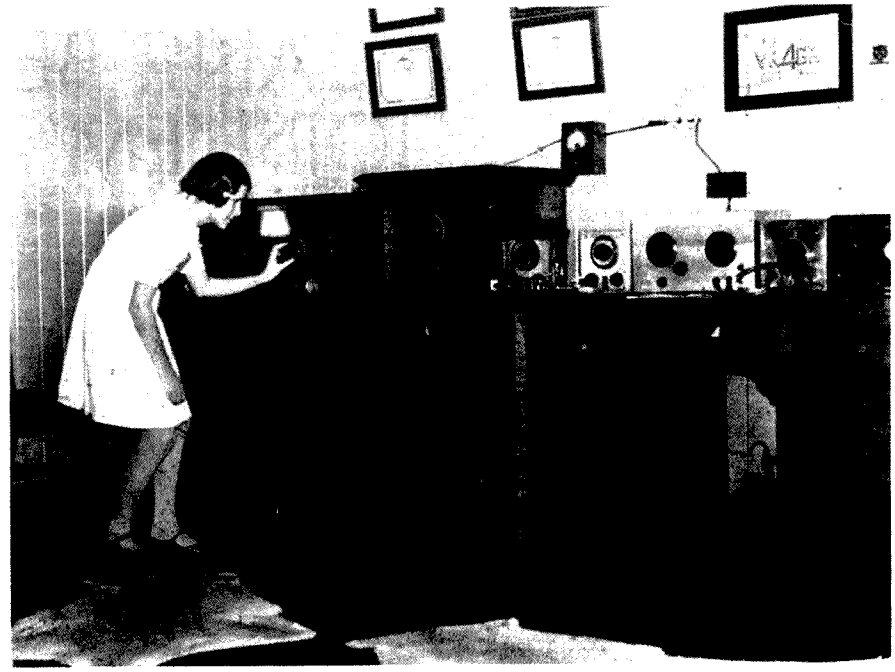
The idea for an organization of lady amateurs and other interested YLs was conceived in 1975 by Norma VK3AYL who had often found herself the odd one out at radio gatherings. When she talked to other women she found they shared this experience, so they formed their own group. It started out as LARA on 26 July 1975 with about 20 members who elected Norma their President. The name was changed to ALARA in 1978 and currently has 230 financial members.

Over the years mention of the group has appeared in many local and national newspapers and magazines, and members have been interviewed on radio and television.

The 1983 article in *New Idea* featuring Mavis VK3KS, Kim VK3CYL and Margaret VK3DML resulted in 40 letters to the then secretary Jenny VK5ANW, who later became President of the VK5 Division in 1986, following in the steps of Susan VK2BSB who was made President of the VK2 Division in 1982. Another member, Christine VK6ZLZ, became President of the VK6 Division in 1988.

ALARA — Today

As well as being represented at many gatherings of "hams", ALARA members hold their own triennial ALARAMEET, to which YLs and their OMs come from all over Australia and from New Zealand. The first of these was in Mildura in 1984, then Adelaide 1987 and Dubbo 1990. The next one in 1993 will be in Castlemaine.



Madeline VK4YL at the controls of VK4GK/YL

Recently Dorothy VK2DDB has been publicising ALARA with a series of talks to some of the VK2 Clubs. Dorothy is the VK2 ALARA representative.

She compiled most of the material in this article, some of it from material supplied by one of the older amateurs. If anyone has any relevant information we would appreciate hearing from them.

Each State has a State Rep; and if any Radio Club would like a speaker from ALARA, the WIA Divisions have contact information.

The State Reps can also help any interested lady who would like to either become an amateur herself or just join ALARA.

ALARA has an attractive Award for contacting a number of ALARA members, the details of which are published regularly. This is open to all amateurs and SWLs.

ALARA runs the ALARA Contest each November, details of which were published in the October issue. Both YLs and OMs are welcome to participate with certificates issued for the top scorers in a number of categories.

There is also a sponsorship scheme whereby overseas YLs can become members of ALARA, often sponsoring the Australian YL into their own group. So, in Australia we have members of BYLARA (UK), CLARA (Canada), YLRL (USA), WARO (New Zealand), and JARL (Japan). Many of these organisations have Contests and Conventions and Awards in which some VK members have participated.

These days there are many more parts for a woman to play in radio than ever before, if she wants to be more than a provider of refreshments. ar

The WIA regrets that the wrong Goodhand advertisement went in the October 1991 issue of Amateur Radio.

"IF YOU CAN'T BEAT 'EM JOIN 'EM"

CHRISTINE RUSSELL VK3LCR
21 CLENDON RD, FERNTREE GULLY 3156

WELL, I FINALLY DECIDED to take the plunge! Study for (and get!!) my Novice Licence. The first step on the road to an unrestricted licence, which will give me the freedom to talk to anyone on the air, anywhere in the world. I had always wanted to do this, but had never got around to it.

I decided this before Christmas last year so I was looking forward to the Novice Classes all the holidays.

The first couple of weeks of the course seemed fairly easy to understand Electron Theory. I thought "I can cope with this, no problems!" Then we had a small revision test. I didn't pass. Ouch! So much for being confident. I headed for the study notes.

Then came the subject of Resistors and Ohm's Law and, unfortunately, maths came along with it. I consider myself to be reasonably intelligent after having a reasonable high school education (a few years ago now), so when I was faced with the formulas I got a shock when I did not breeze through as easily as I had thought.

Do not get the wrong idea! This course was not hard, but I found it a bit difficult coming back to study after more than 10 years. I came to the conclusion that I had to apply myself to doing more than just an hour of study before I left for the weekly class.

We are talking serious study here!! At least two to three hours a week. Where was I going to find the time with three young children, a husband, and a part time job? Well, if you really want to achieve something you will find the time. Right? Right!

As I went along to the course, week after week, I came across names and

Chris VK3LCR pictured with OM Dale (not yet converted to amateur radio).

phrases I had never heard of before. And I seemed to be the only one in the class who hadn't.

"What's a multi-meter?" I asked. "The multi-meter is used for measuring voltages" was the reply. "Ah," I nodded, none the wiser.

We were using schematic diagrams and I could not work out how you could measure the voltage. I had lots of questions, but was reluctant to ask many of them as I did not want to show my total ignorance.

Fortunately, as I went along, I discovered a couple of easy ways to remember formulas. xL = 2πFL transposed into xL = "Two pies For Lunch", and the Ohms Law triangle transposed into E for Eagle which is over the I for Indian + the R for Rabbit. Therefore I = E/R etc. Not very technical, but at least easy to remember.

Halfway through the six-month theory course I was encouraged to sit for the Regulations exam, rather than sit all the exams at the same time. I passed! Wow! One down, three to go!

When we came to capacitors I had great trouble trying to work out how you picked this thing up. Once again we were learning this using schematic diagrams and, for the life of me I could not understand how you picked up two metal plates with air in between them. But when I actually saw a real capacitor, "Of course, I always knew it looked like that!"

By now the lecturer was giving me some strange looks, obviously thinking I have lived a very sheltered life, but I pressed on. Lots more study required.

AC Theory — "Excuse me," I said apologetically, "Could you run through that one more time please?" (the third time by now!). This was the hardest lesson to understand so far. By now my brain was in panic mode. The more the lecturer said, the less I took in and the more I panicked. How was I ever going to get my licence? And I thought I could pass Morse at the same time!!

This was the fork in the road! I had come so far and, apart from a couple of hiccups, I had thought I was doing fine. But AC Theory!!

A couple of days after that class I calmed down, and decided that I still really wanted to go for this amateur radio licence and resolved yet again that I was going to have to do even more study. I also decided to keep studying the same subject until I understood it, even if it meant I was a couple of weeks behind in class. Now this may or may not be a good idea, but it kept me going.

By now of course I realised that some of the others in the class were not breezing through this easily either. But so what! I kept telling myself "No-one told me it was going to be easy. Nothing really worth achieving is ever 'easy'." I just was not used to study, and neither were some of the others.

I was much braver now, and as soon as the lecturer mentioned in passing a term I had not heard before I quickly enquired as to what he was actually talking about. It's amazing how many words can mean the same thing! What is linear? What is oscillation? These terms were being used in passing and I had to understand what they meant or I would be behind.

I work in the Federal Executive office of the WIA, and fortunately Brenda Edmonds VK3KT, Graham Thornton VK3IY and Bill Roper VK3ARZ were on hand, expertly and patiently to explain the dark mysteries of amateur radio theory to me when my brain started to fog up. At least the Block Diagrams were easy to understand.

One never-to-be-forgotten evening, not knowing what it stood for, I asked "How do you spell CROW?" EVERYONE in the room turned to me and said CRO! I just grinned. They were used to me by now. The instructor asked generally, while looking at me, "I assume everyone has seen a Cathode Ray Oscilloscope?" Everyone nodded, while I shook my head! He shook his head disbelieving yet, by now, prepared to believe anything about me.

Next we did Receivers and Microphones. Suddenly something clicked. I understood what we were talking about. All the hard slog was paying off. "See, I told you the rest was easy," we were told by the instructor. I now enjoyed learning about amateur radio more because the light was dawning faster than it had before.

One night we saw some videos explaining about the common emitter, common base, and common collector. Now if only I could get a hold of these and replay and replay, that would save a lot of reading!!

The countdown was on. Only four weeks left until the exams. Twenty-seven optimists started the course and now only 10 were left — would I be next to go? No way! !

I had now decided to go for broke — plunge in at the deep end and learn Morse too. I was too impatient to wait until the next exams were held before receiving my licence. Now I was listening to Morse tapes for about half an hour each night, while peeling the potatoes and doing the dishes. My husband was not overly thrilled about this. To be quite frank, it drove him nuts, and he left the room whenever I played the tapes. Consequently, to preserve family harmony, I continued my studies in the sewing room.

I had now virtually stopped watching TV, with less than two weeks left before "E" day. Fortunately our last class session was on Revision. I was desperately hoping for some last-minute tips. whew! A two-day tutorial in two and a half hours, my brain was spinning. It's now or never — I was doing two hours study a day, including Morse.

The last weekend before the exam, I went to my father for some help at my first attempt at Morse sending, and some receiving practice on the computer. "Flick your wrist," I was told. "Use your wrist". Try, try and try again. It seemed hopeless.

I spent some time receiving what I thought was 5wpm Morse. But I was making the allowable 10 mistakes and I was worried. Dad said he would reduce the speed on the computer so I could keep up. I protested that I had to be able to do 5wpm to pass! He grinned "You have been doing nearly 7wpm!" He had tricked me but my hopes had risen again — maybe I was in with a chance after all.

Well, exams night arrived! Boy, was I nervous, and I was not the only one, either. The room had quite a few shaky hands in it before the Morse exams started. I was first in for sending, and glad to get it over with. I was fairly confident with my theory knowledge, but there could always be questions on some things which I had overlooked.

Two weeks later the long-awaited letter from the WIA Victorian Division arrived. I PASSED!!! The euphoria and elation were unreal. I was on a high with incredible feelings of success and achievement. Wow!!I did It!!

Piece of cake really!! I kidded myself.

I am now the proud holder of callsign VK3LCR. *(Easily remembered as "Lovely Chris Russell" — Ed).* I also discovered that after more than 10 years away from books, I was in danger of becoming hooked on study.

Look out AOCP! Here I come!

ar

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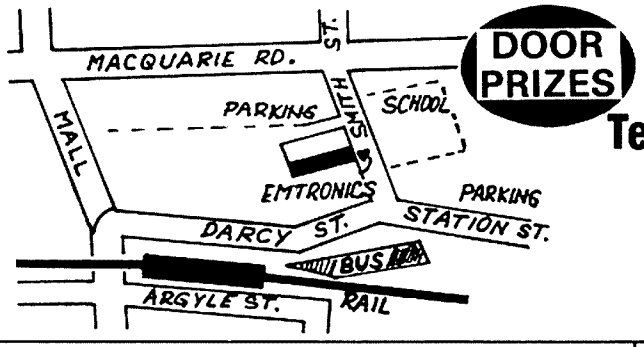

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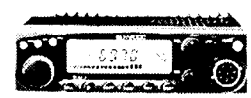

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Icom IC-229H	$775	$715
Icom IC-275H	$1920	$1750
Icom IC-W2A	$873	$785
Icom IC-3220H	$1159	$1039
Icom IC-R1	$725	$650
Icom IC-R100	$986	$899
Icom IC-R7100	$2125	$1950
Icom IC-R72	$1369	$1275
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JST-135

HF Transceiver

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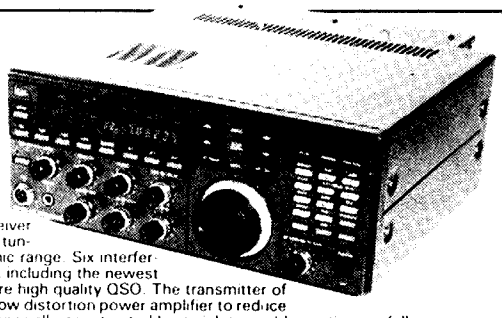

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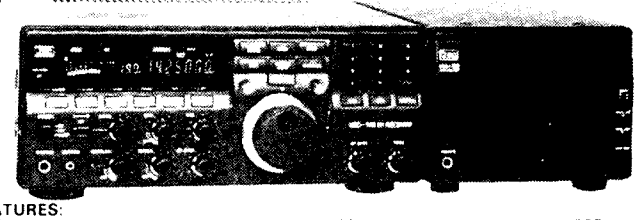

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AWARDS

JOHN KELLEHER VK3DP – FEDERAL AWARDS MANAGER

The DXCC and You

A letter to my predecessor from Stephen Pall VK2PS has triggered off a few thoughts on this topic.

In his letter, Stephen points out that when DXCC is mentioned, operators straight away think of the ARRL award, but he feels the WIA DXCC deserves a higher profile and some distinction.

I personally think the WIA DXCC already holds some distinction, and am proud to say I hold certificate No 231, which satisfies my own requirements admirably.

As a member of the WIA, the certificate was issued free of charge, in itself a boon to VK DX operators.

It saves the necessity of parcelling up 100 plus QSL cards, and paying return postage, and the ARRL fees for the award, and the long, long wait involved.

Some may disagree, but I think the two awards (WIA and ARRL) are on a par for distinction.

As for QSL card verifications, we enjoy the scrutiny of not only myself, but my assistant and the DXCC co-ordinator, Steve VK3OT. I can personally verify that if an application does not reach the standard required, the applicant is notified of any shortcomings, and the application held in abeyance until any corrections are made and the required standard reached.

So you can see that all the necessary protocols are observed to make ours as good as theirs, and fully appropriate to the amount of work, expertise and long hours necessary to obtain this prestigious award. So, if you qualify for DXCC, don't hesitate to apply to the WIA for yours.

CQ Magazine Awards

I have had numerous enquiries regarding these awards. To satisfy those who need the WAZ and others covered by *CQ* magazine, Bill Vogel VK5NVW is an authorised checkpoint for these awards. He can supply rules, application forms and check cards.

So, to save the necessity of sending your valuable cards overseas and incurring, for some, an unnecessary expense, send your award information to: Bill Vogel, 16 Wandilla St, Largs North 5016, accompanied by adequate return postage.

Swedish Radio Society (SSA) Official Diploma Program

Worked All Sweden Award — WASA
Heard all Sweden Award — HASA
Swedish Locator Award — SLA
Field Award

Note: The WASM and WASM II diplomas are hereby cancelled.

For each award a record books is available (rules, record sheets, application form, index, maps etc).

1. Worked all Sweden Award — WASA

WASA will be issued to licensed radio amateurs for verified contacts with Swedish counties (län) and callsign districts made after 1 January 1988.

Swedish applicants shall be members of SSA, and overseas applicants shall be members of their own country's IARU affiliated radio society.

All contacts shall have been made from the same QTH and/or within a radius of 150km from that QTH.

Each individual contact shall be made with the same band and mode.

The same station may be contacted on several different bands.

All contacts shall be made with land-based stations.

Contact with earth-based repeaters is not permitted.

Separate diplomas will be issued for HF, 144MHz, 432MHz, 1296MHz and satellites.

For HF — 1.8, 3.5, 7, 10, 14, 18, 21, 24 and 28MHz are counted as separate bands.

Within every group, separate diplomas can also be issued for the different classes.

Stickers can be gained for 2xCW, 2xPhone, 2xSSB and 2xRTTY.

All contacts shall be verified with QSL cards or equivalent, on which there is sufficient information to accurately determine the län/callsign district worked.

Applications shall consist of QSL cards, and a list of these with the län/callsign districts in alphabetical/numerical order.

Instead of sending in QSL cards, overseas applicants may get their cards checked by the diploma managers in their own countries, if such a person exists (GCR-list).

The fee for the diploma is SEK 30, ASD 5, USD 5, DM 10 or 10 IRC.

Applications should be addressed to: WASA Diploma Manager, SSA, Östmarksgatan 43, S-123 42 Farsta, Sweden.

Requirements: WASA-HF

	Applicants in Europe
Class 3	All callsign districts (0,1,2,3,4,5,6,7)
Class 2	All läns
Class 1	All läns on 2 bands
Shield	All läns on 5 bands
	Applicants outside Europe
Class 3	All läns on 2 bands
Class 2	All läns on 3 bands
Class 1	All läns on 4 bands
Shield	All läns on 5 bands

WASA — 144MHz	
Class 2	All callsign districts
Class 1	All läns
Shield	5 different stations in each län
WASA — 432MHz	
Class 2	All callsign districts
Class 1	All läns
Shield	3 different stations in each län
WASA — 1296MHz	
Class 1	All callsign districts
Shield	All läns
WASA — Satellite	
Class 2	All callsign districts
Class 1	All läns
Shield	All läns in 2 modes each

2. Heard all Sweden Award — HASA

HASA will be issued by SSA to all shortwave listeners (SWLs) for verified reports of stations in Swedish läns and callsign districts for contacts made as from 1 January 1988. The diploma is issued in classes and groups corresponding to the rules for the Worked all Sweden Award (WASA). No shields will, however, be issued.

3. Swedish Locator Award — SLA

The SLA is issued by SSA to licensed radio amateurs for verified contacts made with the various locator squares in Sweden, as defined by the Maidenhead system, for contacts made as from 1 January 1988.

The diploma is also issued to SWLs on the equivalent basis.

Swedish applicants shall be members of SSA, and overseas applicants shall be members of their own country's IARU affiliated radio society.

Contacts with earth-based repeaters are not permitted.

All permitted amateur radio bands may be used.

Requirements:

Basic diploma	25 squares
Sticker	35 squares
Sticker	45 squares
Sticker	55 squares
Sticker	60 squares
Sticker	All squares (64)

Endorsements can be obtained for individual bands and modes.

QSL cards shall have been received but do not need to be sent in. Applications shall be made by means of a GCR list, verified by the applicant's national award manager.

The fee for the basic diploma is SEK 30, USD 5 or 10 IRC and SEK5, USD 1, two IRC for each separate sticker application.

Applications should be sent to: SLA Diploma Manager, SSA, Östmarksgatan 43, S-123 42 Farsta, Sweden.

Field Award

The SSA will issue the Field Award to licensed radio amateurs and shortwave listeners for verified contacts with fields, as defined by the locator system adopted as from 1 January 1985 (Maidenhead Locator). Contacts on or later than this date are valid for the award. The Field Award is issued in six different classes:

Bronze	basic	100 fields
Silver	sticker	150 fields
Gold	sticker	200 fields
Platinum	sticker	250 fields
Shield		300 fields
Shield, gold plate		324 fields

All amateur radio bands and modes are permitted. Endorsements will not be issued.

All contacts shall be made with stations on the surface of the earth.

Contacts shall be verified by QSL cards or equivalent, on which the field or position is clearly stated with such accuracy that the field can be determined. The term "position" refers to latitude and longitude or to a place name.

If there is any uncertainty about a field, SSA may demand further information before approving the contact. If the uncertainty remains, then the contact will not be approved.

A random sample of individual QSL cards will be made, which must be sent in for checking.

The application shall be made on a GCR list containing the information from each QSL card which is required for approval. The GCR list shall be verified by the applicant's national awards manager or other official in the applicant's national amateur radio society.

The fee is SEK 30, USD 4 of 10 IRC for each class.

Manager, SSA, Ostmarksgatan 43, S-123 42 Farsta, Sweden.

Panama International Award

by the Panamanian Amateur Radio League. The award is available to all licensed radio amateurs following the rules.

1. The award will be issued to amateurs who received QSL cards from HP stations, at least one from each of the nine different call areas (1,2,3,4,5,6,7,8 and 9) on any band and mode.
2. Up to three call areas may be substituted with any of the official club stations for ex HP1LR to HP9LR.
3. Valid contacts after 1 January 1978.
4. Applicants must send a copy of the log or list of the stations worked to: LPRA-HP Bureau, PO Box 175, Panama 9A.
5. If you are not a member of the radio club, you will have to send the QSL cards, which will be returned.
6. The fee for the Panama International award is $US3.00 in the form of an international money order or equivalent in IRCs (IRC = 0.50) to be sent to "Liga Panameña de Radioaficionados Nacional". ar

WIA Awards Program

General Rules

Cost: Free to all WIA members, VK non-members pay $A5.00 and others $US5.00 or eight IRCs.

Verifications: Applicants need to hold QSL cards for QSOs claimed; however, do not send QSL cards with your application A list of all contacts is needed, which should list the following information: Date, time, callsign of station contacted, frequency, mode. Contacts should be listed in order of callsigns. At the bottom of this list should be a declaration signed by an official of a recognised society or by two licensed amateurs, reading as follows"I/ we certify that (insert name and callsign of applicant) holds QSL cards corresponding to the above list and that I/we have personally inspected these cards." Signatories to the declaration should clearly indicate their names and callsigns.

Applications

Applicants should state whether they are WIA members and, if so, list their membership number. Where relevant, changes in callsign and dates of such changes should be indicated.

All contacts for any particular award should be made from the same call area.

Crossband contacts are not eligible, nor are those made through terrestrial repeaters from aircraft or to or from sea-going vessels.

Where a fee is payable this should be sent with the application.

In cases of dispute the decision of the Federal Awards Manager and two officers of the Federal Executive on the interpretation of these rules shall be final and binding.

Applications should be sent to: Federal Awards Manager, Wireless Institute of Australia, c/- PO Box 300, South Caulfield, Victoria 3162, Australia.

Awards Available

WIA DXCC Award: This award is available to all amateurs who submit evidence of having worked 100 countries, and can be endorsed for various bands and modes. Acceptable countries are those that are acceptable for ARRL DXCC (I will print an up-to-date country list soon), with the WIA reserving the right to make different decisions in regard to additions and deletions.

Having obtained the DXCC award, holders may register subsequent claims for higher totals, and these will be published from time to time in *Amateur Radio* magazine in the form of a ladder. No stickers to indicate these higher levels on certificates are available (I'm working on this one). Applications for higher totals should be made in multiples of 25 up to a total of 200 (ie 125, 150, 175, 200) and thereafter in multiples of 10 up to a total of 300. After 300, applications will be processed in one country steps or as required.

Should a country be deleted from the DXCC list, credit for that country will be allowed if worked before the date of deletion. The DXCC ladder will show the member's tally of current countries and total of current plus deleted countries, eg 200/220 — meaning 200 current countries and an extra 20 that have been deleted at some time, but were worked before the date of deletion.

All claimed QSOs must be made from the same DXCC country.

General rules apply.

Worked All VK Call Areas: Known as "WAVKCA" this colourful (now A4 sized) certificate is the WIA's most popular award. There are separate requirements for local and overseas amateurs.

VK Applicants require 77 QSOs as follows: VK0 — three contacts from at least two different areas; VK1 — three contacts on at least two different bands; VK2, 3, 4, 5, 6 and 7 — 10 contacts from each call area on at least three different bands; VK8 — three contacts on at least two different bands; VK9 — four contacts from at least three different areas.

General rules apply except Australian applicants need not hold QSL cards. No repeat contacts made after 14 February, 1990 will count.

DX Applicants (non VK) require 22 QSOs as follows: VK0, 1 — one contact from each call area; VK2, 3, 4, 5, 6 and 7 — three contacts from each call area; VK8, 9 — one contact from each call area.

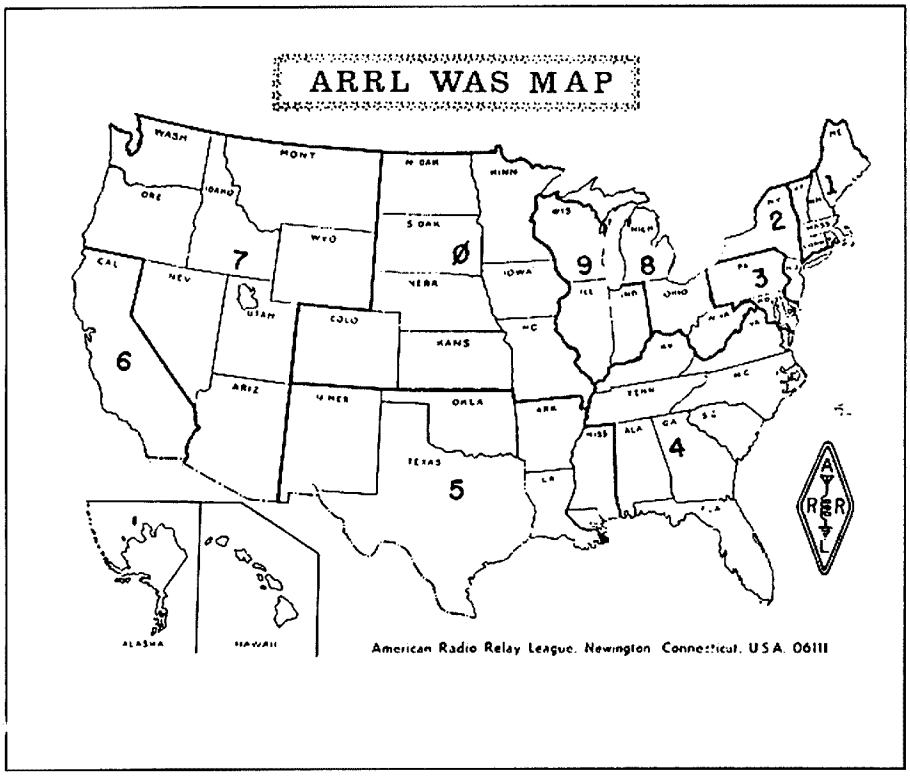
Contacts must be after 1 January 1946. General rules apply.

Heard All VK Call Areas: This is a "heard only" version of WAVKCA award, available to SWLs on the same basis as to amateurs; the same fees and procedures apply. General rules apply.

Worked all VK Areas (VHF) Award: Requires 22 QSOs on VHF bands (50MHz and above as follows: VK0, 1 — one contact each; VK2, 3, 4, 5, 6 and 7 — three contacts from each; VK8,9 — one contact each.

Contacts must have been made after 1 January 1958. If the applicant moves to a new location and the new location exceeds a distance of 240km from the old, a new application will be necessary for the new QTH. General rules apply.

Worked all States (VHF) Award: Requires eight QSOs on VHF bands (50MHz and above) as follows: One contact each with each State and Territory of Australia as listed: VK1 — Australian Capital Territory; VK2 — New South Wales; VK3 — Victoria; VK4 — Queensland; VK5 — South Australia; VK6 —



Western Australia; VK7 — Tasmania; VK8 — Northern Territory.

General rules apply.

Australian VHF Century Club Award: Requires 100 QSOs on VHF bands (50MHz and above) as follows: 100 contacts with 100 different stations, at least 70 of which must be Australian. Separate awards will be issued for each different VHF/UHF band. Contacts must be on or after 1 June 1948. If the applicant moves to a new location and the new location exceeds of a distance of 240km from the old, a new application will be necessary for the new QTH.

General rules apply.

WIA Antarctic Award: Applicants need to make 10 confirmed contacts with amateur stations conducting valid operations from Antarctica. The 10 must include stations licensed by at least six different government authorities, and at least one must be a VK0.

Antarctica is defined as the land mass, including islands and permanent ice shelf below 60 degrees south latitude. (This excludes Heard and Macquarie Islands. These are sub-antarctic.

Contacts only on or after 23 February 1988 are valid for this award.

General rules apply.

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CONTESTS

(INFORMATION PROVIDED BY RELEVANT CONTEST MANAGERS)

Contest Calendar

November

8-10	Japan International DX Contest
9-10	European DX Contest RTTY
23-24	CQ WW DX CW Contest

December

7-8	ARRL 160m CW Contest
14-15	ARRL 10m CW and Phone Contest
21-Jan 18	Ross Hull (subject to confirmation)

February

7-8	Commonwealth Contest

March

21-22	John Moyle FD Contest (subject to confirmation)

JT-80 Anniversary Contest

00.00Z Saturday to 00.00Z Sunday 21-22 December 1991.

This contest is organised by the Mongolian Radio Sports Federation on the occasion of the 80th anniversary of the National Liberation Movement of Mongols.

Classes: Amateurs should participate in only one mode (CW or phone). A. Single operator multi bands. B. Multi operator multi bands single TX. C. SWLs.

Exchange: For JT, RST plus last two digits of year first licensed. For foreign, RST plus a three-figure QSO number starting with 001.

Scoring: Five points for contact with a Mongolian station. Three points for contact with other continent. One point for contact with own continent.

Multiplier: DXCC countries plus each JT station on each band.

Bands: 1.8-28MHz (not WARC).

Final Score: Total QSO points from all bands times the sum of the multipliers from each band.

Awards: Gold, silver, bronze trophies to the first three places of each class. Amateurs making more than 80 contacts will receive awards.

Submit separate logs for each band, including a summary sheet showing the scoring, transmitter power and other essential information. The usual signed declaration is also requested.

Logs must be received no later than two months after the end of the contest by: JT-80 Contest Commission, PO Box 639, Ulaanbaatar-13, Mongolia, Asia.

1991 Australasian Sprint Results

Entries for the sixth series of Australasian Sprints totalled 14 in the CW section (up by one from 1990) and 25 in the Phone Section (down by eight). Of these, four and 10 respectively had entered last year's contests, indicating significant changes in entrants — some very familiar callsigns were missing. It is interesting that there were approximately 38 operators in the CW Section and 100 in the Phone Section who participated in the contests but did not submit logs. I wonder why? Some of these appeared to have had quite good scores and may well have qualified for awards.

The scores in both sections were appreciably higher than those of last year due to the mostly good conditions on the two nights and to the relatively high number of operators on air. Comments received, especially those from first-time entrants, suggest that a good time was had by all and that the format of the contests is appreciated.

The Adelaide Hills Amateur Radio Society and the South Australian Division of the WIA congratulate the overall winner and also the

winners in the individual call areas. Winner? Yes, that man has done it again. Another great effort by Roger Crofts VK4YB to record the highest score in both sections, as he did in 1990.

There were several highlights in this year's contests, not least of which was the entry of Lloyd VK2VZB in the CW section. This is, I believe, the first instance of such an entry by a Novice in the six years the Sprints have been run and hopefully it will lead to more next year — well done, Lloyd.

Conrad Romberg VK5CR, visiting Adelaide from his home in Dallas, Texas (home call sign N5CR) brought an FT107 and trap vertical antenna with him and, despite operating under some difficulties from his hotel, managed to make the highest score by a VK5 operator in the CW section.

Laurie Jenkinson VK3NTV, XYL of Steve VK3YH who is a previous outright winner and state winner in the Phone section, managed to grab the microphone first this year and won the certificate for highest scoring VK3 operator to add to their collection — should be quite a "contest" next year.

The hard luck story is that of Jo Dudley VK4JO who, until one day before the cut-off date for entries, had the leading score in the Phone section. Jo, who was equal runner up in 1990, was beaten this year by just one point.

Lists of the logs submitted together with the points claimed (or, in some cases, allowed) are shown below. Certificate winners are indicated by asterisks.

CW Sprint

ZL1GQ	*	19
VK2NV	*	23
VK2PS	*	22
VK2AIC		18
VK2VZB	*	10
VK3BU	*	23
VK3DG		18
VK4YB	**	37
VK4TT		21
VK4BIL		13
VK5CR	*	14
VK5MN/P		10
VK5AGX		8
VK7FN	*	22

Phone Sprint

ZL1BVK	*	57
ZL1GQ		48
VK1PJ	*	64
VK1FV		23
VK2AVI	*	36
VK2AIC		26
VK2CKW		21
VK3NTV	*	58
VK3CYL		53
VK3DD		25
VK4YB	**	70
VK4JO		69
VK5KCX	*	60
VK5KYM/P		55
VK5NOT/P		52
VK5AFO		51
VK5KAM		42
VK5RV		38
VK5CJP		32
VK5VC		31
VK5TY		30
VK5ZD		24
VK5OV		22
VK6LL	*	51
VK6BGF		24
VK-L40018	*	28

Some Operator Comments:

CW Sprint

ZL1GQ: Enjoyed the Sprint. Lots of VK signals for 40 minutes and then none — a quick change in conditions?

VK7FN: An enjoyable hour, plenty of ZLs up late.

VK2VZB: Congratulations to AHARS for running the Sprints. Suggest running perhaps four contests a year with some restricted to hand keys only. A little disappointed at the operating practices of a few operators.

VK4BIL: Good fun as usual and band conditions quite reasonable. The time for these short bursts is about right. I still find CW the most interesting and challenging.

VK3BKU: At the end of the hour felt sorry to stop as there were other stations yet to be worked. Short contests are a great way for new operators to gain experience. The period in which the Sprint coincided with the NZART Memorial Contest would have enlivened things for ZL operators.

Phone Sprint

VK2CKW: Enjoyed the action. Good fun.

VK3CYL: Entered for the first time and enjoyed the sprint very much. Hope to enter again next year and perhaps improve my score.

VK3NTV: Thanks for the contest, which was my first ever and was a great adrenalin boost.

VK4JO: As usual enjoyed the contest immensely.

VK6BGF: Not an outstanding tally, but at least an entry. Band conditions were not outstanding.

ZL1GQ: A really good show. The most and best VK signals on 80m for a long time. A very enjoyable hour's activity.

VK5KCX: Entered for first time and really enjoyed it. Could there be more one-hour sprints, perhaps on VHF/UHF?

VK5RV: A very enjoyable contest and the hour went quickly. Surprised at the good response from distant stations to my 15w.

VK5NOT: Operated portable from a national park with eight Watts and battery power. Thanks for the contest; looking forward to next year.

VK5KYM: Entered for the first time but not the last. Operated portable from the Coorong using emergency power. Very pleased with results — similar number of contacts to those obtained over 24 hours on multiple bands in John Moyle Field Day.

VK5AFO: Enjoyed the contest — short, sharp and shiny. Many more stations on this year. Worked more VK6s than usual.

VK5VC: First-ever contest and really enjoyed it. Looking forward to further contests in the future.

VK5ZD: Lots of activity this time. Let's hope that even half of them put in logs.

David Box VK5OV, Australasian Sprints Contest Manager, Adelaide Hills Amateur Radio Society.

1991 RD Contest Results

Neil Penfold VK6NE

VK3 Wins the RD Contest and Trophy

Congratulations to VK3 for its effort in this year's contest.

Despite poor band conditions, log comments gave a picture of a friendly contest with some good scores. The summary sheet only requirement was well received by operators (and my postman).

My thanks to all who participated, even if they didn't send in an entry.

Some checks have been done and it seems that about twice as many operators participated as sent in entries.

I acknowledge the work of the members of VK6ANC in compiling the scores and producing the results. Their work certainly eases the contest workload.

Comments have been included and paint a better picture than any write-up I could have done. See you all again next contest — VK6NE.

Results in numerical order

1st	VK3	1557.29
2nd	6	993.14
3rd	4	615.58
4th	2	570.94
5th	5	527.93
6th	1	297.86
7th	7	297.61
8th	8	17.29

Final score = $\frac{\text{No Logs}}{\text{No Licences}}$ x Total points x WF

Weighting Factor

VK1	33/412	x	3546	x	1.05	=	297.86
VK2	68/5323	x	6177	x	7.11	=	570.94
VK3	132/5204	x	15770	x	3.95	=	1557.29
VK4	70/3199	x	6710	x	4.17	=	615.58
VK5	72/2073	x	9669	x	1.56	=	527.93
VK6	105/1705	x	11524	x	1.39	=	993.14
VK7	34/651	x	2935	x	1.95	=	297.61
VK8	2/203	x	177	x	9.77	=	17.29

Comments from the RD Logs

After nearly 45 years of RD contesting, I believe the time is coming when the WIA should act to either shorten the operating period or end the contest altogether. Most of the participants these days were too young (if they were even born) to have any deep feeling towards the acts of dedication and sacrifice which this contest recalls. With the widespread use of equipment which does it all, leaving little for the operator to do, where is the stimulation to perpetuate the contest? Competing in state groups for a shield is an idea which may detract from the spirit of remembrance.

Further, 599, or five by nine, must be the bottom limit of unintelligent communication. If the ex-service members of the institute want a real contest, let them exchange service serial number, area of service, period of service etc in message form. It would then be a "remembrance" contest for those survivors who are still active. I think the commencing time of 08 hours should be retained. However, ending time should be either 20 hours UTC, or 2359 hours UTC. Eliminating daytime activity on Sunday after that time would make life easier in families whose interest cannot be very great anyway, and the elder citizens

would avoid the exhaustion natural to their age.

The scores indicate that few of the older generation operate for 24 hours. To them, participation evokes sentiment, to them it is the spirit, not competitiveness, but of remembrance, which motivates them. I therefore ask which is more ennobling, to win or remember with gratitude ... VK4XA.

Enjoyed the contest, though I wasn't as successful as I had hoped. Have you considered allowing other DX contacts beyond ZL and P29 surely on 20, 15 10 there is good interest in the RD and some change to allow wider participation might be a good move ... VK1ST.

Although my score is lower than last year, I enjoyed the friendly contest and will be back again next year ; VK2LEE.

I operated 80, 40, 20, 15, 10. There were virtually no stations on 15 or 10 at all, and the number of CW stations was way down on when I last went in the contest eight years or so ago ... VK4OR.

Summary sheet only sure saves a lot of effort! ... VK3ABP.

We made 624 entries in log, less dupes, of course. A larger fraction of these than in previous years was with ZL and P29. In addition, time-out was called to work some rare DX — Cambodia, Brazil and Mozambique springing to mind. A most notable contact was with ZL2NCC Jeremy, who is 14 years old and only just got his licence ... VK6SZ.

Trust this easier method of entry will ensure lots more participants sending in their scores, as it saves a lot of time rewriting for us old guys who are not computer oriented. Contest as enjoyable as ever, and don't think I've missed one yet since they started. Can't understand why novices who have a great opportunity in the RD contest do not operate more on 10m band, which was open to VK6 most of the day on Sunday and would have been kept busy. Fifteen metres was not so bad, as few novices did well on that band ... VK4LT.

Great contest again this year; good conditions on 80m Saturday night, along with the usual QRM! My wife VK3NTV and I operated the station in tandem most of Saturday night, our first contest together. It was great fun. I almost forgot, a great idea, summary sheet only; saved hours of redoing my untidy contest log. Thanks to all concerned with this move ... VK3YH.

It is a great pity that some operators fail to understand that more often than not band space becomes a premium and so more than likely sometimes two or more stations, and not necessarily from the same location, may be on one frequency, especially when on the novice segments of 80m ... VK2MUZ.

Very pleased to find such a "turn out" on most bands, thus maintaining that necessary interest throughout. DX stations running their own contest on 14MHz in particular helped to make listening very interesting!!! However, the standard of operating helped to make the challenge very enjoyable. Congratulations to all ... VK5AGX.

Not as many as last year. Same problem as the JM Contest. Are we getting disinterested in the hobby? I think the blame lies with the ease with which we can use 2m to chinwag. We may as well be at the pub. Still think you should allow logging of overseas stations; there were many times I had to ignore or not hear the overseas callers. It's not right. Had a great time as usual ... VK1PJ.

A good contest and pleasing to see participation of P29 and ZL. Unfortunately, my current location in Queensland apparently does not lend itself to scoring as well as my last one in the ACT, but I enjoyed the event immensely, and the climate is so much better here ... VK4DRC.

My first contest, and enjoyed it very much — learning a great deal about operating in general. Restrictions of power/bands of operation imposed by a combined licence are handicaps. I will try, and very hard, to eliminate before next year's contest. The VHF/UHF category was a farce in the Sydney metropolitan area. I made hundreds of calls on 2m and 70cm without any response at all. I also continuously ran scanners on both bands to monitor activity. I heard nothing! ... VK2JIM.

A most enjoyable contest — gave it more of a bash this year than last. There still seems to be fewer of the older callsigns around! Very friendly and good fun. It seems "naked" only sending the summary sheet and not the log as well, but should be a lot easier for you to check ... VK3DDX.

Congratulations on the rule changes; trust all works out okay. Have retired 13 years now and still doing a job for WIA ... VK4PJ.

Only on for a short time — not having to rewrite the log is a most appreciated convenience. Hopefully this will increase participation ... VK5ZKK.

I had a great time this year; thanks for your efforts ... VK2DOJ.

General good conditions and, judging by the number of stations heard, you will be inundated with logs! Regards and 73 ... VK6BGF.

This seems to be one of the friendliest, hassle-free RD contests I've had the pleasure of entering. Congratulations to all who made it worthwhile ... VK2IV.

My first time in the contest, and had a great time. "Hi". 73 ... D Lancaster.

As few as they may be, there are some operators who will falsely declare they operated in accordance with the "spirit of the contest"!?! I am a member of the RSL, 73 ... VK5KV.

My special thanks to VK6NE and helpers; my only disappointment was there were not enough VK6 operators on the air, and most kept to 146.5 and 146.55, causing hold-ups when we have many other recognised simplex frequencies. Also regret not being able to devote so much time to contest this year.

I object to rule 7. Club stations can have 24 operators during the contest. I worked my station 24 hours on my own. Club stations should compete against each other ... VK6ATZ.

The general operating standard and behaviour were excellent. It saddens me to observe fewer and fewer stations each year operate in the CW section ... VK4CAG.

I was able to join in the latter part of Sunday afternoon and found it a pleasant contest again — after not being available for a year or two ... ZL3TX.

Another enjoyable contest. I could only operate Saturday evening and one hour on Sunday; hope to do better next year. All the best ... VK5MN.

I won't bore you with a long screed this time, but I have to put in my annual appeal for the return of the open section ... VK6ED.

Herewith this year's entry. Not much, I'm afraid. I lost the LF antenna in the gale and couldn't work below 14MHz; but I guess every little helps ... VK6AJ.

The standard of operation by competing stations this year was an improvement over last year. The only criticism I do have concerned a couple of stations on VHF which at times were lax in using their full callsign but, after a little prompting, this was cured. A particular note from our station officer Keith Turner VK3CWT, who was quite surprised at the number of stations on VHF which wished each other all the best in their efforts this year and hoping to do it all again next year, nice to see.

This year was the first time this club was able to use a computer for logging in this contest and we certainly found it a lot easier than with pencil and paper. Our computer investment has paid dividends already. We were using Geoff Hudson VK3VR's program, and it worked very well indeed. When you release this year's results, may I suggest you encourage the development of programs for this contest, as I am sure there are some people out there who can come up with some good ideas. Computers, I feel, will return some vigour into this contest and encourage some younger operators. The rules for the contest would have to be made available a little earlier to allow time for writing these programs. I know from personal experience that we managed to get some younger operators only due to the computer ... VK3APC.

The number and variety of contacts were determined by the antenna and low power of my station. It was pleasing to see the increase of YL operators and the participation of Girl Guide and Scout groups, mainly from VK6. It was also interesting to discover enterprising "novices" on the novice band to appear in the shadow of full-call friends, with the full call alerting the opposite station to listen for a weaker novice call. (It was not a net operation) ... VK2PS.

A great way to celebrate my return to my native VK2 after 38 years in VK1. A most enjoyable contest, not without its humorous moments. The UA operator who would not be put off until he obtained his contest number (from me, and two before me). The VK who complained bitterly that I had stolen his frequency, explaining he had gone only temporarily for a coffee break and always intended coming back. The VK4 who confided he was giving out only a few numbers and mine was 59A?? Still, a lot of fun and congratulations to the organisers ... VK2ARJ (ex-VK1RJ, P29RJ, VK9RY).

Once again enjoyed the contest though there did not appear to be as many contesters around as in other years. Hope the decision not to submit logs doesn't lead to the lowering of the prestige of the RD, and a watering down of the particular significance of the day ... VK4RA.

Enjoyed taking part in the contest and I appreciate the time you spend in making this annual event enjoyable and worthwhile ... VK4CF.

What a great contest! Next year I'll be doing a much longer stint. It was great to hear so many VK stations on 20m all at one time — and all calling me. It was the best pile-up I've ever had. Thanks for your hard work ... VK6VZ.

VK1

	Points	Logs
HF Phone	2796	16
HF CW	77	3
VHF Phone	630	10
VHF CW	43	4
Totals	3546	33

VK1 HF Phone

VK1DX	398
VK1DI	395
VK1PJ	340
VK1EB	291
VK1ZX	214
VK1BR	213
VK1DF	172
VK1RH	161
VK1ST	133
VK1DW	105
VK1KLB	91
VK1DO	80
VK1CC	79
VK1PS	61
VK1DA	44
VK1CEE	19

HF CW

VK1CC	41
VK1DA	26
VK1DO	10

VHF Phone

VK1ZX	119
VK1DI	116
VK1DF	75
VK1RH	65
VK1DO	55
VK1DX	55
VK1PJ	53
VK1EB	45
VK1DW	37
VK1CEE	10

VHF CW

VK1DF	12
VK1RH	11
VK1DO	10
VK1DX	10

VK2

	Points	Logs
HF Phone	5427	41
HF CW	670	13
VHF Phone	80	4
Totals	6177	60

VK2 HF Phone

VK2ARJ	582
VK2BO	410
VK2DCL	403
VK2AYK	390
VK2PS	301
VK2NW	270
VK2UP	257
VK2EJW	225
VK2MUZ	209
VK2CAA/P	205
VK2LEE	198
VK2ANK	197
VK2CJT	122
VK2AXS	120
VK2AJI	107
VK2IV	105
VK2DDB	103
VK2GHZ	100
VK2ETK	99
VK2KGX	94
VK2DOJ	87
VK2BOT	85
VK2JQ	84
VK2GV	83
VK2JIM	82
VK2UC	70
VK2PN	60
VK2FBK	49
VK2CJH	48
VK2DQP	47
VK2XH	33
VK2ZW	28
VK2PEJ	24
VK2FJ	23
VK2AL	23
VK2MX	21
VK2GIZ	20
VK2GS	20
VK2RJ	20
VK2PY	12
VK2CF	11

VK2 HF CW

VK2CX	154
VK2GS	83
VK2DLO	80
VK2BO	53
VK2AIC	50
VK2GT	47
VK2GJS	39
VK2KM	35
VK2XH	33
VK2DQP	33
VK2QL	22
VK2EL	21
VK2RJ	20

VK2 VHF Phone

VK2ANK	34
VK2BDT	16
VK2JQ	16
VK2ALZ	14

VK3

	Points	Logs
HF Phone	8200	66
HF CW	929	18
VHF Phone	6641	48
Totals	15770	132

VK3 HF Phone

VK3ABO	592
VK3SAM	492
VK3ALZ	418
VK3GH	380
VK3DDX	287
VK3APC	272
VK3FR	261
VK3PD	247
VK3YH	229
VK3DS	201
VK3EPO	190
VK3NTV	186
VK3AEO	186
VK3PK	180
VK3ALK	170
VK3GRA	166
VK3CX	159
VK3DMK	157
VK3ANM	157
VK3SZ	156
VK3OM	154
VK3XF	152
VK3ABP	138
VK3DVT	127
VK3OP	125
VK3XK	122
VK3ENX	119
VK3NYL	116
VK3SOL	116
VK3EDP	113
VK3CRA	110
VK3DCS	100
VK3SM	95
VK3NJE	90
VK3DNC	89
VK3AHY	85
VK3MBU	73
VK3ACT	71
VK3BAS	65
VK3CLS	62
VK3BMG	62
VK3BGC	60
VK3RC	59
VK3AGJ	57
VK3EWD	55
VK3SV	54
VK3CHR	52
VK3PAT	50
VK3KT	49
VK3UJC	49
VK3PTR	47
VK3HG	40
VK3SAC	38
VK3NZO	35
VK3DYF	35
VK3CAY	30
VK3KTO	28
VK3JMB	28
VK3BKU	25
VK3BFN	25
VK3ALO	25
VK3AUI	24
VK3BJM	21
VK3JI	17
VK3EDP	16
VK3ADJ	11

VK3 HF CW

VK3FC	118
VK3DVW	108
VK3BMG	111
VK3DG	85
VK3DID	66
VK3XB	61
VK3BKU	99
VK3DNC	28
VK3KS	26
VK3AMD	43
VK3EDP	40
VK3ED	34
VK3NZO	30
VK3SM	25
VK3CQ	17
VK3VB	14
VK3FA	14
VK3JI	10

VK3 VHF

VK3ACR	846
VK3A8O	461
VK3FHP	461
VK3APC	424
VK3YID	388
VK3YZW	322
VK3BH	265
VK3DUQ	247
VK3ZNE	208
VK3ACT	174
VK3BGC	168
VK3KTO	159
VK3XMD	155
VK3MGS	150
VK3CRA	143
VK3KBD	138
VK3WEG	131
VK3XK	131
VK3JTA	127
VK3JUD	119
VK3JMB	117
VK3MOG	114
VK3CAP	113
VK3VB	93
VK3AUI	93
VK3ZI	87
VK3SM	78
VK3JMD	73
VK3GJA	57
VK3ZPF	53
VK3CLS	50
VK3AEB	49
VK3SAA	48
VK3ZW	47
VK3DVW	43
VK3BFN	35
VK3MFN	34
VK3JT	34
VK3AEO	33
VK3XX	30
VK3UFC	26
VK3XH	22
VK3PAT	21
VK3CAY	20
VK3ZUG	15
VK3ZKP	13
VK3JI	13
VK3AQ	13

VK4

	Points	Logs
HF Phone	5681	44
HF CW	722	13
VHF Phone	307	13
Totals	6710	70

VK4 HF Phone

VK4YB	683
VK4BB	494
VK4LT	481
VK4WID	353
VK4DRC	285
VK4NEF	275
VK4YG	270
VK4BAY	252
VK4ACW	155
VK4VO	144
VK4CRR	135
VK4PT	132
VK4QF	129
VK4AMD	129
VK4OD	127
VK4PS	125
VK4BSH	114
VK4PJ	110
VK4RM	108
VK4ADD	100
VK4AAK	100
VK4AGL	100
VK4OX	81
VK4ACL	80
VK4NEB	76
VK4SA	75
VK4MCY	73
VK4UJ	54
VK4DRM	53
VK4ZZ	40
VK4WIT	37
VK4PVH	37
VK4DV	35
VK4BG	30
VK4ZGL	30
VK4FB	28
VK4KRR	26
VK4ADY	25
VK4WIZ	25
VK4EV	19
VK4IW	16
VK4MOT	15
VK4OE	13
VK4LZ	12

VK4 VHF

VK4WIZ	98
VK4ZBV	34
VK4DE	25
VK4PJ	24
VK4YPB	21
VK4VR	21
VK4AHO	18
VK4BAW	12
VK4RX	12
VK4KE	12
VK4ANN	10
VK4GUY	10
VK4ZBD	10

VK4 HF CW

VK4CAG	130
VK4OR	114
VK4XA	97
VK4CI	93
VK4YG	70
VK4GD	40
VK4OD	37
VK4XW	34
VK4CF	28
VK4CRR	25
VK4BRZ	23
VK4VD	16
VK4SF	15

VK5

	Points	Logs
HF Phone	6898	44
HF CW	398	6
VHF Phone	2373	22
Total	9669	72

VK5 HF Phone

VK5AYD	549
VK5ATU	476
VK5ARN	440
VK5SU	425
VK5ARC	377
VK5CN	308
VK5GN	298
VK5EE	278
VK5BRC	265
VK5ABS	262
VK5BWH	255
VK5TT	251
VK5DK	207
VK5APC	160
VK5ATN	134
VK5NW	133
VK5AAC	126
VK5ST	125
VK5BGZ	123
VK5NF	117
VK5NJX	113
VK5BFB	107
VK5RV	104
VK5XI	104
VK5OL	104
VK5ZA	100
VK5LL	100
VK5ACM	100
VK5CJP	96
VK5KV	95
VK5NC	75
VK5ZQ	62
VK5ARV	59
VK5FOX	55
VK5PC	48
VK5SR	47
VK5WO	40
VK5IT	36
VK5RK	30
VK5AIM	26
VK5AV	25
VK5AKC	25
VK5AGB	25
VK5KJT	13

VK5 HF CW

VK5AGX	156
VK5MN	67
VK5HO	57
VK5TL	50
VK5NW	46
VK5JG	22
Total	398 points

VK5 VHF Phone

VK5TTY	503
VK5BRC	395
VK5AKK	270
VK5ZCV	264
VK5KIA	118
VK5ZIC	93
VK5RV	86
VK5ACM	85
VK5AAC	83
VK5ZDJ	80

VK5 VHF Phone (Cont)

VK5PC	51
VK5NW	50
VK5NE	46
VK5MD	45
VK5BW	36
VK5AIM	33
VK5ABS	31
VK5ZKK	27
VK5ATQ	21
VK5APC	21
VK5MX	18
VK5KCX	17
Total	2373

VK6

	Points	Logs
HF Phone	46	6071
HF CW	11	562
VHF Phone	48	4891
Total	105	11524

VK6 HF Phone

VK6SZ	605
VK6ANC	546
VK6UF	502
VK6ATZ	419
VK6ED	402
VK6DE	360
VK6HU	257
VK6SAN	257
VK6AMB	250
VK6JP	246
VK6ABS	202
VK6BGF	199
VK6GW	153
VK6VS	150
VK6SH	148
VK6IG	140
VK6RG	126
VK6YF	113
VK6PGG	109
VK6RU	90
VK6AV	78
VK6KH	65
VK6QN	58
VK6BEB	57
VK6RZ	49
VK6CX	44
VK6AI	42
VK6VZ	34
VK6KG	32
VK6PNS	32
VK6OE	29
VK6NTJ	29
VK6HK	27
VK6FC	25
VK6MM	23
VK6UT	21
VK6RR	20
VK6APK	20
VK6SAA	18
VK6SCS	18
VK6OU	15
VK6IV	14
VK6DRJ	13
VK6AN	12
VK6PDR	12
VK6AO	10

VK6 HF CW

VK6HQ	139
VK6AFW	111
VK6AJ	58
VK6PDR	55
VK6RF	52
VK6SM	52
VK6AF	44
VK6RU	15
VK6ED	12
VK6GA	12
VK6RZ	12

VK6 VHF Phone

VK6CX	540
VK6FJA	421
VK6ZDW	244
VK6AD	192
VK6JP	190
VK6BWI	182
VK6ZLZ	182
VK6SH	172
VK6SAA	169
VK6RG	165
VK6YF	162
VK6JIP	152
VK6SCS	140
VK6HU	138
VK6SAN	138
VK6RRG	136
VK6TTY	122
VK6ZPP	121
VK6YL	108
VK6QD	97
VK6QL	95
VK6LZ	82
VK6AXB	67
VK6DAX	67
VK6XWB	61
VK6AN	56
VK6JBL	56
VK6AMB	54
VK6AR	50
VK6WT	50
VK6KWN	41
VK6WIA	39
VK6FC	37
VK6HK	35
VK6RO	34
VK6ATA	34
VK6KW	28
VK6MB	27
VK6UT	24
VK6APK	24
VK6DC	22
VK6BY	21
VK6ZBP	21
VK6CW	20
VK6KG	20
VK6RZ	20
VK6FG	19
VK6UV	16

VK7

	Points	Logs
HF Phone	1393	16
HF CW	68	2
VHF Phone	1437	14
VHF CW	16	1
Totals	2914	33

VK7 HF Phone

VK7KC	299
VK7CK	263
VK7NGC	156
VK7SA	88
VK7KDV	81
VK7XR	81
VK7AL	67
VK7JP	60
VK7NBF	56
VK7YW	51
VK7LS	49
VK7SA	38
VK7PP	36
VK7GB	26
VK7RM	20
VK7EB	20
Total	1393

VK7 HF CW

VK7RY	43
VK7KA	25

VK7 VHF Phone

VK7KDV	260
VK7ZBW	164
VK7GL	156
VK7JWR	155
VK7YW	112
VK7MAT	106
VK7ZMF	93
VK7ZO	86
VK7EB	83
VK7AL	65
VK7SA	50
VK7LS	46
VK7RM	42
VK7ZJG	20

VK7 VHF CW

VK7ZO	16

VK8

	Points	Logs
HF Phone	102	1
HF CW	75	1
Totals	177	2

VK8 HF Phone

VK8UW	102

VK8 HF CW

VK8HA	75

New Zealand

HF Phone

ZL3TX	88
ZL1IM	169
ZL4AV	123

PNG

HF Phone

P29NRA	140
P29NJ	406

Listener Section

SWL-L50728	533
Peter Kenyon	226
Nora Young	208
Charles Thorpe	90
SWL-L60239	54
SWL-L50087	66

ar

VHF/UHF — AN EXPANDING WORLD

ERIC JAMIESON VK5LP — PO BOX 169 MENINGIE 5264

All times are Universal Time Co-ordinated (UTC)

Six-Metre Beacons

Freq	Callsign	Location	Grid Square
50.000	GB3BUX	England	IO73
50.005	ZS2SIX	South Africa	KF25
50.011	JA2IGY	Japan	PM84
50.012	OZ4VM	Denmark	JO46
50.015	SZ2OH	Greece	KM27
50.015	V51VHF	Namibia	JG87
50.017	JA6YBR	Japan	PM51
50.020	GB3SIX	England	IO73
50.020	CX1CCC	Uruguay	
50.021	OZ7IGY	Denmark	JO55
50.022	FR5SIX	Reunion Is	LG78
50.0245	ZP5AA	Paraguay	GG14
50.025	YV4AB	Venezuela	FK50
50.025	OH1SIX	Finland	KP11
50.025	6Y5RC	Jamaica	FK17
50.027	9H1SIX	Malta	JM75
50.028	JA7ZMA	Japan	QM07
50.029	CT0WW	Portugal	IN61
50.0325	ZD8VHF	Ascension Island	II22
50.032	ZS5SIX	South Africa	KG50
50.033	LU8YYO	Argentina	FF50
50.035	ZB2VHF	Gibraltar	IM76
50.035	ZS3VHF	South Africa	JG87
50.035	V73AT	Marshall Is	RJ38
50.039	FY7THF	French Guyana	GJ35
50.040	VO1ZA	Newfoundland	GN37
50.040	SV1SIX	Athens	KM17
50.041	FO5DR	TAhiti	BH52
50.042	GB3CTC	England	IO70
50.043	ZL3MHF	Christchurch	RE66
50.044	JR7YAG	Okinawa	PL36
50.045	OX3VHF	Greenland	GP60
50.045	YV4ZZ	Venezuela	FK60
50.046	VK8RAS	Alice Springs	PG66
50.0475	FX4SIX	France	JN06
50.048	TG4BFK	Guatemala	
50.0050	GB3NHQ	England	IO91
50.0050	ZS6DN	South Africa	KG44
50.0050	VE7SIX	Canada	DN09
50.051	LA7SIX	Norway	JP99
50.0525	ZL3MHB	Greymouth	RE57
50.054	VK3SIX	Hamilton	QF02
50.056	VK8VF	Darwin	PH57
50.057	TF3SIX	Iceland	HP94
50.060	GB3RMK	Scotland	IO77
50.060	PY2AA	Brazil	GG66
50.061	KH6HME	Hawaii	BK29
50.0625	GB3NGI	Northern Ireland	IO65
50.064	WO7Z	Arizona	EL59
50.0655	GB3IOJ	Jersey	IN89
50.065	NB30/1	Rhode Island	FN41
50.066	VK6RPH	Perth	OF78
50.069	K6FV	Woodside	CM87
50.070	EA3VHF	Spain	JN01
50.073	KH6HI	Hawaii	BL01
50.073	ZS4SA	South Africa	KG33
50.075	VS6SIX	Hong Kong	OL72
50.078	PT7BCN	Brazil	HI06
50.079	TI2NA	Costa Rica	EJ79
50.080	HC8SIX	Galapagos Is	EI59
50.080	SK6SIX	Sweden	JO57
50.082	VE1MUF	New Brunswick	FN66
50.082	HC6SIX	Galapagos Is	EI59
50.085	9HISIX	Malta	JM75
50.086	VE2STL	Quebec	FN46
50.0865	LU1MA	Argentina	FF87
50.090	KJ6BZ	Johnston Island	AK56
50.091	9L1US	Sierra Leone	IJ38
50.092	W5GTP	Louisiana USA	EM40
50.100	HC2FG	Ecuador	EI97
50.100	5H1HK	Tanzania	
50.110	A61XL	United Arab Emu	LL74
50.120	4S7EA	Sri Lanka	MJ96
50.321	ZS5SIX	South Africa	KG50
50.490	JG1ZGW	Tokyo	PM95
50.499	5B4CY	Cyprus	KM64
50.904	ZS1STB	South Africa	KF05
51.020	ZL1UHF	Auckland	RF73
52.100	ZK2SIX	Niue	AH50
52.310	ZL3MHF	Christchurch	RE66
52.320	VK6RTT	Wickham	OG89
52.325	VK4RHV	Newcastle	QF57
52.330	VK3RGG	Geelong	QF21
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart	QE37
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGB	Gunnedah	QF59
52.440	VK4RTL	Townsville	QH30
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PF95
52.465	VK6RTW	Albany	OF84
52.470	VK7RNT	Launceston	QE38
52.510	ZL2MHF	Mount Climie	RE78

Ron VK4BRG kindly sent me a condensed version of a recent beacon list which appeared in the KA3B newsletter. I have combined it with my own 6m beacon list, less the Australian beacons on 52MHz, as there are some beacons listed which may be useful even in the latter part of the equinox — thus it appears one month early. My thanks to the above for permission to reproduce.

Six Metres

September was relatively quiet with the occasion Es opening to VK4. However, on 8/9 around 0100 Col VK5RO was observed working W6ANE on CW and KG6DX at 4x4. It has even been quiet in Brisbane!

Hugh VK5BC said he had been hearing backscatter signals from VK4, VK2 and VK3OT. He also scored KG6DX on 8/9 along

with VK1RX, VK2GLS and VK4KK. On 11/9 there was an opening to Japan from 0545 to 0615. Beacons JA2IGY heard at 0603 and JA7ZMA at 0555. On 12/9 at 2340 Hugh worked KG6DX. Hugh said a "rough count" shows he has worked 45 countries.

Graham VK6RO has received confirmation of his contact on 27 April 1991 with 7Q7JA in Malawi. The operator, Yosi Kawaku, used a TS680S and a 70W amplifier to a five-element Yagi 15 metres high. Graham has now worked and confirmed 28 countries.

From Sarina

Ron VK4BRG from Sarina, in recent times has been sculling around somewhat; first a return visit to YJ8 where he met Simon YJ8GP. Ron has copies of his log and will be assisting by sending out required QSLs. Then it was off to China where he spent some time with BZ4SAA, and this will be the subject of a separate article in *AR* in due course.

Since arriving home on 24/8 Ron said there has been a reasonable quantity of TE propagation, mainly to KH6, V73 and JA most days. The following is a summary of such happenings: 26/8: 0028 to 0207 — 18 contacts, mainly to W5, but with some in W6, also K1HTV/3 in Maryland, which was a good catch. 30/8: 2349 K5CM. 3/9: 0005 to 0203 — 13 stations in W5. 5/9: 0809 BY4SAA who also worked a number of other northern VK4 stations. 10/9: 0022 WQ5S. 12/9: 0247 WQ5S; 0255 K5CM; 0831 KH4AF; 1008 JD1BFI Ogasawara. AH6Q/MM has been active again from the region of Japan. Ron comments that the single contacts to W5 in the main simply came "out of the blue" by him being there at the right time!

New distance records

Those aspiring to set world distance records on the 3456 and 5650MHz bands will need to cast their eyes to fields far beyond Australia as the result of two new records set on 28 July 1991.

On this date N6CA in Palos Verdes, California, made contact with KH6HME situated at an elevation of about 2500 metres (8200 feet) on the side of Mauna Kea volcano in Hawaii, first on 3456MHz, and a short time later on 5650MHz.

Whilst I hesitate to suggest these records may not be bettered, I think it would be safe to say they will stand for a long time. Congratulations to those involved. If my memory serves me correctly, I believe the 1296MHz and 432MHz records are over the same path.

On 2300 and 3456MHz Reg VK5QR and Wally VK6WG hold the Australian records for a distance of 1885.5km on each band. The 5650MHz record is held by VK5NT and VK5ZO at 176.4km. On 1296MHz Les VK3ZBJ and Wally VK6WG have worked 2449.3km and 432MHz VK3ZBJ to Wally VK6KZ/6 at 2715.9km. 144MHz is held by VK4BFO and JI7DMB for a distance of 6763km.

Long path records

On the 50-54MHz band an interesting situation prevails when determining the distance. During the past few years there has been evidence that short and long paths appear to exist, and not necessarily simultaneously. The Australian short path record is held by VK8RH with a contact to 8R1AH over a distance of 18,857.9km.

As long path distances are now accepted internationally, John Martin VK3ZJC, Chairman of FTAC, has made the following statement:

"Calculation shows that unless the path tends to hug the equator fairly closely, the figure of 40,008km for the earth's circumference is quite accurate. I have therefore calculated the short path distance and subtracted this from 40,008km to arrive at the long path figure. Due to the margin of error involved, I have rounded off these figures to the nearest kilometre."

The WIA is now issuing a "Certificate of Achievement" to those amateurs who have recorded distance records for their States. Recent awards have been made to Steve VK3OT for his VK3 record contacts with F6HWM on 19/10/89 for a distance of 16,887.8km, and to G4UPS on 19/02/91 at 16,921.6km.

Additionally, Steve VK3OT has received the award for the national record on six metres for his contact with 9Q5EE on 6 April 1991 over the long path distance of 27,186km. The short path distance was calculated at 12,822km. Congratulations — that long path distance will be hard to better.

Two other claims are being processed by John VK3ZJC for long path records — VK2BBR to 6W1QC for a new VK2 record of 21,384km and VK4ZAZ to 6W1QC for a new VK4 record of 21,741km. Also, a new VK1 record of 16,082km has been set by VK1RX to KP4A, and a new national mobile record of 16,242km by VK4ZAZ to FM5WD. Good work, gentlemen.

EME update

Doug VK3UM reports that he has always been on air for the North American windows, but has had to be content with mainly random QSOs. On 7/7/91 0030 he worked GJ/F6KSX for country 29; 2/8 2058 UC2U/UB4LL for country number 30. 3/8 1550 JA9BOH, 1608 K1RSA, 2218 ZL3AAD, 2324 OK1KR, 2338 UT5UAS, 2349 DL3YEE, 2356 IK5AVM, 2358 DF9QX.

30/8 2054 LA8LF, 2117 DF3RU, 2135 OK1KIR, 2148 SM4IVE, 2212 F1ANH. 31/8 2128 RB5LGX, 2225 HB9SV, 2235 JA2JRJ, 2249 DJ6MB. 1/9 1623 JA9BOH, 2225 SM4IVE and DJ6MB in a three-way SSB contact, 2303 UT6DL, 2313 DK0TU, 2321 SM6EUP, 2330 UT5UAS. The contact with DK0TU at 2313 represented Doug's initial contact number 145.

Six metres standings list

The next list is due to be published in the February 1992 issue, so input will be necessary by 15 December, please.

When the list was first offered about 10 years ago, I expected it would generate a reasonable degree of interest and there would be some rivalry amongst those near the top, but as it related to a hobby, I considered any rivalry would be friendly. Unfortunately, not all the rivalry has been friendly, and there have been accusations made about the credibility of some claimed contacts and QSLs.

With the advent of Cycle 22 and the excellent propagation conditions which resulted in so many good contacts being available to those prepared to really work at 50MHz, many amateurs suddenly realised they were assembling respectable tallies of countries worked. I suppose it was inevitable there would be some queries of who worked what and when, and in response to some apparent evidence I worked at the Standings List over a long period to ensure the claimed QSLs were accurate, particularly those relating to Cycle 21 in the early 1980s. In some cases there were rejections and withdrawals, but in the end I finished up with what seemed a satisfactory list. That's why amateurs were asked to send me their cards, copies of QSLs or a certified list.

After all this, I now find there are queries in regard to Cycle 22 contacts, with overseas amateurs becoming embroiled when they are written to and required to answer questions in regard to some of their contacts and QSL information. To say that some of them have not been impressed with the queries would be an understatement! So it seems to me there is still an amateur spirit out there which says you do not question your fellow amateurs' operating habits, at length, whether seemingly justified or not, unless the enquiry is made by someone at official level with a need to know!

I want to make it quite clear that what constitutes a valid contact for the world-renowned ARRL VHF DXCC Award, when a claim for that certificate is finally made, will be decided by the DXCC body and no one else. They will certainly not be accepting any QSLs from Australian amateurs for 50MHz contacts made between 1 January 1964 and 31 December 1984 inclusive, being that period when we were not permitted to use 50-52MHz.

From 1 January 1985 to 30 June 1989 there were restrictions placed on amateurs in VK2, VK3 and VK4 who were permitted operation only outside the operating hours of Channel 0 television, which meant virtually no legal operating at all from those states. VK5, VK7 and VK8 could operate at all times, but with reduced power, and there were no restrictions in VK6 — for details refer to page 5 of *AR* for August 1984. From 1 July 1989 most restrictions were lifted except for those stations operating within certain defined distances of

Channel 0 stations or translators.

What I am saying is that if any of you is planning to eventually submit QSLs for the ARRL DXCC VHF Award, then it is fairly safe to say the DXCC body will accept only 50MHz QSLs from VK2, VK3 and VK4, in particular, which are dated from 1 July 1989. If you worked countries prior to that date and as far back as 1 January 1964, then you had better ensure you have worked them again and received a QSL with an acceptable date or you worked them on 52MHz.

My Standings List will not matter one iota to the ruling DXCC body at the appropriate time. They have a lot of information at their fingertips and the slightest doubt about any contact will bring instant rejection, whether you like it or not! But that does not mean we cannot have a Standings List in Australia, one where all who are listed can gradually improve their totals, and if you're in doubt about the legitimacy of any of your contacts, for whatever reason, then obviously you would make an effort to rework the country to satisfy yourself and your place on the list.

I will be assessing the meaningfulness of the Standings List during the next few months, and if I believe it is not serving its original purpose then, with regret, after February 1992 it will be withdrawn. Therefore, I am looking for some support from the rank and file members.

Closure

Hopefully, by the time the December issue arrives, I will be able to report a flurry of activity on six metres for the October period.

Closing with two thoughts for the month: "The trouble with some self-made men is they insist on giving everybody their recipe" and "Marriage is like the army. Everybody complains — but you'd be surprised at how many re-enlist".

73 from The Voice by the Lake

ar

ALARA

Dorothy Bishop VK2DDB – 153A Galston Rd Hornsby Heights 2077

At the time of writing this month's column, three of my children are on school holidays so I thought I'd share an idea for a "toothpaste box" handheld that other mums and grandmothers may find interesting. I was involved with a playgroup for 15 years and used this idea as a craft activity once each year.

You need: A small empty box - a toothpaste or lolly box, etc - covered in plain paper; a small self-adhesive address label for the 'display' and some small round spots for the number buttons; a small foam circle and a paper fastener for the press to talk button; a pipe cleaner for the aerial.

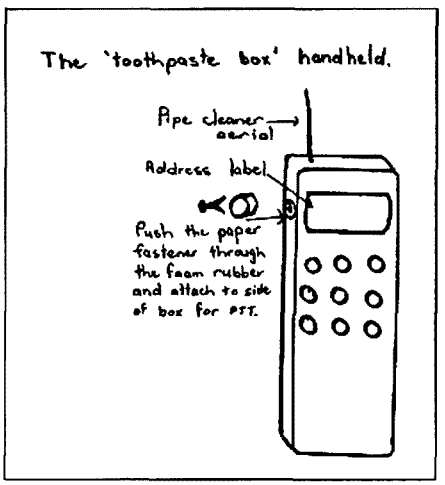
Assemble in the above order and write numbers on the "buttons".

It was followed by a short simple talk and demonstration - a prearranged 2m repeater contact. The Morse ident on the repeater led to a chat about Morse code and the phonetic alphabet. After a short question time, the children's names would be written on card in either Morse or phonetics. This activity was always very popular, and most mothers reported the next week that "aerial spotting" was the favourite pastime when out driving.

Today I had a chat with Joyce VK2MI. She was in the middle of making Christmas decorations and rather welcomed the chance to put the glue down. Joyce's OM, Dudley (then VK2LQ) was a keen CW man and Joyce originally intended to study only the Morse Code so she could listen-in to his conversations. She was steered towards the WIA Amateur Radio course and attended Florence McKenzie's classes for CW. Joyce was licensed in 1947 and remembers her first contact was "with a chap in Wentworth", who made the place sound so interesting that she always wanted to visit it.

Although she never did visit Wentworth, she regaled me with a story from "out west".

Just recently Joyce took a trip to Broken Hill, and on the ceiling of the hotel ballroom was a large painting of a reclining nude. There was to be a religious conference held in



the ballroom, so not wishing to shock the church dignitaries, the hotel staff pinned two flimsy scarves to the offending bits. However, much to everyone's' amusement, a gentle breeze rearranged the scarves.

Travelling Around

Some of our ALARA members have had extensive travels during the year. Most are settled back home now and the rest will be home for Christmas. Jenny VK5ANW and daughter Wendy left on 1 August for England and America, then returned via New Zealand where she met Alma ZL1WA. Helene VK7HD also left on 1 August for Canada. She enjoyed meeting Joan YD7YB, went touring in a motor-home convoy through breathtaking countryside, then came home to Australia via Hong Kong. Maria VK5BMT is home after six months in the northern parts of Australia. Marlene VK3WO visited Poppy VK6YF on her homeward run after a long northern trip. Mavis VK3BIR, also touring up north, says she thought there were more VK3/5 YLs mobile up north, than there were staying at home.

Welcome to new members Ruth GW7FNR, sponsored by Marilyn VK3DMS, and Barbara ZL3AHS sponsored by Robyn VK3ENX. Barbara is visiting VK2 for 10 days from 22 November and I am planning to meet her and hopefully let her talk to her OM (Alistair ZL3TT) who is at home minding the three children. I shall have to tidy the ham shack before then; in fact that is a job I should do before the ALARA Contest.

Washing the car and the windows hasn't induced the rain here.

Will our contest bring a storm and break the drought in Sydney?

Looking forward to catching up with every one on the ALARA Contest on 9 November 1991.

73/33 Dorothy

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More About the Cover

Members of ALARA participated in the promotion of amateur radio at the Hobby and Craft Fair held in Adelaide on 27 and 28 July. As 27 July was designated as ALARA's Birthday Activity Day for 1991, we operated HF from the stage of the Centennial Hall, seeking as many contacts as possible world-wide. We were surrounded by working exhibits of ATV, weather fax, satellite programs, another HF rig operating CW, as well as a display of vintage transceivers all set up by WIA members.

ALARA members are gearing up for our annual contest on Saturday/Sunday 9/10 November from 0001 to 2359 UTC. This contest is open to all licensed amateurs and SWLs worldwide, and a wide range of achievements is rewarded with certificates. Details have been published in October '91 *Amateur Radio*. This is a friendly contest with time for a brief chat whilst the contact is being logged, so we look forward to meeting lots of amateurs on the day. We promote CW by means of the Mrs Florence McKenzie Award for the Australian YL novice (ie not a full call) operator with the highest CW score — not necessarily an ALARA member — and I hear at least one operator is keen to win this year!

Meg VK5AOV

Secretary and VK5/8 State Rep AR

AMSAT

BILL MAGNUSSON VK3JT – 359 WILLIAMSTOWN RD YARRAVILLE 3013

Packet: VK3JT@VK3YZW

National Co-ordinator

Graham Ratcliff VK5AGR

Please take note of the AMSAT information nets:

AMSAT AUSTRALIA net:

Control station VK5AGR

Check-ins commence at 0945z on Sunday nights

Bulletin commences at 1000z

Frequencies 3.685MHz or 7.064MHz. At present 7.064MHz is used.

AMSAT SW Pacific net:

2200z Saturday on 14.282MHz.

Experienced satellite users and newcomers alike are welcome on the nets. A large body of experience is on hand to answer queries. Listen to the WIA Divisional broadcasts for regular AMSAT information.

AMSAT Australia Newsletter and Computer Software:

Satellite users, whether experienced or newcomers, will benefit by subscribing to the AMSAT Australia newsletter and software service. The newsletter is published monthly by Graham VK5AGR. Subscription is $20 payable to AMSAT Australia, addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide 5001

The newsletter provides up-to-date information on all current and planned satellite activity. Graham also provides a first class software service for satellite users. New software is reviewed regularly in the newsletter.

DOVE Update

Last month I mentioned that control station N4HY was uploading the new software for the digitalker. It seems this procedure is still in progress at the time of writing. DOVE has been silent for a week or so apart from the 2401.22MHz beacon. "S" mode is used to perform software uploads. All indications are that we won't have to wait much longer; keep listening on two metres.

RS Report

Bill VK3WEG reports that RS-10/11 and RS-12/13 have been providing some good interstate and local contacts during both day and evening passes. The ROBOTs are responding well to crisp, clean hand-sent CW. Some problems have been noticed during recent times of high solar activity with transponded signals varying in strength. Both 29MHz downlink and 145MHz uplink signals can be affected. Try these satellites during day or evening, they offer the best and cheapest way to "get your feet wet" in the amateur satellite area. Omnidirectional antennas and 25W of RF will usually do the trick. Doppler shift is minimal.

AO-10 Status

We can look forward to Oscar-10's usual period of activity around Christmas and into the new year. Although very much out of control, the old bird has provided many excellent contacts during this period over the past few years. There have been some problems lately with co-visibility of Oscars 14 and 22 putting extra load on AO-10's power source. These satellites have transmitters in AO-10's listening band and if they're close enough they can act like a continuous uplink signal and put an extra load on the batteries. As always when using AO-10, keep a watch on the beacon. It's now only a continuous key-down signal. Watch out for frequency change or FMing, which will indicate transponder overload. **Cease transmitting immediately if this happens.**

AO-13 Status

This satellite is in apparent perfect health, although it is still drifting further into the northern hemisphere. (Good luck for them, bad luck for us). We don't see apogees any more, so squint angles are not good. If it lives long enough, and there is some doubt, we should start to see good conditions again around 1995. Most activity in VK/ZL seems to take place around perigee and out to MA 100.

AO-13 transponder schedule until 12 December 1991:

Attitude : 180/0
Mode B : MA 000 to MA 095
Mode JL : MA 095 to MA 125 Except 17 Nov to 25 Dec
Mode LS : MA 125 to MA 130 B transponder OFF
Mode S : MA 130 to MA 140 MA 10-40
Mode B : MA 140 to MA 256
Omni antennas : MA 230 to MA 030

SARA: This satellite is a bit of a worry. Rather like the Pakistani BADR-1 in some ways. The problem is that, like BADR-1, SARA **is not** an amateur radio satellite, and yet it is transmitting in the 2m amateur radio band. It probably has slightly more legitimacy than BADR-1 in that it is an amateur **astronomy** satellite. It's a pity the 2m downlink frequency wasn't negotiated with AMSAT before launch rather than just appearing in the satellite segment, which is pretty crowded already and subject to some rather remarkable frequency juggling by amateur radio satellite designers. Let's hope this sort of thing doesn't become any more prevalent. SARA probably has more than enough educational merit to have warranted a spot in an amateur satellite band with a more co-operative effort by the designers.

MIR

Whilst on the subject of frequency management, it appears that MIR is to change to

Satellite Activity for June/July 1991

1. Launches

The following launching announcements have been received:

Int'l No	Satellite	Date	Launch Nation	Period minkm	Apg km	Prg deg	Inc
1991 —							
044a	RESURS-f11	26 Jun	USSR	86.8	269	192	82.3
045a	REX	29 Jun	USA	101.3	871	770	89.6
046a	GORIZONT 23	01 Jul	USSR	23h50m	35672		1.4
047a	USA-71	04 Jul	USA	704.6	20250	19451	55.3
047b	LOSAT-x	04 Jul	USA	92.8	416	402	40.0
048a	COSMOS 2152	10 Jul	USSR	88.7	266	188	82.3
049a	COSMOS 2153	10 Jul	USSR	89.0	292	192	64.9
050a	ERS-1	17 Jul	ESA				
050b	UOSAT-F	17 Jul	ESA				
050c	ORBCOMM-X	17 Jul	ESA				
050d	TUBSAT	17 Jul	ESA				
050e	SARA	17 Jul	ESA				
051a	MICROSAT-1 THROUGH	17 Jul					
051g	MICROSAT-7						
052a	RESURS-F12	23 Jul	ussr	88.7	261	195	82.3

2. Returns

During the period 36 objects decayed including the following satellites:

1981-017a	HINOTORI	11 Jul
1991-036a	COSMOS 2149	04 Jul
1991-044A	RESURS-F11	21 Jul

3. Notes

1991-050B UOSAT-F

This spacecraft operating within the 2m and 70cm amateur bands was named OSCAR 22 (or UOSAT 5) after launch. The 1991-050 series of satellites was launched by the same ARIANE rocket booster from the Kourou Space Centre, French Guiana.

BOB ARNOLD VK3ZBB

ar

145.975MHz, which is a frequency used by AO-14. Beats me why. There're sure to be times when they will be in range of each other. Only time will tell how this works out.

Gateway Stations

The "packet" satellites UO-14, AO-16 and LU-19 are all working well and have come through their commissioning with flying colours. The question now is how long before we see them integrated into the terrestrial packet networks by gateway stations. In our part of the world at the moment there is only one ZL station actively feeding material into the system from UoSAT-3. It offers an excellent way of getting the latest worldwide news as quickly as possible. Unfortunately a completely automated system is a costly business. Maybe we'll eventually see a couple of VKs set up gateway stations. It'll beat the pants off the HF packet system for overseas mail! ar

EDUCATION NOTES

BRENDA EDMONDS VK3KT – PO BOX 445 BLACKBURN 3130.

It is now some time since the topic of alternative entry paths to an amateur licence was discussed. Perhaps, considering the furore that developed over the examinations proposals when the WIA began to implement a policy which had been established some years previously, it is time to reconsider and review the situation.

Over the years a number of schemes have been proposed, all aimed towards increasing amateur numbers by making the hobby more attractive and more easily entered. Three main proposals come to mind - a lower level theory with emphasis on Morse code, a digital-type licence to attract the computer enthusiasts, and a code-free Novice licence. Others have proposed a restructuring of the present licensing system, with use of various modes permitted only after passing an examination on that topic. An Executive Sub-Committee is at present investigating some of these proposals.

The 1988 Federal Convention, in accepting the report and recommendations of the Future of Amateur Radio Working Party, endorsed the proposal for a code-free Novice licence. (This report was published in the April 1988 issue of *Amateur Radio* magazine) At that time, Novice privileges were being extended to include the 146-148 MHz segment. It seemed appropriate to consider entry via a Novice level theory examination without a code qualification to permit operation only on the 2m segment. To seek approval for this licence has been WIA policy since that date.

We need to consider sometimes what it is we are trying to do. Are we encouraging recruitment into the hobby simply for the sake of greater numbers (and thus presumably greater strength)? Or are we so proud of our hobby and so excited about it that we wish to share our enjoyment more widely? Perhaps we should be discouraging any increase in numbers to forestall the inevitable band overcrowding and interferences. Should we aim for an even more exclusive hobby, with a higher standard entry level, so that it is only the really dedicated who are able to obtain a licence?

I have previously raised the question of the groups that are being addressed in any recruitment campaign or with the development of a new licence level. It becomes ever more apparent that the days of the excited young student are past. Most of the youth today are blase about radio, and see little difference between amateur radio and CB, except for amateur radio you have to learn Morse code. The excitement of direct contact with a foreign country is somewhat dimmed when we have had television cameras sending images from a war zone, and satellite telephone linkages are commonplace. If we are to attract that generation, we must give it a simple easy way to enter, and a lot of encouragement in early contacts.

There are two groups that could make up the main part of our new recruits, the retirees and women. These groups have been neglected in the "Get them young" campaigns. There is considerable talent and enthusiasm waiting to be tapped by any Club or Division which sets out to attract new recruits from these groups. Perhaps a code free licence is the way to show these recruits what amateur radio has to offer, and to allow them to show what they can offer to amateur radio.

Look around your Club membership, and see where your most recent members have come from. If your Club is doing its job, your newest recruits should be the ones most active in encouraging more recruits. If the most newly licensed are hesitant about participating in Club activities, or fail to maintain the enthusiasm which carried them on to get their licences, the Club, and the whole amateur body, is letting them down.

73 Brenda

ar

Remember to leave a three-second break between overs when using a repeater

HOW'S DX

STEPHEN PALL VK2PS – PO BOX 93, DURAL 2158

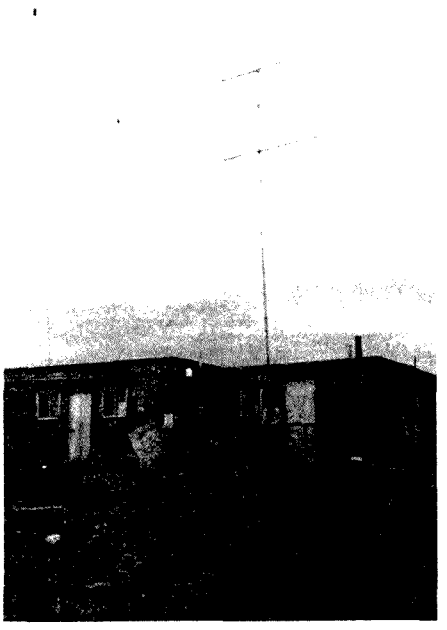
I wonder sometimes whether the message gets through at all. What message? The simple message of: listen, and listen again, before you transmit.

I am talking about the unacceptable behaviour and technical incompetence of many so-called modern DXers who are unable to handle pile-ups caused by the appearance of a rare DX station on the bands. The case in point was the recent activity from Myanmar (XY0RR) and from Albania (ZA1A). Most of the time, both stations worked a "split" frequency operation. In simple terms: they transmitted on a given frequency and listened on a different frequency, usually "up" 5-7kHz or even 60-70kHz away from the transmitting frequency.

If you have an old-style station with a separate transmitter and a separate receiver, this kind of operation should pose no problem for you. If you have a modern, but not so new, transceiver with one VFO only, you have a problem, and you should not attempt to work a station which does not operate in the transceive mode (transmitting and receiving on the same frequency). If you have a new-style modern transceiver with twin VFOs, you ought not to have a problem, but it appears that many of the DXers — among them well known callsigns — have a problem, because they do not know how to operate the twin VFOs and the simple memory channel bank which regulates them.

Blundering into a silent transmitting frequency without listening first for a reasonable time invites disaster. You will have instant reaction from the dozen or so "policemen" who sometimes, not so politely, will tell you where to go, thus causing a bedlam which completely wipes out the DX station transmitting frequency. Actions like this will not help and cause more frustration for everybody. So please listen first.

Finding out the listening frequency is reasonably easy. Just find the pile-up. By listening on the DX station transmitting frequency, you should be able to find out the DX station callsign, the QSL information and the frequency or frequency range where the DX station is listening. This procedure might take some time, so be patient and listen and listen. Listen to the pile-up. You will find it moves up and down in the frequency range given. By studying the response behaviour of the pile-up, you should be able to judge the listening method of the DX station. Check the transmit and receive frequency again, make sure the VFOs are correctly set and that your hand can do the switching (this really depends on the technical "finesse" of your equipment) of channels independently from your eyes, which are focused on the frequency display. Naturally, if you have a "VOX" it will help to activate your microphone, otherwise you use your free hand and your instant reflexes to operate the PTT switch. Take a deep breath and have a go. Good luck!



The living quarters of Peter VE8PW. Dipole antennas in the background.

Albania — ZA

Finally, it happened. On 17 September, around 1320 UTC, ZA1A appeared on 14145kHz. The first days of the activity were chaotic. After a solid three days of working the USA almost exclusively, then another three days of working the Japanese and, in between, the Europeans, ZA1A finally turned its attention to the South Americas, the Pacific and VK/ZL on the longpath around 0500 and 0600 UTC. This gave us in the Antipodes the opportunity to work Albania after many months, many years and even after decades of waiting. Some interesting background information:

* Eight complete stations with multiple beams and amplifiers were donated to the Albanian Radio Amateur Transmitting Society by a Japanese radio amateur equipment manufacturer.
* The visiting operators and training groups were allowed into Albania without a visa, courtesy of the Albanian Government.
* The establishment of amateur radio in Albania is the result of a two-year project. This involved visits to Albania by Martii OH2BH, and visits by Albanians to Finland.
* It is also noted that the General Secretary of the ITU (International Telecommunication Union) is a Finnish national, Dr Pekka Tarjano, who was present when the first contact was made between the ITU headquarters in Geneva and the PTT in Albania.
* Whilst all these activities have taken place in Tirana, the President of the Albanian Republic was in Finland to sign the well-known treaty for European security and arms reduction on behalf of his country.
* The ZA1A station was located at the PTT

When not chasing grizzly bears, Peter VE8PW relaxes with amateur radio.

headquarters and access was limited. Night-hour operation was not possible.

* It is expected that ZA1A will shut down on 7 October. Hopefully other Albanian national stations will be active afterwards.
* The present Albanian radio amateur student base is very well qualified. Out of 11 applicants in the class, eight are engineers, representing several government and education institutions.
* The opening ceremony was attended by 50 important local and international officials, and the event was televised on Tirana television.

You might ask the question: well, what happened to the Hungarian groups which for years tried to operate from Albania? They did not get lost, but turned up around 24 September in Tirana, the capital of Albania. Z1AQA was operated by HA0MM and HA0NNN. The second group, ZA1HA, was operated by Zoli HA5PP. Both groups arrived almost at the same time, and set up station about 3km away from each other. The DX fraternity of the world could not believe what they were hearing. After years of waiting, not one, but three, Albanian stations operating at the same time? This must be a miracle? Well, it was not, but no sooner had the Hungarians started to be active than the validity of their licence to operate came under a cloud of doubt. From this distance, from VK, it is difficult to see or understand the "ins" and "outs" of real politics and amateur politics of the situation. Whilst ZA1A is operating with the approval of the Albanian PTT with a licence issued by the Albanian Radio Transmitter Society, the Hungarians (both groups) are operating with a licence issued by the Albanian Ministry of Sports, which authority, according to the Hungarians, has the power to issue a radio amateur licence.

It has to be noted that under the previous system in the Eastern European countries amateur radio was regarded as a sport and was attached either to the Ministry of Sports or under some other guise to the Ministry of Defence. It appears to me — and I may be totally wrong on this issue — that due to the somewhat confused political situation in Albania, both authorities have the power to issue such amateur licences. The necessary paperwork was submitted by both groups to the ARRL. To the query by the ARRL whether the Ministry of Sport has the power to issue such a licence, both Hungarian groups have submitted further documentation.

Such is life and amateur radio politics in this small country on the Adriatic coast in Europe. A decision by the ARRL is expected soon.

Incidentally, ZA1QA indicated it will work on all bands, including WARC, and intends to stay until the end of October. QSL for ZA1QA goes to: Quick Aid Foundation, PO Box 5, Komoro, H-4622, Hungary. ZA1HA intends to stay until the middle of October. QSL to: PO Box 49, H-1311 Budapest, Hungary. Both groups accept voluntary donations.

Myanmar — XY0RR
Vietnam — XV
Spratly Is - 1S1RR

The Mynmar DXpedition of Romeo and his friends is now in the past. It appears the expedition has taken place, not on an island, but in the area of the Golden Triangle, which is the area between Myanmar, Thailand and Vietnam, and it is not the most peaceful part of that country. Only wire antennas were used, because putting up a log period antenna was "dangerous", according to the reports received in the US. Some of the expedition members had stomach upsets — they ate only once a day — and all the operators suffered from "battle fatigue". For whatever reason, they had to keep a low profile and the signals were not too strong. Activity was on all bands, and it was reported they made 50,000 contacts before they left on 11 September.

Where did they go from there? Home? You have guessed it correctly. They went to Vietnam and operated under the following callsigns: XV9MA (UA9MA), 3W3RR (UB5JRR — Romeo), XV3UU (RA9AUU) and 3W/4K2OT. Activity was on 14195, 21295kHz SSB and on CW at the low end of the bands. Each operator gave directions independently for QSLing.

After a few days of Vietnam activity, the callsign 1S1RR surfaced on the band from Spratly Islands. It was a four-day activity. Many who previously missed out working this island took the opportunity to work this still rare DX country. QSL goes to: Roman Stepanenko, PO Box 812, 1000 Sofia, Bulgaria.

Contrary to previous rumours, the mail is safe in that box, which is also used for the YA0RR, XY0RR and for the 1S1RR activity.

St Brandon Island — 3B7

St Brandon Island and Agalega Island — 3B6 are dependencies of Mauritius, and lie east of Madagascar and north of Mauritius in the Indian Ocean. Jack 3B8CF/3B7 was very active during September and in the first week of October. Due to work commitments, he preferred nets for SSB operations, but was quite active freestyle in CW on his preferred 21030kHz. He visited the "Anza" net (21205kHz) on more than one occasion, thus giving the opportunity for many VKs and ZLs for a rare DX contact. QSL direct to his home call: 3B8CF: Seewoosankar Mandary, Shastri Road, Candos, Quatre Bornes, Mauritius.

Vietnam Visit by US Amateurs

A six-man American team, many of them Vietnam veterans who speak the Vietnamese language, planning to travel to Saigon (Ho Chi Minh City) during November/December for a 10-day DXpedition. All of them are well known DXers and contesters (Paul AA2AV, Dennis N6KI, Dennis WJ2R, Terry W6MKB, John AB6BH and Mike KM1R). The budget for this DXpedition is estimated to be in the vicinity of $25,000, of which half will be met by the team members. ICOM America has lent HF equipment and linears, but they are looking for further donations to cover the balance of the costs. If you can spare a few dollars, why not send them to: AVDXT (American Vietnam DX Team) PO Box 875, Rahway, NJ 07065 USA.

Fraser Island — VK4

As a DXer, you often hear IOTA (Islands On The Air) numbers quoted on the air by those who decided to "collect" islands on the air for the respective awards. Fraser Island is listed in the international IOTA directory as one such of these islands, which qualifies for such an award. The first known radio amateur activity in recent times from the island was by Graeme VK3BYO, who worked portable from the island (IOTA OC-142) in July this year. His short activity created interest in this, the world's largest sand island.

A few weeks ago, Peter VK4AEI and his friend Bruce VK4NDW decided to have a quiet fishing trip on the island. They installed a portable HF radio set on their four-wheel-drive vehicle, probably to use it and to kill time when the fish were not biting. On 13 September, when calling for contacts, they innocently mentioned to the listening amateur fraternity that they were on Fraser Island. Suddenly the whole world wanted to work them. It took some time before they realised the subject of the great interest was not their very ordinary VK4 callsign, but their locality.

The island itself lies immediately due east from the Queensland city of Maryborough, a few nautical miles off the coast and about 190km north of Brisbane. It is approximately 60km long and about 25km wide, narrowing to about 4km at some sections. It covers an area of 184,000 hectares of sand with extensive beaches, magnificent coloured sand cliffs,c reeks and numerous freshwater lakes. There are a number of shipwrecks in the surrounding waters of the island.

The brig *Stirling Castle*, commanded by Captain James Fraser, sank in 1836 north of the island. Among the shipwrecked survivors who made their way to the island was the now-famous Eliza Fraser, wife of the stricken ship's captain. Her adventure brought worldwide notice to the peaceful island and eventually led to the area being renamed Fraser Island.

But, back now to amateur radio. To satisfy the demand for this IOTA island, the Hervey Bay Amateur Radio Club will activate the island using the club callsign VK4CHB/portable from 1 November for 10 days. Judging by the success with the VI4HBW special event station, it looks like they are on a winner this

time again. QSL to: Hervey Bay ARC, PO Box 829, Hervey Bay, Queensland 4655.

Up in the Icy North — VE8PW

If you are after the "Worked all Zones" award, you are probably aware of the fact that to secure a contact in Zone 2 is not an easy task. At the end of June this year, I was fortunate enough to have a short QSO with Peter VE8PW, and asked him what hé is doing up north so far away from the settled parts of the Northwest Territories of Canada? His reply QSL card, noting that he is in Zone 2, arrived promptly with an interesting letter and photo. Let me share the contents of his letter with you.

"My QTH is located at 65°N and 98°W, in CQ Zone 2 in the middle of the barren lands, within the district of Keewatin, Northwest Territories, some 500 miles south of the magnetic pole. I am operating from a geophysical research station which is manned 6-8 months of the year, and of which I am the project manager," writes Peter.

"We live in trailer-type cabins and get our power from a 12kW diesel generator. On the average there are 20-25 people in the camp, and fortunately I am the only ham operator so I don't have to fight for air time. The closest settlement is a small Eskimo hamlet on an inlet from Hudson Bay, some 80 miles to the southeast. Access to this place is by air only, and we move around the area in helicopters. Food comes in once a week by ski or float plane. There is a wide variety of wildlife, from caribou to grizzly bear, which sometimes ventures right into the camp. Lots of birds, and fishing is excellent.

"HF operation from here is quite unique due to the geographical location.

"We are only 500 miles south of the magnetic pole so the recent sun-flares have played havoc with propagation this year. Permanently high winds and the permafrost ground which is constantly frozen down to 250m almost, forbid operation of larger HF beams and towers. I therefore prefer simple wire antennas. You don't have as strong signals as you might want, but at least it keeps you on the air. Under normal conditions VK and ZL are best between 1100 and 1400 UTC, and I can hear and work VK4OH in his net with good signals on many days. Best bands are 20m and 17m, with 15m on and off. My QSL info is via the callbook or the VE bureau, and I QSL 100 per cent. My antennas are dipoles for 20, 17 and 15m. In the camp here, we made a spotlight which is very much needed in the months of darkness, to show grizzly bears or caribou which sometimes like to hang around the shack door. Lost two coax cables to a curious bear already. My other equipment is quite simple, just a barefoot IC-735 and a tuner. Thanks again for your direct QSL which was my first VK2!" — concludes the letter from Peter. His address is: VE8PW Peter Wollenberg, 125 Albertus Av, Toronto, MR4 1J6, Canada.

Future DX Activity

* Rumour has it that FR5AI will operate from Juan de Nova Island as FR5AI/J from 15 October to 28 November.
* Swedish missionary Mats SM7BUA will return to Ecuador to continue his missionary work. He will be there for three years and is expected to be active as HC7SK. QSL to: SM6DYX.
* Bing VK2BCH was still in Rotuma at the end of September operating as 3D2XV. However, expect him to be on Tuvalu after 8 October with the callsign of T20XV.
* The injuries of monk Apollo SV2ASP/A on Mt Athos were healing much quicker than expected. He can be heard now on Zedans net, 14251kHz at around 0430 UTC.
* Crozet Island is still active on 14020 CW around 1200 to 1300 UTC. Work him while you can, because Jean Claude returns to France at the end of November.
* It was reported that FR5ZU/G is now on Glorioso Island. He will later proceed to Tromelin.
* V63YL will be active from Micronesia for one year (IOTA OC-012). He is expected to be active on 14180, 14305, 21180 and 28375kHz.. QSL direct only to: Jarl Lundstroem, PO Box 687, Yap Island, Federated States of Micronesia, 96943 via Hawaii.
* Listen for Kermadec Island (IOTA OC-039). George ZL8GBS is a conservation officer and arrived at Raoul Island mid-September. He is a newly licensed operator, and it is said that he will not be very active, and he has not yet acquired the taste for DXing. So be patient when the pile-ups occur. QSL direct to this address: George B Simpson, Department of Conservation, Raoul Island, Overseas Mail Branch, CPO Auckland NZ.

Interesting QSOs and QSL Information

Note: callsign, name, frequency, mode, UTC, month

HC8GR Guido 14148-SSB-1056-Sep. QSL to: Guido E Rosillo Ojeda, Puerto Baqurizo, Moreno, Isla San Cirstobel, Galapagos, Ecuador.

JT1BV 14197-SSB-1135-Sep. QSL: via Bureau.

3B8FG Abid-14022-CW-1315-Sep. QSL to: Abid N Solim, 13 Napier Broome St, Beau Bassin, Mauritius.

ZS9S John-21205-SSB-0626-Sep. QSL to: PO Box 2480, Walwis Bay, Zip 9190, Republic of South Africa.

FT4YD Lorrain-14222-SSB-0704-Sep. QSL to: D Bruriaud, PO Box 1, F-71140 Vitry/Loire, France.

FW/F05IW Stan-14208-SSB-1402-Sep. QSL to: Stan Wisnienski, Box 2139, Papeete, Tahiti.

4K1B-14006-CW-1245-Sep. QSL to: UV6AAP.

VK9YJ Peter-14015-CW-1109-Sep. QSL to: VK3AWY Peter James, Box 60, Lara, Victoria 3212.

CU2QN Luiz-14009-CW-0808-Sep. QSL via the Bureau.

ZK1OQ Lars-North Cook-14200-SSB-0645-Sep. QSL to: SM5BOQ Lars Nordlund, Rankhusv 15, S-19630, Kungsengen, Sweden.

T20WW Joe-14222-SSB-0750-Sep. QSL to: NW3W Joseph M Raynak, 2766 Coltwood Dr, San Jose, CA 95148 USA.

C21BR Brian-14222-SSB-0557-Sep. QSL to: Box 478, Republic of Nauru, Central Pacific.

XU1NQ-21027-CW-0900-Aug. QSL to: Josef Kordac, Lounskych, 3, 888, CS-14000, Praha 4, Czechoslovakia.

A35TX-21022-CW-0600-Aug. QSL to: Tadashi Hashimoto, 40-7, Daigokuden, Kai Decheo, Mukah, 617, Japan.

OH0MM-21024-CW-0900-Aug. QSL to: Vilho Hiilesmaa, Rukuunantie, 18A 21, SF-00330, Helsinki, Finland.

TI0RHU-Hermes-21205-SSB-0533-July. QSL via the Bureau.

VP2MLD-Lawton-21205-SSB-0557. QSL to: KC4DWI B D Kellam, Box 936, Cheriton, VA 23316 USA.

XV9MA-14195-SSB-1200. QSL to: UA9MA Gennady I Kolmakov, Box 341, 644099, Omsk, USSR.

RTTY News

Syd VK2SG sends me quite a long list of RTTY contacts each month. Here is a sample as it appears in print.

* 7Z1IS-21074 at 1100Z. ARQ. QSL to: OE6EEG.
* HL9HH-14083 at 1245Z. QSL to: UB5QDF.
* TA7E-21075 at 1207 Z-ARQ. QSL to: Box 76 Trabzon, 6100 Turkey.
* 4K20IL-14088 at 0923z. QSL to: UA9MA.
* 9Y4VU-21085 at 1705 Z. QSL to: W3EVW.
* C9RTC-21095 at 1755 Z. QSL to: IK8QIZ.
* 9K2ZZ-21086 at 1418Z. QSL to: W8CNL.
* ST0DX-21084 at 1930Z. QSL to: WA2NHA.
* KC6DX-14082 at 1012Z. QSL to: JA2NVY.

From Here and There and Everywhere

* Les VK4DA was wondering whether a QSL card from St Barthelemy Island would count as a DXCC country? Due to political boundaries, cards with a FJ or FS prefix, whether from Barthelmy Island or from the French part of Saint Martin, count as one DXCC country, and a PJ5-8 card from the Dutch part of the same island, called Sint

Maarten, or from Saba Island and/or from Sint Eustatius island, count for another DX country.

* HS0AC the station of the Radio Amateur Society of Thailand, is often on the air operated by various guest visiting amateurs. It can be worked usually around 1200 to 1300 UTC on both CW and SSB on 14MHz.
* Are you confused about the Soviet 4K prefixes? Neil VK6NE gives the following explanation: 4K0 = drifting stations on ice floes. The following are situated all above the Arctic Circle: 4K2 = Franz Josef Land 4K3 = European islands; 4K4 = Asian islands.
* Peter VK9YJ (VK3AWY) returned from his recent trip to Cocos/Keeling Island. He apologises for the delay in sending out cards for his first trip earlier this year, but he was and still is very busy in his profession, having spend only one month at home in the past six months. However, he promised that the March cards will be out soon.
* The DXCC vote on the future DX status of Jarvis Island is expected to be handed down at the beginning of October.
* Do not be surprised if Bangladesh will be activated in the near future. Jim VK9NS is planning a few weeks activity in that country, and will go as soon as approval arrives from Dacca.
* The 1100 UTC "Family Hour Net" on 14226, controlled by Gray VK4OH, had its 157th DX country check-in this year.
* VK9WI appeared on the bands, claiming to be on Willis Island and giving Jim VK9NS as his QSL manager. When Jim rang Willis Island to make enquiries he discovered two things: that VK9WI is probably a pirate and no such amateur exists on Willis Island, but Willis Island, on the other hand, has a genuine licensed amateur in the person of Graham, with an unusual callsign of VK9GS. Home call VK3DSB. Unfortunately, Graham, who has been on the island for quite some time, is not a very active amateur, let alone a DXer. This is the reason why he remained unknown and hidden on this sunny island of the Coral Sea.
* VI6SR was a special event station operated by Tom VK6MK on 20m celebrating the discovery of Western Australia 200 years ago on 29 September 1791. Unfortunately, this news came too late to receive effective publicity. All VK radio amateur clubs and individuals please note: Let me have the details of any special event station or planned activity as soon as the special callsign has been issued by DoTC.

QSLs Received

Note: W = week; M = month; Y=Year; FM = from; MGR = manager and his call; OP = operator and or callsign.

Direct cards: S79KMB (4W FM MGR KN2N), GW4JQQ (4W FM OP), 7P8EG (3M FM MGR K0JZM), ZK2XA & ZK2XB (7M FM MGR DJ1ND), VP8CGK (4M FM MGR VK4MZ), HK0TU (10M FM MGR HK3DDK0.

Bureau cards: OA4OS (2Y FM OP), YV1CP (2Y 2M FM OP), 5N9NRK (1Y 8M FM MGR HB9WU), A41KJ (2Y 7M FM OP), TK5FF (1Y 9M FM OP), PJ2WOL (1Y 7M FM OP), WB3KBZ/VP9 (1Y 7M FM OP), WH6ASW/IM0 (2Y FM OP), IX1BGJ (1Y 9M FM OP), SV9/DL6RAI (11M FM OP).

Thank You ...

to all my helpers a big thank you, but specially to the following: VK2BEX, VK2CMV, VK2DID, VK2KFU, VK2QL, VK2SG, VK3DD, VK4DA, VK4OH, VK5WO, VK6NE, VK8KV, VK9NS, VE8PW, and the following publications: *QRZ DX, The DX Bulletin* and the *DX News Sheet*. Good DX and 73. ar

EMC REPORT

HANS RUCKERT VK2AOU – 25 BERRILLE RD, BEVERLY HILLS 2209

1. "Frequency-Bundle Net"* for mobile and handheld commercial communication presents a serious threat to the 420-50MHz amateur band operation. This form of cellular radio telephone operation uses the following frequency bands: Netherlands 403-420MHz; Germany 410-430MHz; Bosch Co 450MHz; Motorola Co 403-433MHz and 438-470MHz. We know the Amateur Radio Service is the secondary user, permitted on a non-interference basis. We have to use very highly sensitive receivers and also quite strong transmitters (high ERP) to be able to use the OSCAR satellites. The highly directive high-gain antennas and the elevation often needed will reduce the danger of interference to the commercial as well as to the amateur service.

*Information from *Funkschau* magazine, Germany.

2. "Radio Communication" June 1991 (submitted by Norm Burton) brought again some helpful recommendations to overcome EMC problems caused by computers and monitors. When cables to be screened have fixed moulded plugs, which cannot be removed, a 70cm length of braid (from 12mm diam coax) can be wound around the cable, and along this braid a *straight* strip of braid (from 6mm diam coax) is held by insulating tape, to assure the shortest possible path for RF. It is often recommended that a ferrite choke be inserted as close as possible to the equipment. However, in this case, stray radiated RF would bypass the choke. Instead, the choke should be inserted some 30cm from the equipment.

The earth wires, connecting for example a computer to the monitor, have too much RF resistance (inductive reactance) and they should be replaced by 10cm wide braid or foil strips.

3. Interference to and from cable TV operation using channel S-6, operating on the partly exclusive 144-148MHz amateur band. Tests were carried out with a manufactured "Searcher Plus" field-strength measuring receiver. This receiver has 2-200µV/m and 20-2000µV/m channel S-6 signals were received. In the city of Recklinghausen, Telecom-Germany informed the companies which installed cable-TV about the problem, asking them not to use low quality cables, connectors and plugs.

4. TVI and the Weather

It is not necessarily the radio amateur next door who causes severe interference to UHF-TV (channel 28) reception, like loss of colour, synchronisation and fluctuating snow. When the location of the TV receiver antenna does not present a "line of sight" condition to the TV-transmitter antenna, and only a stray signal is received over a hill, problems are likely at times. Air turbulence causing strong wind gusts, even without rain, can ruin the UHF-TV reception. No receiver re-tuning helps here. We know weather radar is being used to find cyclones, and jet planes similarly use radar to discover air turbulence areas to avoid flying suddenly into these, causing planes to drop suddenly several hundred metres. Our communication to relay stations and satellites could also be affected in this way.

ar

REPEATER LINK

WILL MCGHIE VK6UU @ VK6BBS – 21 WATERLOO CRS, LESMURDIE 6076

Squelch Tails Two

Last month's Repeater Link contained the idea of a second Squelch to improve the action and over all sensitivity of your repeater's squelch.

This month I have included a simple block diagram to help in installing a second squelch. This particular block diagram is a copy of the addition to a Philips FM828. As receivers vary in their design, the specific circuit has not been included. If you would like the circuit design, let me know.

With reference to the block diagram, the top half is the existing receiver's squelch and the bottom half the added squelch. The emitter follower is to avoid downloading the existing squelch circuit. C1 can be reduced in value to produce a fast squelch closing on strong signals. C2 should be the standard value, that is the original value of C1. The Schmitt circuit switches at a level set by the squelch sensitivity. For the added circuit this around 0.5µv. T1 switches into circuit CD which adds the squelch delay to the main squelch.

Some experimenting with values is required, but you may like to adapt this idea to your repeater. The results when fitted to the FM828 produced a silent squelch on strong signals, with the ability to hang onto weak fluttery signals with no chopping.

Portable Repeaters

Have you ever been involved in setting up a portable repeater? It may have been for site evaluation or for emergency use. Whatever the reason, we have all shared something in common, and that is it can be fraught with problems.

De-sensing is the end result of a multitude of portable on-site problems. The duplexer is one area, aerials another, and so the list goes on. All these problems can be solved, and I'm sure many amateurs have portable repeater systems that work well. When there is a problem with a portable repeater, it can be frustrating for those involved. A portable repeater is usually relied on, and when it does not perform, a large part of the communication system falters. Rather than battle on with mixed success, consider the following solution:

The problem for portable repeater systems can be solved by increasing the separation between the input and output frequencies. It is that simple. With 3MHz of separation the isolation required drops from 90dB to 60dB in round figures. The figure of 60dB is somewhat conservative, it depends on the repeater equipment in use.

The duplexer requirements drop by a large amount with such wide separation. Whereas six cavities are usually required for 600 kHz spacing, a two-cavity filter will do the job. The saving in space and weight is considerable.

Split aerial systems with no cavity filters require as little as seven metres (25ft) vertical separation. Six hundred kHz spacing requires 30 metres (100 ft).

Many other options are now possible to eliminate de-sensing. Extra front-end tuned circuits and loaded cavity filters can be designed into the repeater. With 600kHz spacing, lumped tuned circuits and capacity loaded cavity filters have no effect - they are just not sharp enough.

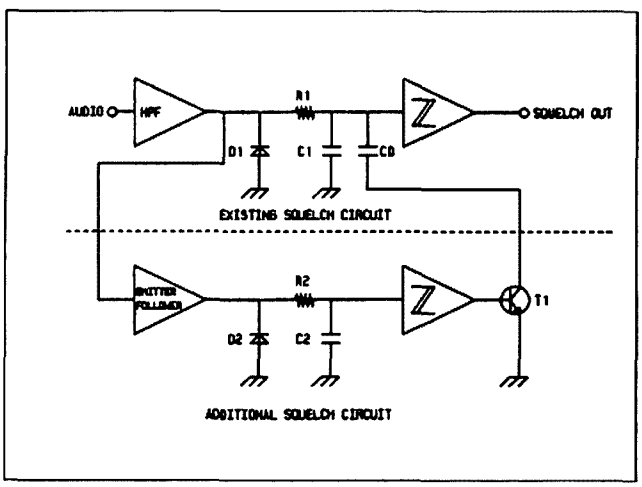
Rather than go on, the end result with 3MHz spacing for portable repeaters results in top performance in half the size and a third of the weight.

It is important to note that the 3MHz spacing is not for the existing repeater network, but an option for portable repeaters. Also there is no need to change portable 600kHz repeaters if they are working to their requirements.

Most synthesised (if not all) amateur transceivers have provision for odd ball splits. Even crystal bound rigs would only have to be equipped with one or two extra channels. An allocation in the 2m band for two 3MHz split repeater channels is all that is required.

VK6 tried via the WIA convention a few years back to have two such channels allocated for this purpose, but it was rejected. No reasons were given why the Federal Councillors rejected the idea; maybe it is time to try again.

ar



SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH – 52 CONNAUGHT CRES, WEST LAUNCESTON 7250

In the September column, I mentioned that Daylight Saving Time was going to be introduced on a common date throughout the country. Well, I'm afraid it was wishful thinking, for Tasmania went ahead and introduced it on Sunday 6 October, a full three weeks before the mainland states. It will also revert to Standard Time a full three weeks later, at the end of March 1991. At the time this was being compiled, Queensland was discussing the possibility of holding a referendum on Daylight Saving. Apparently there is some opposition to it from some quarters. Daylight Saving seems to work better in areas where there is a lengthy twilight period, eg in the southern states.

Events within the USSR have seemingly stabilised and I haven't noticed any alterations as yet. Deutsche Welle is going to commence utilising former jamming senders within the Soviet Far East to relay its Asian programming. I have no details at present, but you will hear the ID of the site at the commencement of its transmissions, eg "This is Deutsche Welle Caribbean Relay, Antigua" or "This is Deutsche Welle Relay, Trincomallee". The German sites are always identified in that language. I expect that an English ID will be inserted at the commencement of the transmissions from Soviet sites.

The higher frequencies are providing some useful signals in our late evenings from Europe on the short path and North America on its short path. The 13m broadcasting allocation is jammed full of signals around 1200 hours UTC. I also suggest you listen higher, especially on the new 25MHz marine allocation, where several CW markers from Europe and North America can be heard. The 11m broadcasting allocation still has a few signals. Deutsche Welle is on 25740kHz in German and Radio Norway International/Radio Denmark is on 25730kHz. The only other reliable signal on this band is Dubai on 25690kHz in Arabic.

The World Administrative Radio Conference (WARC) is being held early next year in Barcelona. This will be possibly the most important conference, from the perspective of radio amateurs and broadcasters. Hams do

face challenges to their allocations, particularly on VHF and on 7MHz. There are pressures for some of the VHF/UHF spectrum from commercial users, who would like to take them over. Broadcasters also have been putting pressure on WARC for increased allocations in recent years. Yet recent political changes in Eastern Europe and the USSR, plus financial cutbacks within several broadcasters, has slightly dampened pressures for increased space. This WARC is also likely to be less contentious than previous conferences, because the Cold War confrontation between East and West has ended.

Signals from an American religious station — WWCR in Nashville, Tennessee — are coming in well here. Although it is using 100kW, the signal is always well heard, because of the audio processing it uses. Recently they commenced using a second transmitter with separate programming. Although they primarily are broadcasting gospel programming, air time is also being hired by non-religious sponsors, eg travel companies, magazines etc. The primary sender is on 7520kHz from about 2300 till 1100Z, then 15690kHz between 1100 and 2300Z. The secondary sender is on 7420kHz+ - and 12120kHz + -. The station emphasises in its promos that it is on a clear channel.

Don't forget the broadcasters are going to make their alterations to their frequencies on the third of this month, to take account of propagational and seasonal alterations. This will be the last change for the year. The next alteration will be in March next year.

Well, that is all for this month. Until next time, the very best of listening and 73 — DE VK7RH. ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ - 7 CHURCH ST BRIGHT 3741

Pounding Brass

This year I was sincerely hoping to compete in the RD Contest, especially as I was sent a special computer program written for the RD Contest itself by Geoff VK3VR. The only problem was that I ran out of time and managed to work only the last hour of the contest. This was definitely not enough time to learn the right keys to operate the program, which actually does most of the work for you, including, among other things, sending "canned" replies.

Basically, the program requires that you tell it which mode you are working in, which band, and the station's callsign you are contacting. If you have set everything up properly, the program then checks the entered callsign for duplication, logs it against a QSO number, and sends that number to him. You then enter the number he sends you and the program logs it and replies with a sign-off "canned" reply. The program keeps track of the time and logs that as well, so there is no writing required at all, and no need to touch the key. All entries are logged direct to disk, so if there is a power failure or you switch off the computer for any reason, you can pick up exactly where you left off without losing any of your log.

At the end of the contest, another part of the program sorts everything out and prints a complete log including a front sheet or summary sheet. It is all very swish. Just make sure you get plenty of practice before the contest, as it is difficult to set things up during the contest if you are not happy with the way you have configured things.

Geoff has made his program available through Public Domain sources, which means you can get a copy almost anywhere. As with Gary Bold's Morse programs, I am prepared to distribute this one as well, **but**, owing to the increased costs of everything, I think $10 is more appropriate to cover disk, formatting, copying, packaging, postage and time. If you agree, phone or write to me with details of which format you want, (5.25" 360k or 1.2m floppy disk for IBM) and I will send you the program. If you don't agree then you can chase it up yourself! The same goes for Gary's Morse programs, of which I have sent out over 50 copies.

I have to admit that I have not given enough time to using a computer in the shack, so I am still not happy using one, although I am happy enough competing in the shorter "scrambles" run by the QRP Club, the next of which is scheduled for Thursday 14 November at 1000-1200 UTC on 80 metres from 3.501-3.529MHz. You just missed the 40m scramble on 15 October, but I only learned about that one just before writing this article. The previous 40m scramble was held on July and only eight logs were received. This is very disappointing, even for 40 metres, so if you decide to spend two hours of fun in the 80m scramble, don't forget to send in your log.

Rules: CW only, club members 5W max to ant, call CQ QRP TEST, scoring QRO VK one point, QRP VK five points, QRO DX five points, QRP DX 15 points. Further information is available from Ian Godsil VK3DID, 25 Monaco St, Parkdale, 3194. Send your logs to Ian too.

My only QRP rig is home-brewed for 80 metres so I modified my IC751A to operate down to five watts; it has a much better receiver (than anything!) so the mod is well worthwhile. Check your rig's manual, it's usually as easy as turning a trim-pot down while watching the meters.

QRP Club CW net for daylight saving time is 0830 UTC on Tuesday nights between 7031 and 7035kHz.

Other nets are:- SSB/QRO Thurs 1030Z 7080kHz

SSB/QRO Fri 0900Z 3620kHz (daylight saving)

SSBQRO Fri 1000Z 3620kHz (normal)

CW/QRP Tues 0945Z 3529kHz (non-daylight saving)

All QRP Club information is from *Lo-Key*"#31 The Journal of the CW Operators QRP Club.

Membership info from Kevin Zeitz, VK5AKZ, 41 Tobruk Ave, St Mary's 5042.

You may remember my reference to deaf people and the way in which Morse code could help them to communicate with others via radio.

Peter Phillips writes;

..... Regarding Morse for the totally deaf -

I recently made up one of Tom Moffat's VK7TM Listening Post II, Fax/RTTY/Morse decoders (page 80 *EA* January 1991). This unit comprises hardware/software to interface selected audio signals from a transceiver and display Fax/RTTY/Morse reception on an IBM PC screen. The front-end hardware of this device consists of an XR2211 PLL FSK decoder which locks on to the received audio and decodes FSK. Lock-on is indicated by an LED which also flashes on and off to follow received Morse. Hence, this is one proven method of reliably decoding Morse into a flashing light. It should be possible to extend the ability of the Listening Post to receive hand Morse with reasonable accuracy under moderate QRM/ORN conditions.

Incidentally, since transmitted Morse may also be displayed visually on the LED and PC screen by decoding of the transceiver's monitor tone, this device would be an excellent Morse practice/monitor aid for the totally deaf. In conclusion, I feel that a device such as the Listening Post II could be of great benefit for the totally deaf to receive Morse and achieve contacts in conjunction with the complementary pleasure of hand sending."

Any ideas in this vein will be be much appreciated.

I have heard that instead of signing 73s while working QRP the preferred option is 72s instead. The submission to use '72' to mean "Good QRPing" came from the G-QRP Club and was supported by the QRP CW Ops Club. Let's try it!

73 AND 72
GIL VK3CQ

Support the WIA in order to protect amateur radio frequencies at WARC-92

INTRUDER WATCH

GORDON LOVEDAY VK4KAL
AVIEMORE, RUBYVALE 4702

It is quite some time since the "motor-boat" station has been logged to any extent; however, it has cropped up on both 18.030 and 14.052.5MHz recently. The rate is about five pulses per second on the 14.052.5 frequency, the centre of two tones ... found only after using two filters! It is now believed to be a navigational station of the USSR; the .5 in frequency + 250Hz separation is a "giveaway" to the country of origin. But why use the amateur bands for this type of operation? Beats me! The filters required to split the signal being (1) using transceiver CW filter of 500Hz and audio filter (2) Remember when logging, this is mode P0N. It can also run at 26cps! Band condx for August have been fair to poor on 14 and 21MHz, 28 being swamped by **non-amateur stations** within our own country, by **illegal** use of cheap 28MHz amateur transceivers, readily available at present. We must **all** act to stamp this out; your DoTC is all ears.

ar

Date	Time U/TC	Frequency in MHz 'M' or 'E'	Callsign if Heard	Mode	RST	Logs X	Details of Traffic if Known and any Other Information
260891	1501	7004.8	-	A3E	S8	S	panish b/cast
140891 (VK6BGF)	1420	7010	R/pak	??	S9+		Radio Pakistan Islamabad
240891	1235	7018	-	J3E	S4		Asian b/cast 2-way tfc
250891	1232	7096	-	A3E	S4		B/c Islamic phrases recognised
090991	1232	7080	-	A3E	S5	2	B/caster music
080891	1047	14019	-	A3E	S4		Foreign language b/cast
210791	0650	14023.5	-	F1B	S4-5	75	250Hz with RYs USSR
210791	1200	14044+	-	Mxd	S4-6	61	Rad teleph duplex J3E 24hr stn
130891	1120+	14052	-	P0N	S6		OTHR "motor-boat" 26cps Nav Stn
2907	1110	14056	Several c/signs TR2A/HDZQ/4WPU/AWBO				
210791	mni	14058+	-	A2	S5-7	57	24hr/unstable freq to 14063
030891	mni	14070	VRQ	A1A	S9	17	Vietnam 5ltr code/+ VBX
030891	mni	14075	VRQ	A1A	S9+	54	Vietnam text
030891	mni	14080	VRQ	A1A	3		Also KFB on same freq
140891	mni	14095	VPC	A1A		17	NPO also on freq
050891	0930	14103+	NZB	A1A		10	ZBK de NZB QSV K
160891	0855	14140.5	UMS	mxd		4	Moscow naval radio USSR
210791	1150	14170.5	UMS	A1A		67	24hr stn USR ID in CW
310791	0755	14176	5PP	A1A		12	Also UID80
220791	0910	14211.5	-	F1B		34	2ch NOT F7B either ch 250Hz
300791	0905	14217.5	UMS	F1B		32	18hr stn USSR 60% tfc + A1A
070891	1216	18075		A3E		4	Ch B/c (or Viet) talk & music
250791	0400+	21115/20	CQ5	A1A		38	P7A is identical in ALL respects
050891	0740	21334.5		F1B		5	24hr stn located Europe 250Hz
210791	1150	21347.5		F1B		24	18hr stn. Target area not Pacific
240891	0800	21355	Rad Mosc	A3E	S9+	40	+F3 USSR spurii of 21505
030891	1127	28455		A3E	S7		B/cChin music & talk

28515/28575 Russian b/casters, also many P0N OTHR stations, also on 21MHz.
My thanks this month to VKs 4BG, 4OD, 4AKX, 4BHJ, 4BTW, 4BXC, 4EKA, 5TL, 6RO, 6XW and 6BGF. Late arrivals will be credited next month.

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. The information given below has been supplied to the WIA free of charge by Thornton Publishing. Your divisional library may have copies of the references quoted.

Antennas

ATUs

MFJ-948 'Deluxe Versa Tuner II' Antenna Tuner. (Product Review) Mark Wilson AA2Z, *QST* vol LXXV No 8 Aug 1991 pp 36 - 37. A report is given for this ATU, including some measurements.

Magnetic

Loop Antennas - Facts, Not Fiction (1). A J Henk G4XVF, *RadCom* vol 67 No 9 Sept 1991 pp 51 - 53. il ccts, diag and graphs. A detailed dissertation is given on the performance criteria of loop antennas used for transmitting and receiving. Methods of coupling are discussed, and the calculation of radiation resistance is considered in depth. An equation for radiation resistance of a loop is given:

$$R_r = 320\pi^4 \left(\frac{A}{\lambda^2}\right)^2 N^2 \text{ ohms}$$

where A equals the area of the loop in the same units as wavelength, and N is the number of turns in the loop.

Loop Antennas - Facts, Not Fiction (2). A J Henk G4XVF, *RadCom* vol 67 No 10 Oct 1991 pp 47 - 50. il graphs. A general discussion is given on the calculation of inductance, efficiency and capacitor voltage of single turn loops. The graphs shown simplify calculation. (See also p 30 and p 39 of the same issue for further discussion of magnetic loop antennas.)

Miscellaneous

AM/FM Car Radio Antenna. Ross Dannecker, *EA* vol 53 No 9 Sept 1991 p 66. il cct. A circuit is given which allows a Yagi VHF and a long wire MF antenna to be simultaneously connected to the input of a car radio, for household use.

RFD-1 and RFD-2: Resonant Feed-Line Dipoles. James E Taylor W2OZH, *QST* vol LXXV No 8 Aug 1991 pp 24 - 27. The outer conductor of the last quarter wave of the coax feeder is used as half of the dipole antenna. A multi-turn loop in the coax defines the end of its radiating portion. Resonance of the antenna can be achieved by winding cable on and off the loop, adjusting its position from the antenna end. A two band version can be applied by using a similar loop in the other antenna half at the higher frequency (RFD-2).

Multiband

All-Band Beam Antennas. Les Moxon G6XN, *RadCom* vol 67 No 8 Aug 1991 pp 49 - 53. il ccts, diags annd graphs. A detailed analysis is given of the multiband performance of quads and three geometric variants of the delta loop. The variation of radiation resistance and front to side ratio with frequency is considered in detail. Open wire feeders are advocated both for the driven element, and as a means of tuning the reflector from the shack. This arrangement allows the beam to be reversed, simplifying rotation problems.

VHF/UHF

Low Cost Discone Antenna. Phil Salas AD5X, *73* issue #371 Aug 1991 pp 24 and 26. il diags. A design is given for a discone antenna which covers from 144 to 1296 MHz. Welding rods are used as the conductors.

ATV

Ulna 23-24 GaAsFET Pre-amp. (Product Review) Mike Wooding G6IQM, *RadCom* vol 67 No 9 Sept 1991 pp 47 -48. il graphs. A description and test report of this ultra low noise pre-amplifier is given.

Audio

Rewinding Audio Coupling Transformers. Peter Lankshear, *EA* vol 53 No 9 Sept 1991 pp 86 - 89. A technique is described whereby audio transformers can be rewound for the restoration of vintage radios.

Speech Processor for Transceivers. Rob Evans, EA vol 53 No 9 Sept 1991 pp 72 - 77. il ccts, cmp, diag, graph, pcb and photos. A photocoupled LED/LDR combination is used to give compression of dynamic range. Illumination of another LED indicates that compression is taking place. A delay circuit on the PTT release enables a brief beep to sound, signifying the end of an over.

Computers

High Speed Data Acquisition. Mike Gray N8KDD, *73* issue #371 Aug 1991 pp 28 - 30. il cct, cmp, graph, pcb and photos. An A-D converter is described which reads digital equivalents of analogue inputs to the parallel port. Software is available from the author.

Universal CAT Interface. (CAT = Computer Accessed Transceiver.) Art Harding K5YEF, *73* issue #371 Aug 1991 pp 38, 40, 42 - 45. il ccts, graphs and photos. Several circuits are offered to gain computer control of a transceiver microprocessor. Communication is via the RS-232 serial port, and the TTL interface of the transceiver. A BASIC listing is included as a control program.

Using Your PC to Control Radio Gear (1). Tom Moffat VK3TM, *EA* vol 53 No 9 Sept 1991 pp 92 - 96. il Photos. The serial port connection of a computer to an Icom AR3000 receiver is described. Basic programs are included to provide control and readout functions.

Electronic Devices

An Infrared Keyer Interface. John Conklin WD0O, *QST* vol LXXV No 8 Aug 1991 pp 33 - 35. il ccts and photos. An infrared beam, modulated at 40 kHz, is used to key the transmitter as a substitute for the usual hard wiring.

Safe and Simple Helium-Neon Laser. Peter Phillips, *EA* vol 53 No 9 Sept 1991 pp 60 - 64. il ccts, cmp, pcb and photos. Design and construction details are given for a 0.8mW He-Ne laser. A laser engine with rotating mirrors for the production of special displays is also described.

Experimenting with Electronics (2) Flashing LEDs. Peter Murtach, *EA* vol 53 No 9 Sept 1991 p 97 - 99. il cct, cmp, pcb and photos. A description is given of an astable multivibrator which alternately flashes two LEDs.

Filters

An Audio CW Notch Filter for Home Brewing. Yoshiharu Mita JX1XEO, *QEX* No 115 Sept 1991 pp 4 - 7. il ccts, graphs and photos. The design of an audio filter is given which can be used either as a notch or peak filter. Notch depth is 55 dB. The Q for the notch may be adjusted from 4 to 14; the peaker has a fixed Q of 16. Optocoupled LEDs and CdS LDRs are used to control the resonant frequency.

Narrow Band Modes

The Kantronics KTU Telemetry Unit with Weathernode EPROM. (Product Review) Dick Goodman WA3USG, *73* issue #371 Aug 1991 pp 46 and 48. A commercial device is reviewed which is capable of sending remote weather data via packet. The equipment is available from Kantronics, 1202 E 23rd St, Lawrence KS 66046 USA. Prices are about $300 for the KTU, $110 for an anemometer and $90 for a rain gauge.

The TAPR METCON-1 Kit. (Product Review) Bill Brown WB8ELK, *73* issue #371 Aug 1991 pp 34 and 36. il photos. A kit is described which provides remote control or telemetry via packet. The kit is available from Tucson Amateur Packet Radio (TAPR), PO Box 12925, Tucson AZ 85732-2925 USA. Prices are around $85 for the main board, $25 for the V-to-F converter and $30 for the temperature board.

Pkt-GOLD Multimode. (Product Review) Marc Stern WA1R, *73* issue #371 Aug 1991 pp 20 and 22. il photos. The application of this software is reviewed. The program is available from InterFlex Systems Design Corp, PO Box 6418, Laguna Niguel CA 92607-6418 USA for around $60.

Poor Man's Packet. F Kevin Feeney WB2EMS and Andy Payne N8KEI, *73* issue #371 Aug 1991 pp 8, 10, 12 and 14. il cct, cmps, pcbs and photos. A simple modem interface is described that allows an IBM PC compatible to be used for simple packet without a TNC. The software substitutes for the normal TNC

functions; it is not described, but is available separately from the authors.

Power supplies

The Pulse Charger. Mike Bryce WB8VGE, *73* issue #371 Aug 1991 pp 52 - 53. il cct, cmp, pcb and photos. A 555 timer provides duty cycle charging, allowing time for cell cooling. The unit was designed primarily for use with Gel/Cell™ batteries, but may also be applied to NiCads.

First Steps in Home Construction (4). John Case GW4HWR, *RadCom* vol 67 No 8 Aug 1991 pp 41, 43. This section describes how to connect up and test the transformer. A discussion is given on the identification and testing of resistors and capacitors.

First Steps in Home Construction (5). John Case GW3HWR, *RadCom* vol 67 No 9 Sept 1991 pp 36 - 37. il cmp, diags, pcb and photos. This article gives the construction details for the printed circuit board used in this project.

First Steps in Home Construction (6). John Case GW3HWR, *RadCom* vol 67 No 10 Oct 1991 pp 42 - 44. il cct, diag and photo. The concluding article describes the finishing touches and testing of the power supply. A technique for fault finding is given.

12V Battery Regulator. Steve Garland, *EA* vol 53 No 9 Sept 1991 p 67. il cct. A Motorola MC34063 DC-DC converter is arranged to provide 12V output, independent of the state of charge of the source 12V battery. An output up to 60mA is obtained.

Receivers

SSB Receiver for the 80m Amateur Band (i). Leon Williams VK2DOB, *EA* vol 53 No 9 Sept 1991 pp 100 - 104. il ccts and photos. A receiver is described which uses 8 MHz cystal filter and varactor tuning. Maximum use is made of ICs, and the receiver tunes from 3.5 to 3.7 MHz.

Technology

EME

Measuring the Mass of the Earth: The Ultimate Moonbounce Experiment. H Paul Shuch N6TX, QEX No 115 Sept 1991 pp 8 - 10. Knowledge of the earths radius and the period of the moon's rotation about the earth, combined with measurement of the earth-moon distance, is sufficient information to calculate the mass of the earth. The result obtained was 6.037×10^{24} kg. This was derived from an echo time of 2.55 seconds.

Miscellaneous

Crystal Oven. Bob Parker, *EA* vol 53 No 9 Sept 1991 p 67. il cct and diag. A crystal and other components are housed inside a foam lined 35mm film canister. A BC178 thermally strapped to the crystal acts as a temperature sensor. A 56 resistor in contact with the crystal, provides heat.

Getting Started in Foxhunting. Manfred Zielinsky VE3ZIE, *QSTVE* Sept 1991 pp 3 - 4. il diag. A discussion is given on the techniques used for foxhunting. The guidelines within which such events are conducted are described.

Tuned FM Demodulators. Bryan Maher, *EA* vol 53 No 9 Sept 1991 pp 35 - 37. il cct and vector diags. A detailled analysis is given of the behaviour of the ratio detector and the Foster-Seeley circuit, with comparisons between both.

What Your Frequency Display Really Tells You. David Newkirk WJ1Z, *QST* vol LXXV No 8 Aug 1991 pp 28 - 32. il graphs. A dissertation of the bandwidth of various signals is given. The true meaning of frequency readout is discussed. The margins necessary to avoid exceeding the band limits are given.

Test Equipment

High-Resolution LF Adaptor for Counters. W Liu, *EA* vol 53 No 9 Sept 1991 p 66. il cct. A circuit is described which gives an exact hundred-fold multiple of the input frequency, allowing frequency counters to be used below their rated freqency.

Transceivers

Home Brew

A High-Performance Easy-to-Build 432 MHz Transverter (1). Ed Krome KA9LNV, *QST* vol LXXV No 8 Aug 1991 pp 19 - 23. il ccts and photos. 10mW output on 70cm is obtained from 1mW input at 28 MHz, with similar receiving conversion. MMIC chips are used in this design. It is designed for independent send and receive feedlines.

A Miniature 80 Metre SSB Transceiver (3). Mike Grierson G3TSO, *RadCom* vol 67 No 8 Aug 1991 pp 33 - 35. il ccts, cmp and pcb. This concluding part gives construction details and alignment procedure.

Sideband Can be Simple. Steve Price G4BWE, *RadCom* vol 67 No 9 Sept 1991 pp 41 - 45. il ccts and photo. A general dissertation on the design philosophy for simple mono band SSB rigs is given, together with a specific design for a 7 MHz 5W transceiver. Scaling factors can be used for application to other bands.

Product Reviews

Icom's IC-24AT: A 'Technical' Review. Lew Whitbourn VK2ZIP, *EA* vol 53 No 9 Sept 1991 pp 82 - 85, 89. il graphs. A review of this 2m/70cm transceiver is given including measurements.

TS-850S Kenwood HF Transceiver. Peter Hart G3SJX, *RadCom* vol 67 No 10 October 1991 pp 35 - 37. il graphs and photos. An evaluation is given, complete with measurements, for this transceiver.

Glossary of Abbreviations

il The article contains illustrations, a list of which follows.
cct A circuit diagram
cmp A component layout drawing
EA *Electronics Australia*
diag A mechanical drawing
pcb A master drawing from which printed circuits may be produced
QSTVE *QST Canada*
RadCom *Radio Communication*
RadZS *Radio ZS*
73 *73 Amateur Radio Today*

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DIVISIONAL NOTES

VK2 NOTES

TIM MILLS VK2ZTM

Broadcasts

A reminder to those who submit copy to the Divisional broadcasts. Deadline is 6pm Friday by all methods. Mail to PO Box 1066, Parramatta 2124 in time for Friday collection; fax to (02) 633 1525; packet via VK2RWI on 4850. When preparing copy, use an A4 format, wide margin on the left and double spaced. Write in the third person. If the item is for more than one week, provide additional copy which should differ slightly. While you may like the same thing repeated, it loses its impact if the listener keeps hearing the same thing. Please consider the broadcast officer who has to put it all together, and make his life easy.

The final live broadcast for the year will be on 22 December and resumes on 12 January 1992. VK2WI will, however, be on air during the break with a recorded segment.

The new antennas have been installed on the 23cm repeater at Dural. A donation from the Dick Smith Electronics organisation, which has been very supportive to this repeater project with its previous donations. The present tower at Dural has become quite an antenna farm, with many antennas being raised to try to see over the tree line. Perhaps we should take to watering it to make it grow, unless we can get the trees to stop growing. Tree height has reached 20 metres and leaves only 10 metres of the tower in the clear.

Divisional

There will be no increase in the Divisional component of the 1992 membership fee, Divisional Council decided at the September meeting. It is pleasing to see a steady intake of new members throughout the years, and the retention rate of membership has been

good in these difficult times.

The next and final Trash and Treasure for the year will be on Sunday afternoon 24 November. A list of items has recently been compiled and may be obtained by sending a stamped addressed envelope to the office. Included in the list are some further "grab bags", Mocom 70s — a UHF two-way which has a PA stage which can be used on 2m. There are a few roller inductors which might suit that tuner project (limit two). Also, ask for a Bookshop list.

Happenings

The Gladesville/AUSSAT test was not conducted in September, as the transponder was not available for the time slot. There is a firm booking, however, for the end of this month, the 27th. Reminders via Divisional broadcasts... Gosford field day is getting near — February 1992 — those requiring stall/table space should lodge request with the Field Committee ASAP ... Advise any Callbook corrections, including repeater listing, to the Divisional office.

New Members

The following recently joined the VK2 Division, and a warm welcome is extended to them.

B C	Andrews	VK2MFT	Grafton
R W	Arnold	Assoc	Gymea
R M	Berrel	VK2XRB	Springwood
J P	Bray	Assoc	Narromine
B E P	Gammage	VK2JBG	Fairfield Heights
H	Gause	VK2MTV	Barnsley
M	Hazell	Assoc	Narraweena
R M	Hynes	VK2GHB	Avalon Beach
W S	Johnstone	Assoc	Strathfield
V D	Lane	VK2VLD	Epping
L A	McKenzie	VK2ZLU	New Lambton
M	Mihailovic	VK2AZH	Smithfield
A	Pollock	VK2FZ	Bondi Junction

HF Predictions

We regret the temporary absence of this feature

5/8 WAVE

ROWLAND BRUCE VK5OU

Where does all the time go to? I've just arrived back in Adelaide from a conference in Sydney, and less than a week later I'm about to leave for Melbourne en route to another conference. My October *AR* arrives and I see I have missed the deadline. The fact that you are reading this, assuming indeed that it is here TO read, and being here, someone is bothering to read it, means the deadline has been extended. Sounds rather like the philosophical discussion on "How can you prove you exist?" Cogito ergo sum. Good, that has filled some space. Hurry back to your typewriter, Jenny, all is waiting for you.

Work prevented me from attending the September meeting, but I am assured there was an excellent presentation on JOTA and the Aussat link. Thank you Trevor Quick VK5ATQ, Bruce Mayberry and Peter Koen.

And that is a crafty way of getting into a new subject. Peter Koen is one of those who was successful in the recent batch of exams. Congratulations to the following achievers: (R=Regs. A=AOCP, N=NAOCP, 10R 10S 5R 5S = Morse rec/send)

Brian Barrow (R, 10R, 5R, 5S), Peter Burke (R,A,N), Robert Burns (5R), Peter Cockburn (A), Roy Cummings (R, N, 5R, 5S), Mark George (R,A), John Highman (R), David Hunt (R), Peter Koen (N), Lee McDonald (R,A), Ben Benge (10R), Edward Mertens (10R, 10S, 5R), Darin Roberts (R,A), Antonius van Lysdonk (A), Leonardus Vette (10R, 10S), William Vogel (A, 10S), Brenton Vowles (10R) and Dean Whitehorn (R,A,N). The high pass rate in the theory papers reflects, I believe, the excellence of our tutors. Well done!

Finally, an advance notice of the Christmas get-together which will be held in the Woodville Community Hall, Woodville on Tuesday 10 December. An evening to come with your XYL/OM and chat, celebrate and, I hope, hear an interesting speaker. Details are not finished, but if Peter VK5PRM is able to deliver the man we want, it will be a talk not to be missed.

VK6 NOTES

HARRY ATKINSON VK6WZ

Officials responsible for the West Australian section of Rally Australia were full of praise for the work of WICEN volunteer operators. During the four-day, 2000km event, radio operators from car clubs, the State Emergency Service and forestry authorities, plus WICEN members, used something like 200 transceivers on HF, VHF and UHF, on the ground, at race headquarters, in vehicles — even aircraft mobile. FM, SSB and packet modes were utilised in a total of eight distinct systems. These catered for command, stage safety, results, special services, spectator and media information requirements.

Packet, first introduced in the 1990 Rally Australia by WICEN, was again used — this year covering 10 stages as against the two last year.

European car crews competing for the first time were astonished that the radio communication system consistently got stage results to headquarters within one minute and a new printout from the computer within three minutes. Those crews who were old hands at the game had been aware in past years of the speed of the system — it was first introduced four years ago. The highlight for competitors was the fax of the printout available at a field results station 5km down the track waiting for each crew to seize on the way out!

Graham Byass, a race official and holder of the call VK6BY, and therefore "with a foot in both camps" went public with commendation of WICEN's part in the very complicated but extremely efficient communications system.

By the time you read these notes, special events stations marking two important occasions, the fourth Gladesville test, the VK-ZL-Oceania 'test, a QRP CW exercise and JOTA will all be behind us; October certainly was a busy month! By now, also, the NCRG's popular Hamfest will have come and gone (3 November) and doubtless will have been the success the hard-working northern corridor lads and lasses richly deserve.

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CLUB CORNER

The Mackay Amateur Radio Association Inc

We advise current information re the Mackay Amateur Radio Association Inc (previously the Mackay Amateur Radio Club).

Meetings — activities evening first Friday each month, 1930K at the SES Building, Swain St, North Mackay.

Club Net — VK4WIM/P Friday 2000K, 147000 repeater. Eighty-metre net has been suspended for some time, but may be reintroduced later in 1991.

Club Repeaters — 2m

Voice	—	VK4RMK	tx	147000	HASL 320m ERP 25W
			rx	146400	Good coverage Mackay area
Packet	—	VK4RMK		144900	Same locn/pwr as voice rpt
Packet	—	VK4RZM		144900	Loc 30km ENE of Nebo HSAL 800m ERP 25W (links Mackay/Central Highlands, thence Rockhampton and south)
		70cm			
Voice	—	VK4RMU	tx	438125	HASL 40m ERP 75W
			rx	433425	H Pol beaming nth/sth from Andergrove (North Mackay)

WARWICK LAKE VK4AP

(TREASURER, FOR SECRETARY) PO BOX 1065 MACKAY 4740 ar

QSLs from the WIA Collection

KEN MATCHETT VK3TL HON CURATOR, WIA QSL COLLECTION
4 SUNRISE HILL ROAD, MONTROSE 3765. PH: 728 5350

Zimbabwe — Formerly Southern Rhodesia

Bounded by Zambia (formerly Northern Rhodesia) to the north, Mozambique to the east, by South Africa to the south and Botswana to the west, this land-locked country has an area of about 400,000 sq km or roughly half the area of NSW. The country lies on a gigantic plateau of central South Africa and is noted for its wildlife and scenery. The name Zimbabwe is actually the place name of a site of massive ruins of a former civilisation dating back to the third century. It is said that Zimbabwe inspired the author, Rider Haggard to write some of his adventure books based on lost treasures of the area.

The white population is outnumbered about 20 to 1 by the indigenous peoples. These are the Mashona and the Matabele, who are the descendants of the early civilisation that built the impressive archeological buildings "Great Zimbabwe". In 1837 the Mashona (who were mainly a pastoral community) were conquered by the army of the Matabele, a warlike Zulu group. They established a military despotism but were eventually conquered in 1893 by emissaries of Cecil Rhodes, the most powerful man in Africa. His many bequests include the Rhodes scholarships. Three years later in 1896 Mashonaland (as the country was then called) was renamed Rhodesia after Rhodes.

Southern Rhodesia became a country in its own right in 1911 when the territory was divided into Southern Rhodesia and Northern Rhodesia. A government was established in 1923 and although technically a colony, Southern Rhodesia was to all intents and purposes a dominion which enjoyed virtual self-government by its white minority.

3SR

This early Rhodesian QSL was received by that remarkable DXer Alan Hutchings of Callawadda, Victoria, who held the call OA3HL. The earliest QSL cards from about 1924 to 1927 did not carry any prefixes. The Rhodesian 3SR card is such an example. Operators were obliged to indicate the name of their country as well as giving their callsign, since 3SR could be a station in Rhodesia or any other country. The card is dated for a QSO in November 1927. Actually, from 1 February 1927 a new system of station callsigns came into practice but some stations, like Rhodesia 3SR, were a little tardy in adapting to the change. The Australian station OA3HL did conform. This new system introduced what were to become known as "intermediates". These consisted of two letters, the first one indicating the continent, the second, the particular country. For example, Australian stations carried the intermediate OA (O=Oceania, A=Australia), The Rhodesian station should have used FO (F=Africa. O=Union of South Africa, Northern and Southern Rhodesia, Bechuanaland and South West Africa). Why the name "Intermediate"? An earlier development in calling procedure was to join two stations (the station called and the station calling) with a code which indicated the continent and the country, e.g. OA, FO. Thus if Rhodesia was calling Australia, the call would be 3HL oafo 3SR, the code "oafo" (written originally in lower case) being called the "intermediate" since it joined the calls of the two stations. Later the intermediate became an integral part of the call itself eg OA3HL, the new intermediate then becoming the word "de" (from) eg OA3HL de FO3SR.

The old Rhodesian 3SR card gives the signal report as QRK R5 with CW note of DC quality (ie no ripples or modulation). The QRK stood for "How do you receive me?" or "I receive you ..." The Rhodesian station's oscillator was the very popular Hartley circuit LC (loosely coupled).

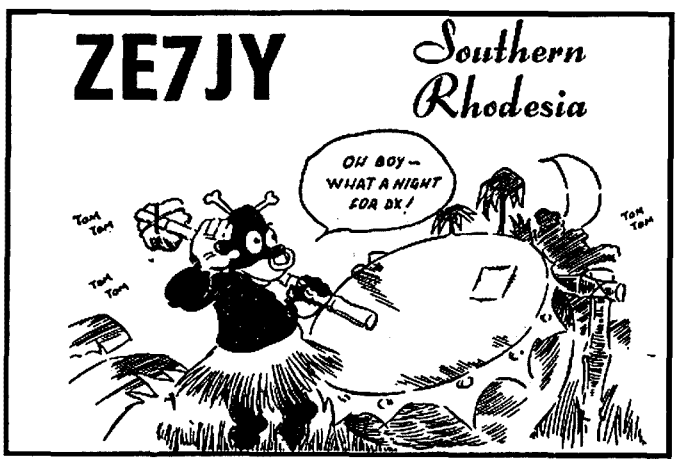
ZE7JY

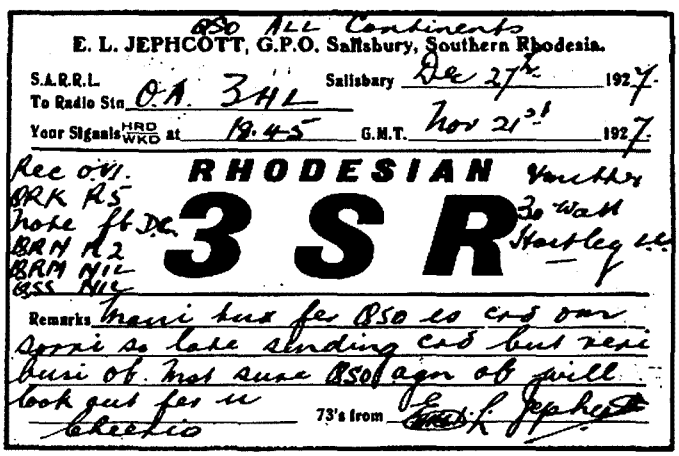
From 1 January 1929 new prefixes were allocated to all countries which were previously using intermediates. Northern Rhodesia was allocated VQ but Southern Rhodesia did not appear in early country listings. Readers should not wonder at such omissions. The period of the late 1920s and early 1930s saw a great number of changes and alterations to allocated call prefixes and it was not until the mid 1930s that the situation settled down to some semblance of order. The ZE7JY card was received by SWL Eric Trebilcock (now an SK) from an XYL operator, Mrs Marjorie Shepard for a transmission dated October 1957. The QTH was Salisbury, the capital city. The ZE prefix was derived initially from the prefix block ZBA-ZHZ assigned to "British colonies and protectorates" set down in the 1930 edition of the *Radio Amateur's Handbook*. It first appeared in country listings in 1932 as ZE1.

Z27JAM

Pressure from the black majority for recognition increased rapidly after the end of World War II, but there was strong resistance from the right-wing-dominated government whose attitude towards the indigenous peoples was little more than paternal. The white population also wanted a greater degree of independence from Great Britain, the situation coming to a head in November 1965, when the new Premier, Ian Smith declared independence unilaterally. Hoping for a fall in the Smith regime, Britain imposed a total embargo on trade with Rhodesia a month or so after this Declaration. The British PM at the time, Harold Wilson, dismissed the proposal to use force, although many African states supported the move, principally because there was no guarantee of black majority rule. There followed a long period of internal strife, independence finally coming on 18 April 1980 under PM Robert Mugabe.

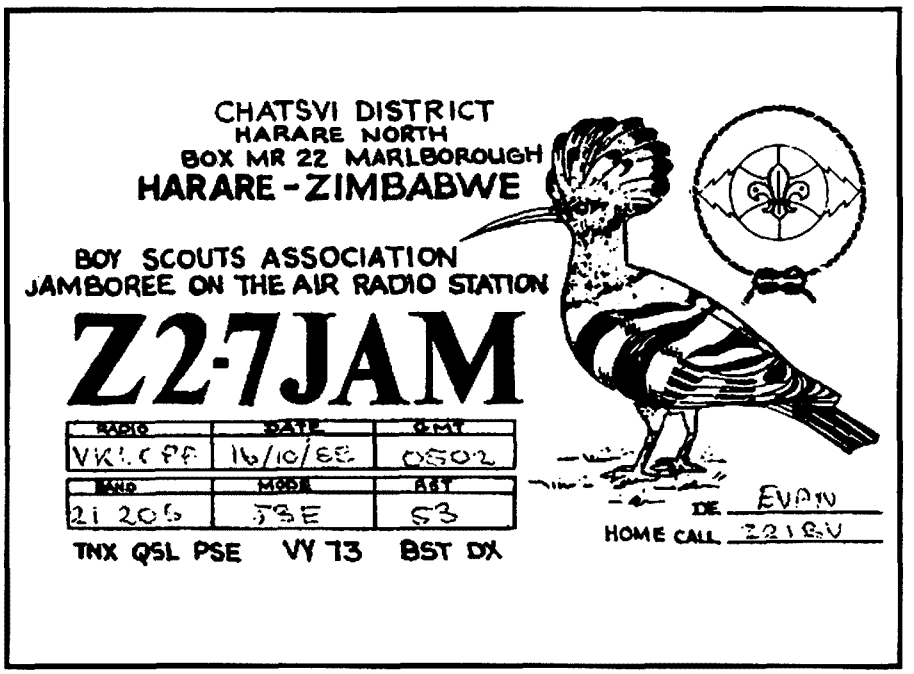
The name Zimbabwe for the country dates from 1979, and this started to replace the name Rhodesia in country listings and QSL cards in 1980, but the ZE prefix remained. The present Z2 prefix (from the ITU-allocated





block of ZZA-ZZZ) started to appear in DX lists in 1982. The Z27JAM card shown is a specially allocated call for the occasion of the 1988 JOTA. (See AR Jan and Feb 1991 for a description of the Boy Scout Movement through QSL cards). The QSL showing the "Zimbabwe Bird" emanates from Harare which was formerly Salisbury. This was one of many changes in place names since independence, the name Harare dating from April 1982.

After more than a decade during which anarchy was predicted in the transfer of power from the white minority to the black majority, Zimbabwe has experienced quite a peaceful transition period, especially since 1988. The former landholders remain owners of much of the country's wealth which includes vast mineral deposits. The country is also opening up to tourism. There are several national wildlife parks and reserves and, of course the famous Victoria Falls, the largest waterfall in the world, situated in the far west of the country on the Zambesi River. Several Australians have "discovered" the country in recent years, particularly since the introduction of direct flights to Harare from Australia through Qantas and Air Zimbabwe. **ar**



OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

European Appreciation

I enclose a copy of a letter which arrived a few weeks ago by surface mail from the Hungarian Radio Amateur Society.

It is good to see our magazine is appreciated in other parts of the world.

STEPHEN PALL VK2PS
DX EDITOR OF *AMATEUR RADIO*

Dear Steve,

We have been very pleased when we read your excellent article on amateur radio in Hungary (May *AR* p24). We would like to express our sincere thanks for giving a realistic picture of our Society.

If you or any members of the WIA should visit Budapest, don't hesitate to pay a visit to our headquarters to establish personal contacts.
Bela Berzsenyi HA5EB
President of MRASZ

Cultured, but Codeless

I hope somebody tells VK3MEY (*AR* Sept 91 p56) that there are many people on the amateur bands without the code, eg "Limited Calls". Are we to be lumped in with his so-called "yahoos"?

If he bothered to read the regs he would know CW is only required to work 160 to 10 metres.

Perhaps he thinks all packet and RTTY operators should do a typing test?

DARYL QUIRK VK3XDQ
PO Box 78
NEWSTEAD 3462

Compulsion?

It is interesting to browse through past issues and compare those with the present. Doing that recently I found the following words of wisdom in a 1986 editorial:

"There are some countries where you cannot get an amateur licence until you have joined the amateur society. The society may even exam for, and award, the licence. Membership in those countries really is compulsory."

Also in the same editorial:

"Our Australian tradition ... has prevailed for many years over some who might favour compulsory membership."

Now that the federal WIA has the responsibility of preparing examinations and providing results information I wonder — is compulsion far off, and will tradition again intervene?

The relevant traditions are: freedom of choice, people government through representatives or direct or both, and opposition to "representatives" who seek to develop their role as a power base.

LINDSAY LAWLESS VK3ANJ
BOX 112 LAKES ENTRANCE 3909

Strange Facts?

Ref: *Amateur Radio* Sept 91, p47.

Further to Gil's definitions: an ohmmeter is one who eats ohms.

A Farad is a high Egyptian official, while a microfarad is an Egyptian public servant. (Pharaoh??)

A vacuum pump pumps nothing; a vacuum container contains nothing; and a vacuum tube conveys nothing from the container to the pump.

Finally, tools are pieces of soft iron stamped out by humorists.

GEORGE TROTTER VK2AVY
568 BUCKHORN ST
LAVINGTON 2641

Straightening Record

Reference the letter in Sept '91 (Memories of the War, p56), my father was delighted to see it in print, but pointed out that I had made a few errors in writing it without his knowledge.

Firstly, his jungle action was in Bougainville, not New Guinea. Secondly, the submarines involved were "Gato" and "Garfish", but not "Swordfish", although the latter was also active in the area.

We received a very nice letter from Rob VK5RG with reminiscences of the effort involved in getting one "portable" radio into the field. The AWA-made 3BZ transmitter/receiver/power supply, plus generator, batteries, fuel and other supplies (sometimes including food!) needed at least 14 soldiers to carry them all. Later, with the smaller and lighter 108 and 208 radios, smaller groups were possible.

One communication story was about a force of some 80 Japanese bombers flying over Bou-

gainville.

There was no time to encode a message, and Dad's colleague Ron ("Percy") Cream sent a brief plain-language report, which was heard by an SWL in Perth, passed on to the Army and thence to the USAAF in Guadalcanal (Solomon Is) in time for the American fighters to take off and tackle the bombers.

All in all, Dad was "tickled pink" to see his story in print (*and will be again, I imagine! Ed*). Thanks also to Horrie VK2AMZ for his "Krait" story in January.

MAURICE STONEHOUSE VK6NST
140 MEDINA AVE
MEDINA 6167

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS.

We regret to announce the recent passing of:

Mr	CC	Carr	VK1DJ
Mr	R	Whitaker	VK3JS
Mr	G	Harvey	VK3CYA
Mr	J	McDonald	VK4CS
Mr	B	Underwood	VK5NMS
Mr	L	Arnold	VK7AM.

Les Arnold VK7AM

It is with deep regret that I have to record the passing of Les VK7AM on 10 September 1991, aged 78 years.

Les was among the early amateurs, having received his licence in 1934, and was active on all bands.

He was one of the founding members of the northern branch of the Tasmanian Division WIA, and was a meticulous constructor and operator.

During WWII Les was engaged in munitions work and, after we received our gear back, continued in his amateur interests.

Over more recent years Les was less active, having developed a great passion for his golf game and fishing interests, but amateur radio still played a part in his lifestyle.

A gentleman, Les will be missed by his many friends, and to his widow we extend our sincere sympathy.

RAY KILBY VK7RK

Robert Wilkins VK5AUR

Robert passed away on 5 August 1991 suddenly at his home at Callington, South Australia. Robert had a long battle with cancer over many years. The cancer went into remission and life looked good. But, in the end, it was his heart which gave out. Robert was 42 years old.

He was educated at Scotch College in Melbourne. Robert then completed training as a television technician with the ABC.

Robert was first licensed as VK3ZPX in 1965. He upgraded to VK3AUR. VK8RW and VK5AUR followed.

Always active, Robert had many interests and enjoyed life to the full. Many will remember VK3AUR on six metres in the late 1960s. Later, Robert was very interested in computers.

Robert worked in TV, radio, electronics and computers over many years. Lately Robert had been active on packet radio.

Robert will be sadly missed by the many friends and fellow amateurs who knew him.

To his mother Helen, sister Libby and her family, sons Troy and Justin, to his wife Mary and to Barbara we extend our sympathy.

GIL SONES VK3AUI

Rod Whitaker VK3JS

Rod passed away on 21 September 1991 just after his 52nd birthday, after a year-long battle with cancer. Although a low-profile person, he will be remembered by many. Rod was brought up in Sandringham where he went to school. After training in television at RMIT he joined HSV7, where he worked for 22 years from 1968. Rod married Judy and moved to Dingley, where they raised two fine sons.

One of Rod's highlights was going to Montreal in Canada to cover the Olympic Games for the Seven Network. After rising to be Supervising Technician in Charge of Videotape, Rod felt it was time for a change, and moved to Haileybury College in the audio/visual field.

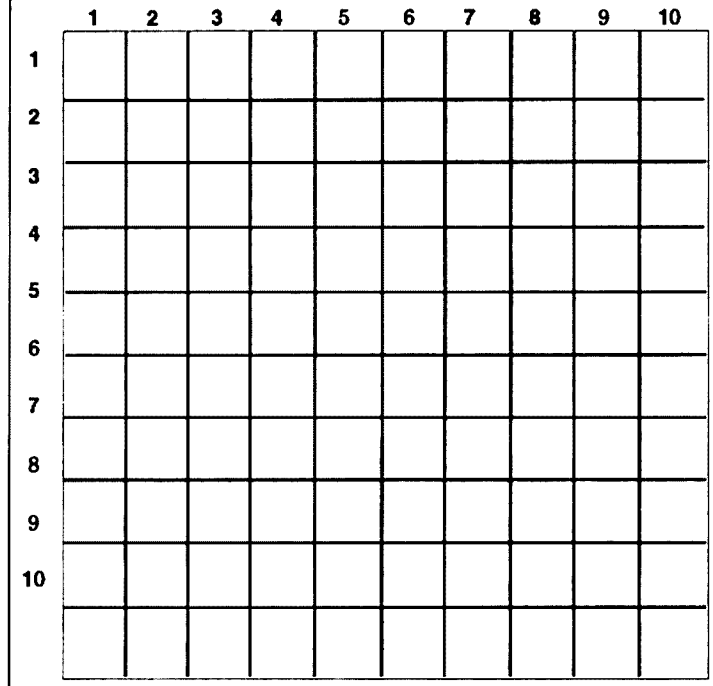
Rod was first licensed as VK3ZIW, and was very active in VHF activities for many years. He then obtained his full call and became an active DXer while still keeping an interest in VHF. His shack in Dingley was always a meeting place for those who knew him, and a number of amateurs had their introduction to radio through Rod. He was a member of the WIA and formerly the MDRC.

His other interests were cycling, windsurfing and computers. Rod will be sadly missed by his wife Judy, his sons Darren and Andrew, as well as his many friends.

KEN JEWELL VK3AKK

Morseword No 56

Solution Page 56



Across:
1 Keen
2 Harvest
3 Darkens
4 Hearing is one
5 Not right
6 Terror
7 Tack
8 Over
9 Errors
10 Parts

Down:
1 Fingered
2 Attack
3 Naked
4 Feeder
5 Ocean movements
6 Quick glance
7 Go without food
8 Leases
9 Jeer
10 Secure

Audrey Ryan 1991

HAMADS

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● LOGMASTER: Radio logkeeping software $89. CODEMASTER Morse training/proficiency software $39.95 endorsed by Officers of Signals Schools of Aust Army, both products include manuals for IBM/clones PC, XT, AT. Information Order. Milestone Technologies P/L PO Box 699 Ml Waverley, Victoria, Australia 3149. phone (03) 607 6767. 8 Greenham Cres, Mt Waverley 3149.

● RELIABLE PSU KITS 20A @ 13.8V fixed or variable 8-15V, 25A & 30A transformers available. Features over voltage protection, fixed over current protection, short circuit protection. Mains born spike protection. CW/RTTY filter kits. Three switchable bandwidths 180/110/80Hz at centre frequency 750Hz steep skirt a feature. Full details available from Moorabbin & District Radio Club, PO Box 88, East Benlleigh 3165.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 is a high-resolution short-wave weatherfax, morse & RTTY receiving program. Needs CGA, SSBhf radio & Radfax decoder. Also RF2HERC, RF2EGA & RF2VGA, same as RADFAX2, but suitable for Hercules, EGA and VGA cards respectively, $35. SATFAX is a NOAA, Meteor and GMS weather satellite picture receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, and Weatherfax PC card, & 137MHz receiver, $45. All programs are on 5.25" or 3.5" disks (state which) and documentation. Add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm, Old 4005. Ph: (07) 358 2785.

FOR SALE — ACT

● YAESU FT730 70cm FM transceiver, EC with mic u/dash mount & handbook, $380. YAESU FT102 HF transceiver, FM board fitted and with hand & desk mic. GC. $880. Richard VK1RJ (06) 258 1228.

FOR SALE — NSW

● TELEQUIPMENT D43 CRO $120, Sanwa SO-108 RF signal generator 150kHz-300MHz, $55. Gossen Megger (mechanical) unused, $40. New Octal and miniature valves. SASE for list. VK2WS QTHR (067) 75 2158.

● ICOM IC24-AT. Nice little dual band handheld, but not as good as the one that replaced it. Ser No 13793. $650 ono. Phil VK2TPH (042) 61 3666.

● SWEEP OSCILLATOR KAY 860. Sweeps from 2MHz to 220MHz in 12 bands, $220. Hewlett Packard sweep, model 8690A, from 1.8GHz to 4.2GHz, $2400. Peter VK2CPK QTHR (02) 411 1227.

● NEW AND USED low voltage high current power supply TFRs and parts, heatsinks and cases. Country freight no problem. Cheap prices. Fred VK2YZU QTHR (02) 869 8989.

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● IC730 HF txcvr, VGC. 10-80m w/mic & manual, S/N 12640, $750. Kevin VK3CKL QTHR (03) 792 9503.

● RACAL COMMUNICATION RECEIVER RA17L with manual, VGC, $600. (052) 48 1410 AH.

● SONY MSX micro floppy disk unit HBD50, compatible with PX7 Pioneer computer, $150 ono. VK3BAX QTHR (052) 29 7401.

● YAESU FT101B, VGC, Mic, manual and leads. Sell to licensed ham only. $450 ono. VK3AXT QTHR (054) 39 5038.

● PK87 TNC, works well, $150. Andy VK3DTO (053) 82 1439 or (053) 82 1759.

FOR SALE — OLD

● 433MHz S/STATE LINEAR amp, 10W in 40W out, $45. G4ENA fast scan to slow scan converter, needs interconnections between panel & completed PCBs, $140; Sig gen Heathkit RF1U, $25; tester for FETs, $25; ATV txvr 70cm, $95; Invertor 12V DC to 270V DC, $10. Carriage extra large items. Norm (077) 79 4641.

FOR SALE — SA

● FRG7 receiver. FM320 power supply; vertical ant AVT ant, 27m 23-channel txcvr SM 220 monitor, SP930 speaker, SP40 mobile power supply, 12V/2 amps. "Offers". VK5AUS QTHR (08) 344 5011.

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FOR SALE — WA

● LINEAR AMP FL2100-Z S/N 16070130. Serviced and tested, VGC, orig carton & operating manual, $800. George VK6GF QTHR (09) 450 5222.

● ICOM IC730 with desk mike, service manual, $700 ono. (09) 535 7178.

FOR SALE — TAS

● ICOM 1271A all-mode 23cm tx/rx, ser no 1339, in PC, with built-in PSU PS-25, mike, manual & box, $1500 ono. Will consider swap for HF rig, linear or test equip. Frank VK7LO QTHR (004) 33 3231.

WANTED — ACT

● WANTED: Engraved panels and/or metalwork for Electronics Australia, Deltahet or 240 communications receivers. Also Eddystone 898 dial drive. J Weaver, PO Box 396, Woden ACT 2606.

WANTED — NSW

● µA78Hg Voltage Regulator. VK2FV QTHR (02) 449 4950.

● CIRCUIT OR DIAGRAM for handheld Yaesu FT202. All costs paid. Bruno VK2BPO QTHR (02) 713 1831.

● KENWOOD SP230. Garnet VK2CGF QTHR (065) 51 0767.

WANTED — VIC

● TRANSFORMER 240V primary 100V 3-4 amp secondary. Urgent! Can anybody help? Denis VK3CUI (03) 874 6517.

WANTED — QLD

● CAN ANYONE HELP? Need manual & circuit for SS.105.S Shimuzu Denshi. Will pay costs. Sandro VK4KSB, ex VK4NSB QTHR.

● EX-PMG Telecom Tress reperf or Murray Multiplex gear. Stan VK4BSD QTHR (072) 67 6666.

● MANUAL FOR ZENITH LAPTOP computer model 181 or similar or borrow to copy. Will meet all costs. Bill VK4BIL QTHR (07) 263 2630.

● CIRCUIT & DETAILS AWA Skyphone type VC-10-D VHF, 10-channel. Reply to Freepost No 4, A G Loveday, Rubyvale Old 4702. (079) 85 4168.

● WANT TO RESTORE army mine detector (Aust No 2 Mk 3 1953 with broken search cable and valves missing. Would like copy of manual and circuit. VK4EF, 97 Jubilee Tce, Bardon 4065. (07) 366 1803.

● HERVEY BAY ARC looking for info circuit, also modem suitable to get Sagem TX20 onto HF RTTY. Box 526, Hervey Bay 4655.

WANTED — SA

● COAX SWITCH. Linear amplifier tubes (various), cheap HF txcvr, HF antenna, 6m gear for CW operation. Details to "Doc" c/- VK5BWR, Box 444, Whyalla 5600.

● HELP WITH CONV of Expo Bushranger 27MHz CB to 20m. Is it possible? Any ideas appreciated. Alan VK5BWG QTHR.

WANTED — WA

● VALVES — 6BJ5, EBF35M. Ceramic valve base for QB3/300. Write, phone or despatch to Ken Gillon, 5 Hillegine Crt, Gosnells 6110. (09) 398 7829.

STOLEN EQUIPMENT

Stolen from C S Fisher VK2CFC, 18 Langdale Ave, Revesby: FT-757GX HF transceiver S/N 4J 121 785; FC-707 Antenna tuner S/N 1L 170 086; PF-707 Power supply S/N 1L 150 596.

Recently a YAESU FT23R was stolen from the Box Hill branch of Dick Smith Electronics. The serial number is OD071763.

Stolen equipment from Alan VK2DQP, 80 Lorraine St, Peakhurst 2210: FT101E transceiver, S/N 8J361432; Kenwood MC50 Microphone; Kenwood LF30A lowpass filter; Daiwa CN620A SWR/power meter; home brew antenna tuning unit; home brew electronic Morse keyer; Vibroplex Morse key; Dick Smith T2000 soldering station. Please contact Riverwood Police on (02) 584 1899.

MORSE COURSE

EVAN JARMAN VK3ANI

Morse code simulators are in the public domain, usually the result of an amateur writing some code so the home computer can be used for a little receiving practice.

Having seen a few, I was surprised to see a commercially written simulator appear. However, this is a well written simulator, with a number of features that others have found too difficult to incorporate.

For those who are unaware, a Morse code simulator usually uses the internal speaker of a computer to transmit Morse code and then displays the code sent on the screen for verification. The only thing it is told is the speed at which to send. This allows the operator to improve his receiving skills.

"Morse Course" does this and more. It has been written to give a display that takes advantage of the screen available and is comparable with any other software available. The true beauty of Morse Course is that it allows the operator to program as many options as required.

The menu allows selection of the characters to be sent, the speed, even the tone of the signal. For those learning Morse, there is a complete set of lessons. The option that really pleased me was the simulator where you have to respond with particular codes to what is sent. Yes, Morse Course also listens to your fist, but more on this later.

An option that will please many contemplating the Morse examination is the simulator's ability to send any text you nominate. The text is loaded with any text editor (eg Edlin XT Gold etc) and then called from the menu of Morse Course.

I loaded some of the old examination texts, set the tone and proved to my satisfaction that Morse Course could be used to simulate any examination requirement. It may be a thought for those involved in the examination devolvement.

Morse Course could also be used to practise sending. Although the manual specifies using the shift key or mouse button, I made a small mouse extension cable with a key parallel with the mouse button. You need the mouse for start up, as the computer will look for it when the mouse-cum-program executes. This is far better than the technique recommended in the manual which was the only part I would not agree with.

Sending practice is possible with Morse Course with two options available. One gave a list of characters to send and then showed graphically how the quality of transmission was. This can be used to improve quality, for it is quite objective. A set of lessons for those wanting to learn Morse code is included with an itinerary so that what is learned is not rushed.

Morse Course comes as a disk and manual. The disk carries a user registration embedded in the code. It is easily the best Morse code simulator I've seen.

Our copy came from Goodhand Technologies and was an IBM-compatible format. See advert P 25. ar

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Solution to Morseword No 56
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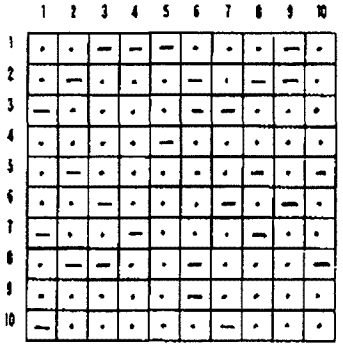

Solution for Morseword No 56
Across: 1 eager; 2 reap; 3 dims; 4 sense; 5 left; 6 fear; 7 nail; 8 past; 9 sins; 10 bits.
Down: 1 felt; 2 raid; 3 bare; 4 bib; 5 tides; 6 peep; 7 fast; 8 rents; 9 gibe; 10 safe.

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VK6 GPO Box F319 Perth WA 6001

VK7 GPO Box 371D Hobart Tas 7001

VK8 C/o H G Anderson VK8HA
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VK9/VK0 C/o Neil Penfold VK6NE
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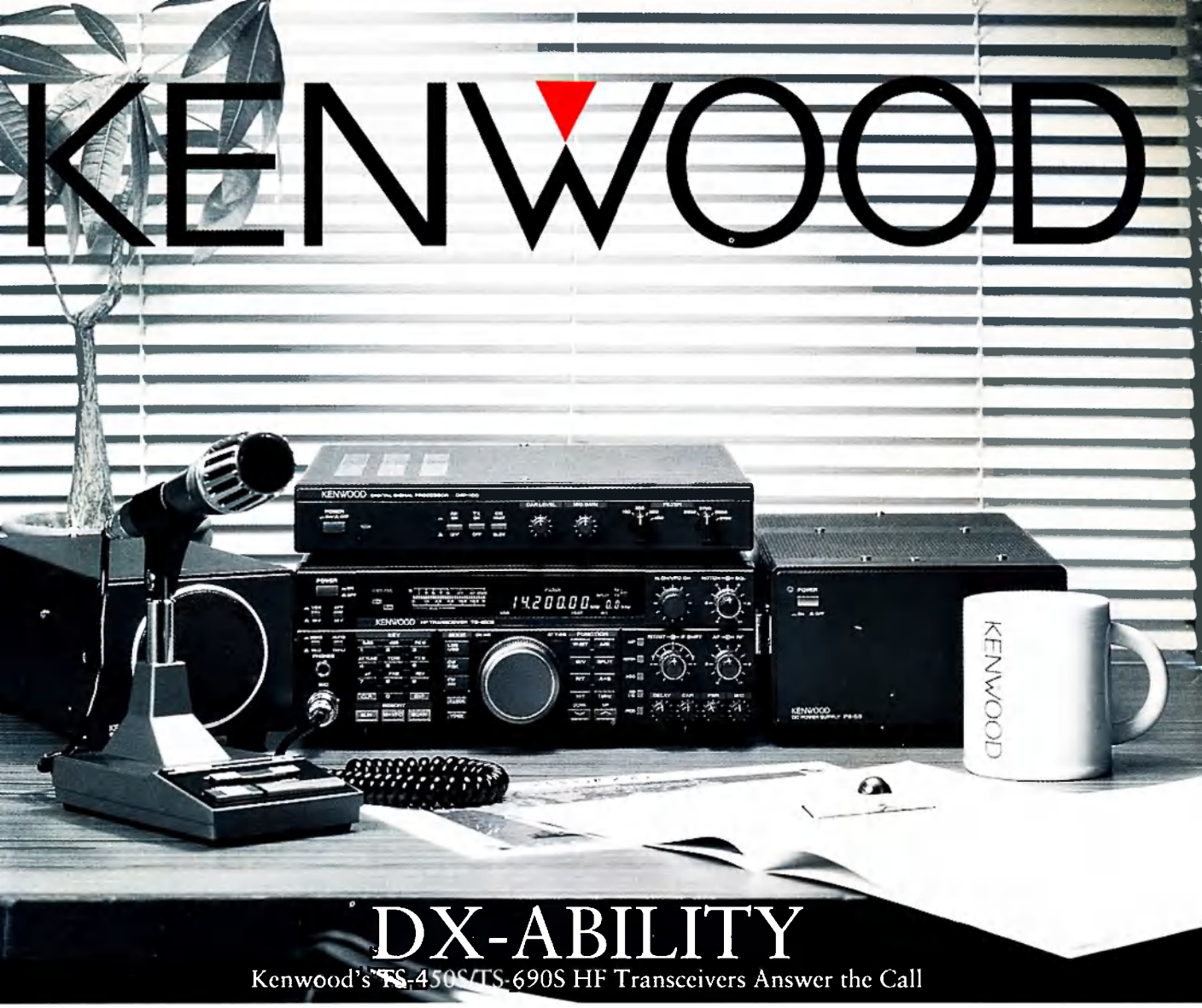

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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EXECUTIVE EDITOR
Bill Rice VK3ABP

MANAGING EDITOR
Graham Thornton VK3IY

SENIOR TECHNICAL EDITOR
Peter Gibson VK3AZL

Technical Editors
David Brownsey VK4AFA
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ADVERTISING
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BUSINESS MANAGER
Bill Roper VK3ARZ

All contributions and correspondence concerning the content of *Amateur Radio* should be forwarded to:
The Editor
Amateur Radio
PO Box 300
Caulfield South
Vic 3162

REGISTERED OFFICE
3/105 Hawthorn Road
Caulfield North Vic 3161
Telephone: (03) 528 5962
Fax: (03) 523 8191

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Cover

Our cover this month depicts Harry Angel VK4HA. Harry, who is still an active amateur, has his 100th birthday on 14 December. Are there any other active amateurs on earth of this age or is Harry in a "Century Club" of his own? For his profile, see "A Centurion Among Us" on page 32.
Photo: David Jones VK4KLV.

EDITOR'S COMMENT

BILL RICE VK3ABP EXECUTIVE EDITOR

Quart Into a Pint Pot

I defy anyone to produce a metric version of the above title with anything even approaching the same impact. "Litre into a half-litre etc" just doesn't seem to mean the same. In our case it means the task which faces Graham and me on what is usually the first Monday of every month (but sometimes the second), when we have to decide what material is to go into the next issue.

We thought many of you who support the WIA by sending in articles, letters, news items and so on might like to know the factors which determine how long before you will see it in print. Regular columnists are different. In exchange for the chore of having to put together a column each month they have the privilege of knowing when it will appear. Letters usually will get into "Over to You" within the month (unless they're too long or might stir up a hornets' nest, as discussed last month). But articles, either technical or of general interest, are usually a problem.

Technical articles usually require drawings. Few authors are competent as draftspersons. Those who are are doubly welcome, but most have to be sent out to Vicki (the drawings, of course, not the authors!).

All technical articles are carefully edited, perhaps even modified, to ensure they don't conflict too violently with the laws of physics. All this takes time, and when space is hard to find it can be six months or more before the article is printed; so please don't lose heart in the meantime.

General interest articles introduce another problem: topicality. Unless printed within a month or two of the event described, they become "stale". But there are already 20 or so articles waiting in the queue, and we can only fit in perhaps four or five each month. Which ones make it and which do not?

No matter what we poor editors do, someone is going to be upset. The only hope is to find more space. How? More pages? Only if there's enough advertising to pay for them (one page of advertising pays for about three pages of normal copy). Smaller type? We've been through that before. As is, most readers have no reading problem. Smaller, and the complaints start coming in. And, for good technical reasons, we can't just add one or two extra pages. We have to go from 56 to 64 in one jump. This month, as a Christmas bonus, we can do it, but it may be several months before we can do it again. Patience, please, people!

Finally, just to complicate our lives still further, all these factors vary cyclically. We are short of material; appeal for articles; you all respond magnificently; now there's too much! Delay, some authors disgruntled, stop writing; material runs low; back to square one! Typical period of the cycle seems to be about two years. In more ways than one, our fate is in your hands! And it's much better to have surplus articles, as at present, rather than not enough.

So, on that happy note, let's desist from all these complaints. Thank you all very much indeed for all your support through the year. May you all have a very merry Christmas and a happy 1992.

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Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest National Radio Society — Founded 1910

Representing the Australian Amateur Radio Service — Member of the International Amateur Radio Union
Registered Executive Office of the WIA: 3/105 Hawthorn Road, Caulfield North, Vic 3161
All mail to: **PO Box 300, Caulfield South, Vic 3162.** Telephone: (03) 528 5962

Fax: (03) 523 8191

Business Hours: 9.30am to 3.00pm on weekdays

General Manager and Secretary: Bill Roper VK3ARZ

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	Roger Harrison	VK2ZTB	**VK3 Federal Councillor:**	Peter Maclellan	VK3BWD
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WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

Quarterly Federal Meetings

The weekend of 26th - 27th October was the time for another of the regularly quarterly meetings of the WIA Federal Council and Executive. These weekends follow a fairly standard pattern. The idea is to have the complete Federal Council and Executive present for the two days to allow full discussion of matters that have arisen during the previous three months, progress reports on extended projects and consideration of future policy and planning.

As members know from the list published on page 2 of each issue of Amateur Radio magazine, each Division appoints a Federal Councillor who is the Division's representative on the WIA Federal Council, the governing body of the WIA. Each Federal Councillor also becomes a member of the Executive, the body charged with carrying out the policy and directions of the Council. In addition to the seven Federal Councillors, the Executive includes five other members and the WIA Federal President.

Between quarterly meetings, the small group of Executive members located in Melbourne keeps the machinery going and deals with the day-to-day administration of Federal affairs.

If there are WIA policy motions received on notice from Divisions, or policy recommendations come from the proceedings of the Executive deliberations, an Extra-ordinary Federal Council convention is convened to allow the Council to consider this business. What this means is that there are usually two meetings scheduled for the weekend. First of all the Executive meeting, at which all members of Executive may vote, and the Federal Convention, at which only the Federal Councillors vote as representatives of their Divisions.

In addition, at the last two weekend meetings, the Federal Councillors have taken the opportunity to have a short informal group discussion, without the Federal President, or non-Federal Council members of the Executive, present in order to compare Divisional views on current or future agenda items. This informal meeting is also attended by those Divisional Alternate Federal Councillors who are present for the weekend proceedings.

The meeting procedure follows a fairly standard pattern. After dealing with the minutes of the previous meeting time is allocated for reports from the Executive members on any specific individual activities and from the General Manager on matters relating to the operation of the

WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

Division	Address	Officers		
VK1	ACT Division GPO Box 600 Canberra ACT 2601 Phone (06) 247 7006	President Secretary Treasurer	Christopher Davis Jan Burrell Ken Ray	VK1DO VK1BR VK1KEN
VK2	NSW Division 109 Wigram St Parramatta NSW (PO B ox 1066) Parramatta 2124) Phone (02) 689 2417 Fax (02) 633 1525	President Secretary Treasurer (Office hours	Roger Henley Bob Lloyd-Jones Bob Taylor Mon-Fri 1100-1400 Wed 1900-2100)	VK2ZIG VK2YEL VK2AOE
VK3	Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 885 9261	President Secretary Treasurer Office hours 0630-1530 Tue & Thur	Jim Linton Barry Wilton Rob Hailey	VK3PC VK3XV VK3XLZ
VK4	Queensland Division GPO Box 638 Brisbane Qld 4001 Phone (07) 284 9075	President Secretary Treasurer	John Aarsse Bob Lees Eric Fittock	VK4QA VK44ER VK4NEF
VK5	South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 352 3428	President Secretary Treasurer	Rowland Bruce John McKellar Bill Wardrop	VK5OU VK5BJM VK5AWM
VK6	West Australian Division PO Box 10 West Perth WA 6005 Phone (09) 388 3888	President Secretary Treasurer	Cliff Bastin John Farnan Bruce Hedland-Thomas	VK6LZ VK6AFA VK6OO
VK7	Tasmanian Division 148 Derwent Ave Lindisfarne Tas 7015	President Secretary Treasurer	Tom Allen Ted Beard Peter King	VK7AL VK7EB VK7ZPK
VK8	(Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28MHz).			

Note: All times are local. All frequencies MHz.

Weekly News Broadcasts	1992 Fees	
3.570MHz	(F)	$70.00
2m ch 6950 Rebroadcast Mondays 8pm	(G) (S)	$56.00
70cm ch 8525 2000 hrs Sun	(X)	$42.00
From VK2WI at 1045 and 1915 on Sunday on the following frequencies and modes: (*1045 only): 1.845 AM; 3.595 AM morning and SSB evening; 7.148 AM*; 10.125 SSB; On relay 14.160 SSB* and 21.170 SSB; 28.320 SSB; 52.120 SSB; 52.525 FM; 144.120 SSB; 147.000 FM; 438.525 FM; On relay 584.750 ATV sound; 1281.750 FM. Plus automatic relays to 2m repeaters surrounding Sydney and manuals to several country repeaters. News headlines by phone (02) 552 5188	(F) (G) (S) (X)	$66.75 $53.40 $38.75
1.840MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 146.700 FM(R) Mt Dandenong 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday	(F) (G) (S) (X)	$72.00 $57.50 $44.00
1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296. 100 0900 hrs Sunday Repeated on 3.605 & 147.150MHz, 1930 Monday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
1820kHz 3.550MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North Barossa Valley 146.825, 438.425 (NT) 3.555M 146.500, 0900 hrs Sunday	(F) (G) (S) (X)	$70.00 $56.00 $42.00
146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115, 14.175, 21.185, 28.345, 50.150, 438.525MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury) 147.225(R) 147.250(R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs	(F) (G) (S) (X)	$60.75 $48.60 $32.75
146.700MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs	(F) (G) (S) (X)	$67.00 $53.65 $39.00

Membership Grades
Full (F) Pension (G)
Needy (G) Student (S)
Non receipt of AR (X)

Three-year membership available to (F) (G) (X) grades at fee x 3 times

The President's Christmas Message

Everywhere we look these days we see the effects of change and uncertainty. It would seem the only thing we can say with any certainty is the rate of change is accelerating. There are many changes that are currently affecting our hobby — let us think about some of them.

Firstly, the major changes in the examination system — the second of such changes in the space of a couple of years. Hopefully, the department will be able to leave the current arrangements in place for quite a few years, and things will settle down again. Secondly, take a browse through the advertising pages of *AR* and, as you do, think what things were like a few years back — perhaps the most noticeable is the replacement of analogue displays with digital readouts. Look also at the options that are now available — what was a "special extra" a few years ago is now a standard item.

So, what can we conclude from this? I would like to suggest a couple of things. First, change is sometimes difficult and painful, but this does not mean it is a bad thing — only that the new process may take us a little while to adjust to it. During this time there is often the need for some fine tuning — feedback from the users that will improve the process. Second, the changes can bring us benefits and make life easier.

Where does that leave us? Well, we can take the easy way out. We can get through life without ever expressing an opinion, without ever generating a new thought. We can accept the benefits and never seek a new challenge. In other words, we can stay in our "comfort zone", as the sociologists like to call it.

Or we can follow in the tradition of the amateur service. If those first amateurs had never painstakingly set up the tests necessary to test the ability of "short waves" to communicate around the world, then where would we be? If succeeding generations of amateurs had not done their bit to push back the frontiers and, in so doing move, out of their comfort zones, then amateur radio — and indeed radio technology as a whole — might still be a pale shadow of what it is today.

This is all very well as a piece of philosophy, but what does it do for us here and now? Well, there are lots of ways of pushing back the frontiers. Some frontiers are technical, and we have many very capable amateurs in our ranks who are doing just that. Some of the frontiers are administrative, and here we are fortunate to have many amateurs who have assisted in preparing papers for the recently held IARU Region 3 Conference. It is a tribute to their ability that many of these papers were accepted with minimal changes. Of particular importance here was the paper "Australian Guidelines for Packet Radio Operation". Some of the frontiers are regulatory, and it is clear from government activities in other related areas (eg telecommunications) that policies are being formulated on the deregulation of the radio spectrum. Again, the "crystal ball gazers" in our ranks are doing their best to formulate ideas on how we should react to such proposals.

So what part can an individual radio amateur play? By looking at the hobby with his or her own eyes and skills and then deciding which part of the frontier can be pushed back. How to do this? Easy! Don't stay in your comfort zone — participate in your local club or special interest group activities. Participate in your WIA Division's activities. And, most important of all, participate in the usage of the radio spectrum — after all, that was why we all got our licences in the first place, wasn't it? But in all these things, try to move out of your comfort zone. As you relax over the Christmas break, think of something new you can do for the hobby of amateur radio in 1992! Perhaps you could look on it as a way of "repaying" the enjoyment you have had from the hobby.

On behalf of the Federal Council, the Federal Executive and the General Manager and staff of the Federal Office, I would like to wish you and your families the compliments of the season, and may 1992 be a challenging year for you!

PETER GAMBLE VK3YRP
FEDERAL PRESIDENT
ar

GAMBLE (Sessions). — Lea and Peter proudly announce the arrival of their son:
Matthew William
(3.9kg-8lb 10oz) on 30 Sept 1991 at St George's Hospital, Kew. Mother and son both doing well.

Executive Office. Inspection and discussion of the financial reports and recruiting statistics for the past months generally take some time. Inspection of the list of non-routine correspondence generally allows a number of items to be deleted as completed as members of the Executive, the President, or the General Manager report on the action that has been taken. All other incomplete business, such as motions to Council, resolutions of Executive or DoTC action items are inspected and progress is reported, so completing the routine part of the meeting and leaving the remaining time for the major items on the agenda.

The Saturday evening is usually devoted to a meal followed by informal discussion of future agenda items or matters affecting the WIA or the Executive. No votes are taken, and no records kept, but this session allows any member to introduce a topic that may not have been raised otherwise, or to air views or grievances. It is noticeable that these sessions are becoming still less formal, but more productive.

The agendas for these most recent quarterly meetings were unusually extensive because of the need for consideration of the Federal budget for 1992, and the determination of the Federal component of the membership subscription, in addition to the presentation of reports from a number of sub-committees charged with specific tasks.

Executive Meeting

Following are some of the items discussed at the Executive Meeting:

WARC 92

David Wardlaw reported on the current status of the Australian preparation for this major event. The last of the Australian Preparatory Group meetings has been held, although there are still some CCIR and Delegation meetings to be attended.

After extensive discussion on the merits, financial aspects, and implications of the WIA sending two delegates to Torremolinos in February for the WARC 92, it was eventually resolved that policy should be to recommend two persons to attend, this to be reduced to one only if that should become necessary for any reason. The two delegates to represent Australian radio amateur

service will be David Wardlaw VK3ADW and Ron Henderson VK1RH.

Region 3 IARU Conference Report

Ron Henderson, as leader of the WIA delegation to the IARU Region 3 Conference in Bandung in October this year, tabled a report of the group's activities. Members of the delegation participated in both general and small-group events. Amongst other things, input was provided on packet protocol (the Australian guidelines were adopted as the Region 3 Guidelines almost unaltered - see elsewhere in this WIANEWS), bandplanning, band allocations, and direction-finding.

All of the four WIA delegates who attended felt that it had been worthwhile, and returned with many post Conference tasks to complete. A full report of the Conference will be published shortly.

50 MHz Beacon Policy

A report and recommendations from John Martin VK3ZJC, the Federal Technical Advisory Committee (FTAC) co-ordinator, on the policies to apply to frequencies and locations of the 6 metre beacons was received and discussed in detail before being recommended for adoption by the Federal Council. The final document differed very little from the details published on page 48 of the October 1991 issue of Amateur Radio magazine.

Examinations

The meeting studied the report on the WIA Exam Service presented by the General Manager. In accepting the report the Executive noted its appreciation of the time, energy and effort expended by the General Manager in achieving a functioning examination system in such a short time. Although at this stage costing can only be done on estimates based on limited information, preliminary calculations indicate that the setting up costs should be recovered within the specified three year period, and the WIA Exam Service should be self-funding. The opportunity was taken to ensure that all attending the meeting were fully informed as to the functions and responsibilities of the WIA Exam Service.

In addition the Executive approved the formation of a Committee to be responsible for review and expansion of the examination question banks.

Revision of DoTC Licence Conditions

As a response to discussions with the Licensing Section of DoTC in Canberra, the WIA has been considering ways in which further deregulation of the Amateur Service could be achieved. Two papers relating to deregulation were presented. John Martin VK3ZJC, the WIA FTAC Co-ordinator, after conferring with the Divisional TACs and repeater user groups, recommended a streamlining of the regulations concerned with repeaters, beacons, packet and RTTY.

Kevin Olds VK1OK, as chairman of a sub-committee examining the DoTC regulations brochures, recommended further reductions in the regulations relating to repeaters, beacons, packet and RTTY, as well as to club stations, and station identification.

Both reports were accepted by Executive and will form the basis of submissions to the DoTC.

WIA Objectives for 1992-3

A paper tabled by Ron Henderson VK1RH, opened discussion on the goals and objectives of the WIA for the immediate future. The paper grouped the activities of the WIA Federal body into the major fields of Publications, Executive Office, and International Representation. Although in most of the field subdivisions the objectives were mainly to continue or upgrade the current activities, it was felt that such a consideration of the range of activities of the Federal Body is necessary to ensure that some activities are not being neglected by over-emphasis on other activities.

1992 Federal Budget

Divisions were notified at the Annual Federal Convention held in April 1991 that the Federal budget for 1992 would be set at the October meeting, and were asked for input.

This topic is always contentious, as Divisional views vary considerably. While the idea of uniform membership fees for all Divisions has been advocated for several years, it has become increasingly apparent that this goal will not be achieved in the short term, as the services provided by the Divisions also vary greatly.

Keeping in mind the current state of the national economy, the Divisions agreed that increases in the subscriptions should be minimised, resulting in an overall increase of less than the CPI increase. It is not, of course, possible to avoid some increase, as so many of the costs of service to members are not under the control of the WIA. In addition, the threat of Australia Post to substantially modify or abolish the Category B postal rate must be considered, as this action could double the cost of mailing Amateur Radio magazine to members.

Full details of the 1992 membership fees appear in the right hand column of the WIA Divisions directory appearing on page 3 of this issue of Amateur Radio magazine. Members will note that the slight increases are all below CPI, clearly indicating the continuing high level of financial management practised by the WIA.

4266 members will receive membership renewal notices in the post early in December.

Please renew your membership promptly by cheque or credit card. If renewing by authorising the WIA to debit your plastic card, please carefully check the credit card numbers when you write them on the membership renewal slip, and ensure that you have signed the authority before posting it to the WIA Executive Office.

Incidentally, receipts are not issued for membership renewals unless your remittance is accompanied by a request for a receipt and a stamped, self addressed envelope.

Options for Publication of Amateur Radio

In response to extensive discussions at a number of meetings, Ron Henderson tabled a short paper summarising the possible options for the future of Amateur Radio magazine. The meeting agreed that the idea of merging the magazine with a commercial electronics magazine is not feasible from an economic viewpoint, nor would it be in the interest of members, but accepted that there is room for upgrading the standard of the present magazine. Roger Harrison was charged with researching a range of possible options and will report back on costs and feasibility at the next quarterly meeting.

Shutdown of Repeaters

Peter Maclellan VK3BWD, tabled a paper recommending guidelines for determining the circumstances under which repeaters should be shut down. After discussion, the paper was accepted (see full details elsewhere in WIANEWS).

EXTRA-ORDINARY FEDERAL CONVENTION

This quarterly meeting of the Federal Council was the busiest for quite some time. Matters of policy decided, in addition to those items mentioned above as Executive recommendations to Federal Council, included:

Repeater Linking Standards

The Federal Council adopted the repeater linking standards (as circulated at the 1991 Federal Convention by the VK4 Division) as a set of interim guidelines. The full guidelines are published elsewhere in this issue of Amateur Radio magazine, and will be reviewed at the 1992 Annual Federal Convention.

WIA Federal Structure

After considerable discussion, the Federal Council passed several motions which directed that no further efforts and resources be expended in pursuit of a national model for the WIA, that consideration of an additional, Commonwealth Division be abandoned, and that the roles of the Federal Council and Executive be reviewed.

Reciprocal Licensing with Spain

Notification has been received from the DoTC that the Australian Embassy in Madrid has finalised the Reciprocal Radio Amateur Licensing Arrangement with Spain, to take effect from 60 days after the 3rd October 1991.

Australian licensees holding AOCP, AOLCP or NAOCP will be entitled to Grade A, Grade B or Grade C licences respectively. Of course, the Spanish regulations must be observed when operating in Spain.

This reciprocal licensing arrangement took over six years to put in place, and is an example of the protracted diplomatic negotiations that are often necessary in these matters.

Executive Office on Air

Through the generosity of Kenwood Electronics Australia Pty Ltd, and Mr Joshua Mui, the Federal Body of the WIA has recently been presented with a TM-231A 2 metre transceiver for use in the Executive Office. When a suitable power supply is arranged, the set will be ready for use.

Let me hasten to assure members that this does not mean that the office staff will be spending their days on the repeaters, or that 2 metres will supersede the regular communications channels of telephone, fax and mail.

The WIA wishes to record its thanks for Kenwood's donation.

Packet Radio Guidelines

The WIA submitted a draft proposal for packet radio guidelines to the recent IARU Region III triennial conference in Indonesia. This proposal was adopted by Region III, and delegates from the other regions showed great interest.

At the October meeting of the WIA Federal Council these packet radio guidelines were formally adopted as the Australian Packet Radio Guidelines. Here they are:

Guidelines for Packet Radio Operators

1. Amateur radio takes pride in being self-regulated. Packet Radio Operators should continue this tradition.
2. Packet Radio Operators, like all Amateur radio Operators, should observe published Band Plans.
3. A Packet Radio Operator should not send the following traffic, either direct or via mail boxes:
   a. All advertising for selling, buying or trading goods, including amateur equipment (except if permitted by local regulations);
   b. All statements on propaganda or political or religious subjects;
   c. All inappropriate language, as, for instance, the use of swear words, obscenities, defamatory or libellous language etc;
   d. All material which may infringe copyright; and
   e. All material which infringes privacy, whether personal or corporate.
4. A Packet Radio Operator using a BBS should avoid transmitting unnecessary or redundant messages and documents, in order to enhance network efficiency.
5. A Packet Radio Operator utilising a BBS should ensure that the callsign of the originating station, including the name of the person responsible in the case of a club station, is clearly shown on every message so the sender can be identified.
6. A packet Radio Operator should avoid messages that are too long for efficient relay through the network.
7. A Packet Radio Operator utilising a BBS should ensure that all messages transmitted are addressed to the appropriate group of recipients and not addressed to inappropriate areas in order to enhance network efficiency.

Guidelines for Packet Radio Bulletin Board Operators

1. The Operator of a Packet Radio Bulletin Board is obliged to provide a reliable service, within a defined area for a defined purpose.
2. A Packet Radio Bulletin Board operator is morally responsible for all messages forwarded by his system. He should make his best efforts to ensure that the traffic forwarded is appropriate to the Amateur Radio Service and in accordance with the Guidelines for Packet Radio Operators.
3. HF Mailboxes should only be used where there is a genuine need that cannot be provided by VHF or other means.
4. A Packet Radio Bulletin Board Operator may take action to exclude a User who persistently contravenes Guidelines for Packet Radio Operators. Excluding a User should only be done as a last resort after the User has been warned and where exclusion does not contravene local regulations.

Allocation of VK9 Amateur Callsigns

The WIA has received a copy of the recently updated guidelines established by the DoTC for the issue of VK9 callsigns. These guidelines should now clarify the position, and please a number of amateurs who have been lobbying for a return to a geographic pattern of issue.

The allocation of VK9 callsigns is no longer handled by the DoTC computer. In order to satisfy the requirements of the amateur service, the issuing of all VK9 callsigns has to be done manually at each DoTC office. The system is listed in the accompanying table.

Shutdown of Repeaters

At the meeting of the WIA Executive held over the weekend of 26th and 27th October 1991, it was resolved that the Executive, noting:

a. that the licensee of a repeater is responsible for its operation; and

b. the WIA Voice Repeater Guidelines (see below)

RECOMMENDS that the repeater licensee shut down

the repeater in the event that:

1. continued operation is or will be in breach of DoTC regulations;
2. operation will lead to a breach of agreements or interference to the service of organisations or individuals participating in the installation or site; and
3. there has been, and it appears likely there will be, persistent or wilful operation in contravention of repeater voice or packet operation guidelines.

Voice Repeater Guidelines

Purpose of Repeaters:

Repeaters are established primarily to extend communication range of mobile stations in the VHF and UHF bands. However, they may also be used as calling channels for initial contact before switching to a simplex frequency. As well, they provide contact facilities for radio amateurs in remote locations where simplex communication is not normally possible.

Operating Conventions:

Each transmission should not exceed 2 minutes. Repeaters have timers to limit transmission length.

Before replying, let the repeater "drop out" and wait at least 3 seconds before transmitting. This allows others immediate access (see #).

Do not reset the timer to extend your own transmission time.

Keep contacts brief and to the point. If you have nothing to say, don't say it! Limit your group QSO to a maximum of 10 minutes.

Avoid over-use of callsigns. They are required at the start and end of a contact, and at least once every 10 minutes. But callsigns can be dropped from the start and end of transmission during a contact. Phonetics are also over-used on repeaters, particularly in callsigns.

#To gain access to a repeater which is being used by others, simply announce your callsign during the pause between overs.

#If using a repeater and another station announces its callsign during the pause, let that station go ahead immediately. He or she may have an urgent message.

Do not transmit on repeater output frequencies. Use reverse facilities only to observe another station's input signal strength. If satisfactory, then QSY to a simplex channel.

Ignore annoying transmissions. Do not respond or comment on a transmission not identified by callsign.

There is no need to call CQ on repeaters. Just announce your callsign and say you are listening on the frequency.

The use of repeaters for liaison to establish a contact on another band is permissible, but cross-band contacts using a repeater are not encouraged. Where cross-band contacts are made all frequencies must be announced by all parties.

Priority must be given to normal repeater usage.

Summary:

Be courteous and unselfish at all times, and always be aware of the needs of other people who have an equal right to share the repeater.

If you hear someone new to repeater operation, assist and educate them in a courteous manner.

Remember others, including new and potential radio amateurs, monitor repeaters - the image of Amateur Radio is important.

VK9 CALLSIGN TEMPLATE

Territory	Unrestricted	Limited	Combined	Novice
Christmas Is	VK9Xa	VK9ZXa	VK9KXa	VK9NXa
Cocos Is	VK9Ca	VK9ZCa	VK9KCa	VK9NCa
Lord Howe Is	VK9La	VK9ZLa	VK9KLa	VK9NLa
Mellish Reef	VK9Ma	VK9ZMa	VK9KMa	VK9NMa
Norfolk Is	VK9Na	VK9ZNa	VK9KNa	VK9NNa
Willis Is	VK9Wa	VK9ZWa	VK9KWa	VK9NWa

Note: 'a' represents any letter of the alphabet a to z

International Representation Fund

Donations to this important fund received since the last acknowledgment include those from:

Mackay Amateur Radio Association (Inc);

RAAF Williams Amateur Radio Club; and

Quantas Amateur Radio Club.

The WIA thanks all these contributors. The demands on this fund are very high at present with the recently concluded IARU Region III conference in Indonesia and the WARC coming up in February next year in Spain. All donations are gratefully acknowledged by the WIA in the continuing fight to retain our amateur service privileges.

Delivery of Amateur Radio

There were some problems with the delivery of the November issue of the WIA magazine. The machine used by the mailing house to insert the address fly sheets in each copy of the magazine obviously had some hiccups and a number of members found, to their surprise, that there was another member's address fly sheet enclosed with their copy of the magazine.

The WIA would like to thank those members who notified the Executive Office when they received another member's address label with their own. A complaint has been lodged with the mailing house and we are assured the problem will not occur again.

However, if you do get another member's address label inside the magazine packaging, please let the Executive Office know as soon as possible so that the member whose label it is will not miss out on a copy of Amateur Radio magazine.

3-Year WIA Membership

Each year an increasing number of WIA members are realising the advantages of renewing their membership for three years. Unless you are a student member, or are not resident in Australia, why not try it?

All you have to do is forward a remittance for an amount equal to three times the renewal amount shown on the membership renewal notice. Then you will not be affected by the inevitable fee increases for the next two years.

End of 1991

Well, that's WIANEWS for 1991. I trust the column has gone some way along the track of keeping members informed of what was happening in the federal arena of the WIA.

I would particularly like to thank Brenda Edmonds VK3KT for her invaluable assistance in producing WIANEWS during 1991, and also Ron Henderson VK1RH.

On behalf of all the crew at the Executive Office I wish you all a very happy and enjoyable Christmas, and a safe and prosperous 1992.

BILL ROPER VK3ARZ

ar

Prevent pirates – make sure you sell your transmitter to a licensed amateur

MULTIPLIER CW TRANSMITTER FOR 3.5/7/14MHz

DREW DIAMOND VK3XU
NAR MEIAN, GATTERS RD.
WONOA PARK VIC 3115

A NUMBER OF ENTHUSIASTS have written suggesting the following project: a relatively simple CW transmitter or exciter to cover three popular HF bands, with VFO control, providing about 2-4W output power without fancy parts. Here is an answer to those valued requests. I hope you like it.

Performance

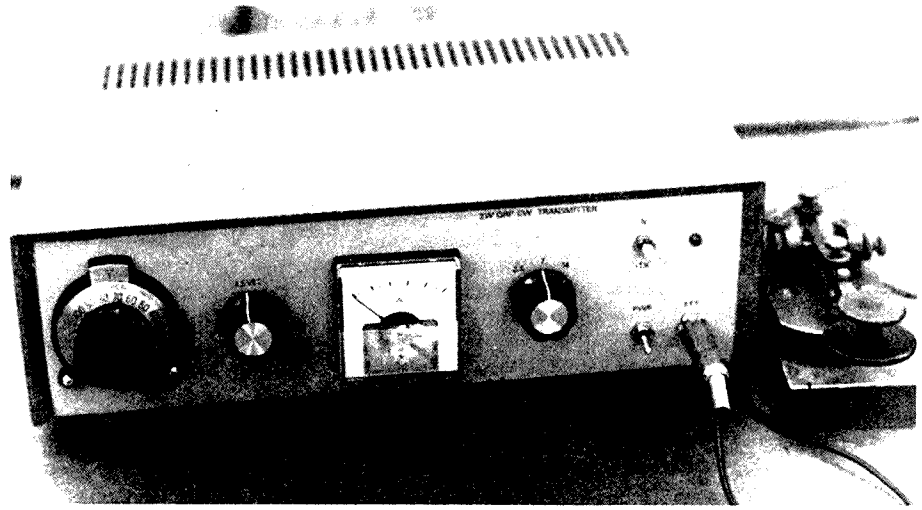
Frequency Range:	3.5 to 3.58MHz, 7.0 to 7.16MHz and 14.0 to 14.32MHz.
Output Power:	Nominally 2W, typically 4W into 50 ohms.
Unwanted Products:	All products are harmonically related, and at least -43dBc, typically -50dBc.
Frequency Stability:	In the order of 60Hz/10min. on 14MHz after 30min. warm-up.
CW Keying:	At least 70dB, no click or chirp.
Load Tolerance:	Will withstand any SWR, including short and open circuit without damage.
Supply:	Nominally 12-13.8Vdc at up to 1A.

Equipment Required

High impedance voltmeter and RF probe, 50ohm dummy load, transistor gain tester, HF receiver and the usual hand tools. Drill press and pin chuck desirable.

Circuit

A Colpitts oscillator maintained by FET Q2 supplies the 3.5-3.58MHz signal. To reduce frequency drift, the oscillator runs continuously. The VFO is well shielded, but a sub-microvolt signal was still audible, so during receive periods the VFO runs above the listening channel. On transmit or net, transistor Q1 switches



General View

CI into circuit and the frequency is pulled down onto the working channel. Buffer amplifier Q3, a dual-gate FET, raises the power to about 7mW and isolates the VFO from load variations. By making the gate-two voltage variable, we have a means of altering the output power to suit operating conditions. Push-push doubler Q4-Q5 produces our 7MHz signal, followed by another doubler for the 14MHz signal. Active doublers are rather prone to parasitic oscillation, so the emitters are left unbypassed to enhance stability. If circuit balance is good, suppression of the input frequency will be at least 50dB. Each doubler is required to deliver in the order of 1mW, which is raised to 20mW by the broadband amplifier at Q8 (13dB gain) then to about 3W with power MOSFET Q9 (around 20dB gain) The waveform at the drain of Q9 can be very fruity and rich in harmonics. The signal must be therefore be cleaned up before application to the antenna. Seven-element low-pass filters (LPFs) for each band do the job nicely.

Various keying ideas were tried, including that of keying the oscillator (well, it was worth a try, but was too chirpy and clicky. Remember, all VFO frequency variations are multiplied by four at 14MHz!) Keying buffer Q3 was not bad, but still unacceptably chirpy. Keying amplifier Q8 provided click- and chirp-free operation, but the key-up 'back-wave' was only about 20dB below key-down. The final solution was to key Q8 and the bias to the MOSFET PA. The supply to these circuits is ramped up in about 5ms and down in 10ms by Q10 in response to the key (the popular Accukeyer circuit may be substituted for the hand key shown here).

Construction

It appears that some builders are discouraged by having to make printed circuit boards. Indeed, there is a perception that a circuit board must be used if the thing is to work properly. Most HF circuits will work entirely satisfactorily with just about any well-known construction method you choose, provided signal carrying conductors and by-pass leads are kept as short as practicable, and inputs are well separated from outputs. Stability is greatly enhanced by mounting the components above a good 'ground plane' substrate. Single or double sided circuit board material is ideal. For RF work, we should avoid any kind of board that uses parallel strips of copper and indirect grounds, eg Veroboard.

For this project I have moved to a practical alternative to the etched board. Where two or more components must connect, a matrix board pin is inserted into the circuit board, which is drilled to

the exact pin diameter for a snug fit. 0.9mm appears to be a common size, but do not assume dimensions — measure pin and drill with a micrometer if available. Vendors can generally supply pins and drills to suit. Very small drills are also available from engineers' tool suppliers. After drilling, the copper is removed from around the hole by carefully countersinking with a larger drill (see Ref 1).

We need a robust oscillator for this transmitter, and it is strongly recommended that the VFO be housed in a solid die-cast box in accord with contemporary practice for mechanical and electrical stability — the box providing the needed thermal inertia, mechanical rigidity and shielding. The 100 + 200pF capacitor shown is adequately suited to this application and readily available. The walls of the box are not perpendicular, so the level pot should be mounted upon a bracket with the shaft projecting through a hole as for the capacitor shaft.

Three circuit boards are required: VFO, doublers, and amplifier. I suggest you build the VFO first. It is vital that high stability capacitors are used in the VFO tank. Styroseal (polystyrene) capacitors are about half the cost of silver micas, temperature stable within normal limits and have a slight negative coefficient. For values below 100pF; NP0 types are ideal. You may have to change the value of C2 to obtain the correct frequency range if C4 cannot do it. Check the frequency and stability with the lid screwed into place. A screwdriver blade inserted in the output connector should radiate enough signal to be checked on the station receiver. If greater tuning range is required, simply connect a small NP0 capacitor between the tags of the 100 + 200pF unit to obtain the desired range.

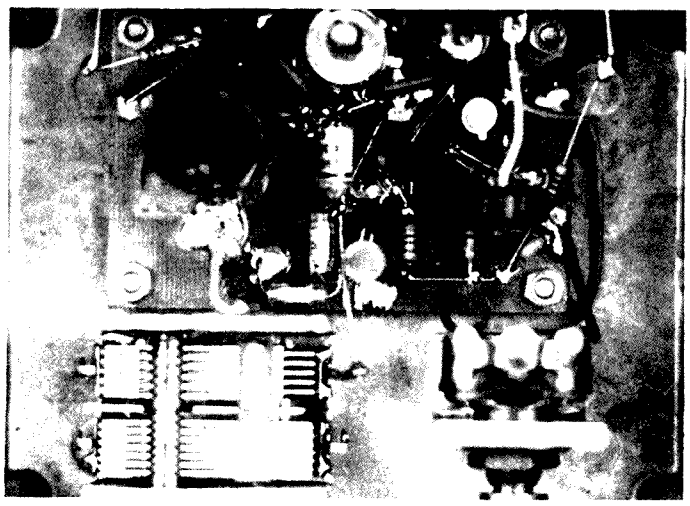
Driver & PA Board

The VFO tank coil L1 should be wound upon low loss, temperature stable material, 0.5" (12.7mm) diameter. Do not use plastic. PTFE (Teflon) is ideal, glass also good; ceramic if you can get it. Mine uses bakelised paper tube. The coil was wound under tension (that is, by anchoring the spool in a vice and walking towards it, maintaining tension all the way) on a hot dry day, then dipped in Estapol to seal it. Material which cannot be drilled will need small solder tags glued onto the former at appropriate points. Note that the coil is located greater than one coil diameter from any metal object. The ferrite bead on G2 of Q3 may be held in place with a small blob of wax.

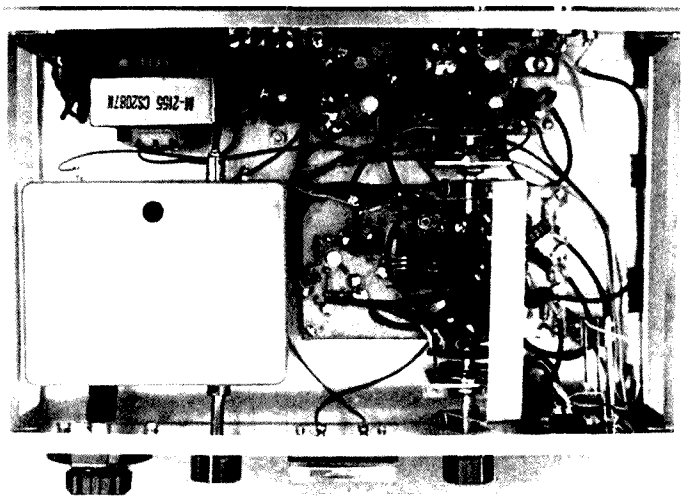
Broadband transformers T2 and T3 are made as follows. Take three 30cm long strands of #24 (0.5mm) enamel wire. Twist them together at one end and clamp that end in a vice. Arrange the wires mutually parallel, then twist the free ends together. Clamp the group in the chuck of a hand drill. Whilst keeping tension on the group, turn the drill until you have about three twists per cm, with no kinks or transpositions, ie the whole length must be uniform. Pull the drill to set the twists. Now wind the triplet onto the FT50-43 core — about 10 loops should fit nicely. Take care not to scratch the enamel. Cut the leads to about 3cm. With a multimeter on ohms, identify the 'primary', which can be any of the three 'windings'. Mark these with a marker pen and push them to one side out of the way. Now identify the starts and finishes of the other two windings. Connect the start of one to the finish of the other to form the centre tap. T4 and T5 are made in similar manner but with a #22 (0.63mm) and without the primary. Corresponding winding ends are shown on the circuit with a dot.

Test the gain of your five 2N3053s, and select two pairs for the doublers which are closely matched in gain, thus making possible a really effective phasing out of the unwanted input signal.

The band change switch posed a problem. The input to the amplifier must be a selection of either 3.5MHz from the VFO, or 7 or 14MHz from the doublers. To simply use one wafer to switch these along with the required LPF would be asking for trouble. Some physical separation is necessary to preserve circuit stability. There are very few wafer switches of more than one bank easily available. If you have one where a shield can be placed between input and output



VFO



Internal view showing board placement and switch

wafers, use it. Shown is a suggested approach. Two wafer switches, each with 3-pole/3-position are mounted upon brackets. A length of sheet metal is formed into a carburettor style linkage with 0.25" holes drilled through each end and slotted with a junior hacksaw. These are each clamped onto the shaft with a screw, washer and nut of appropriate size.

For accurate netting, some kind of reduction drive should be connected to the VFO capacitor. The vernier shown was purchased from Dick Smith's, P/N P7170. To take up any small misalignment, a length of 0.25" rubber fuel hose is used to couple the two.

Power supply requirement is 12 to 13.8V at up to 1A. A typical circuit is included here if required. Remember to cover all mains wiring to prevent accidental contact, and install a 500mA fuse and switch as shown. Mains earth must be connected to chassis ground.

The box shown is a K&W P/N C1284 measuring 30cmW x 20cmD x 9cmH. If this box is chosen, remember to allow for the front and back overhang of the cover when marking out.

The PA MOSFET should be mounted upon a #6030 heatsink. Fit a mica washer between device and sink, and an insulated washer under the securing nut. A solder tag under the washer provides the drain connection.

The capacitors in the LPFs should be styroseal or mica if available — avoid ordinary disc ceramics if you want a low loss filter. 1800pF greencaps may be substituted for C33 and C34. The braids of the coax connections at the band switch should all be joined together, as shown in the circuit.

Tune-up

From the foregoing it is assumed that the power supply is working, and the VFO is supplying a satisfactorily stable frequency. There should be about 1V open circuit voltage at the VFO output connector as measured with an RF probe and hi-Z meter.

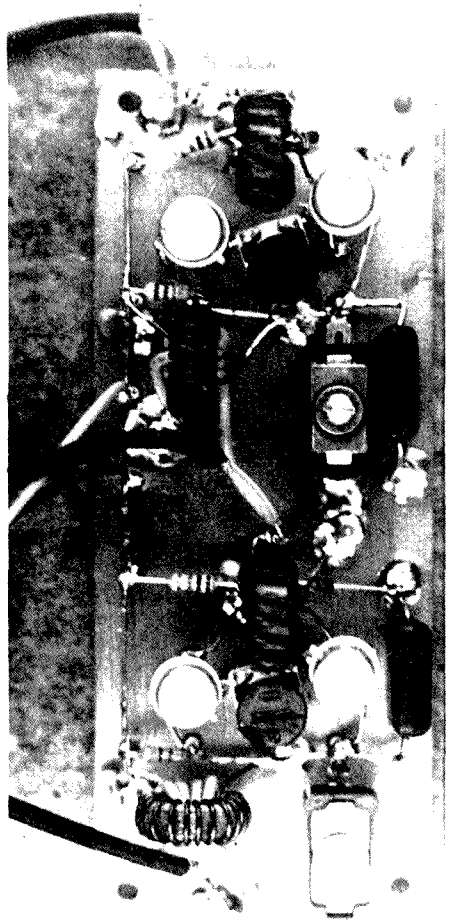
Check your wiring, and that all polarised components are correctly placed. Connect a 50ohm dummy load or power meter of adequate capacity to the TX output (two 100ohm 1W resistors in parallel upon a suitable connector will do). Turn level control R8 to min, and bias trimpot R23 to mid range, and balance trimpots R11 and R15 to mid range. Set the band switch to 3.5MHz and close the key. There should be about 1W output power. Adjust bias pot R23 so that about 500mA is drawn from the supply as a preliminary setting. Now turn up the level control. You should see a smooth rise in power to about 4W, represented by 14V measured across 50 ohms with the RF probe. The current should rise to about 900mA. Listen to the keyed signal on a receiver. It should sound clean and chirp free. You may have to connect a short clip lead to the hot side of the load to get a better sample.

Now set the band switch to 7MHz. Close the key, and peak C20 for maximum signal at about 7.025MHz. Do the same at 14.05MHz with C23. On 7MHz, connect the RF probe to the collectors of Q4-Q5, and carefully adjust R11 for the just perceptible dip as the unwanted 3.5MHz component is phased out. Connect the probe at Q6-Q7 and do the same on 14MHz for the unwanted 7MHz component by adjusting R15. If you cannot see the dip (it is very small), listen to the unwanted signal on your receiver and adjust for best null.

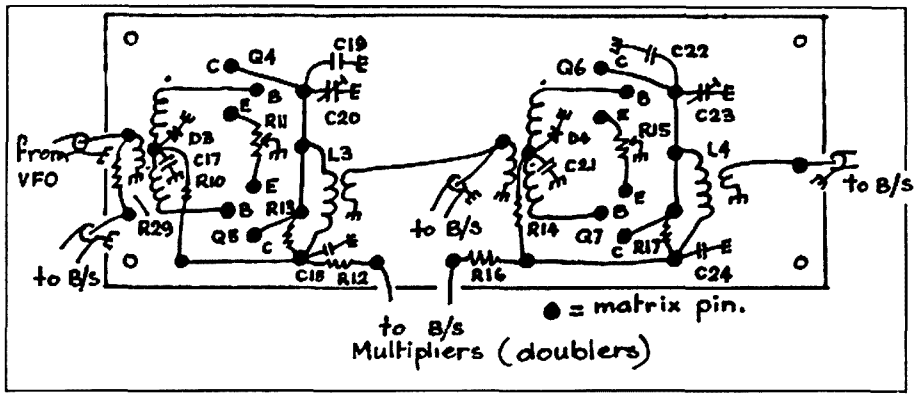
Overall efficiency is lowest on 14MHz (the useful limit of the MOSFET in this configuration), so we may make a final adjustment of the standing PA drain current by setting the level pot to min. Close the key and adjust the bias pot for about 500mA. Rotating the level pot should cause the current to rise smoothly to about 800mA at 3W output.

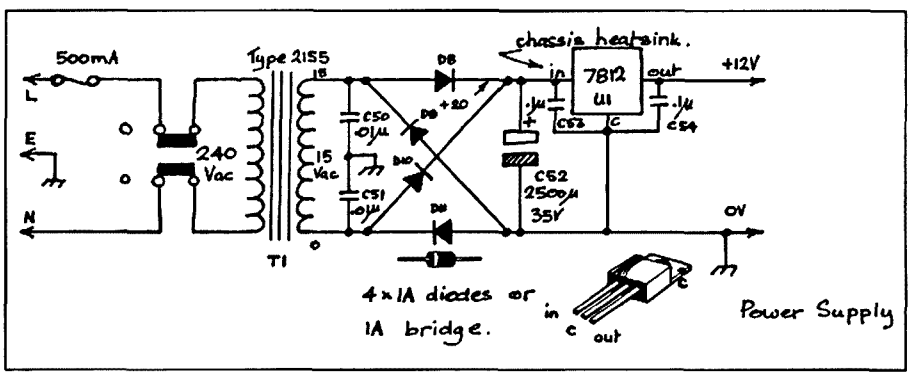
Problems

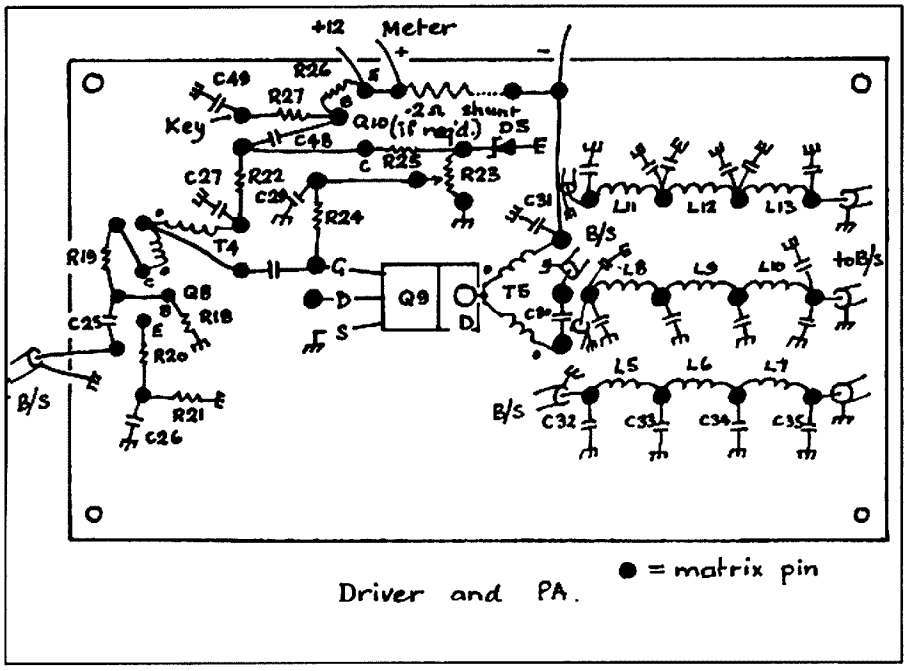
There are no perceived traps for the handy radio/electronics enthusiast. If you have followed the suggested approach, the oscillator should be sufficiently stable

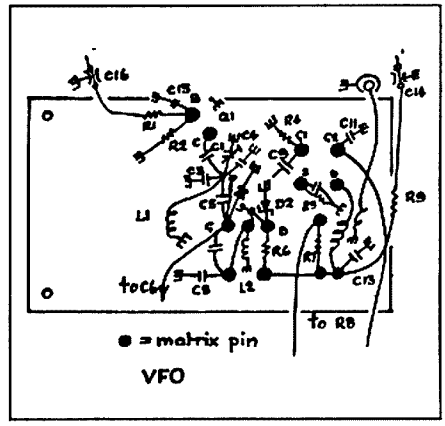


Multiplier Board









for normal purposes. Thirty minutes or so of warm-up time should have the device slowly cycling up or down only a few tens of Hz per TX/RX over on 14MHz.

To eliminate warm up delay, there is no harm in leaving the set on 24 hours per day. See Ref 2 for further notes on VFO construction. Some salient RF and DC voltages are shown to aid in any trouble-shooting. When netting onto a strong station, you may also have to close the key to obtain a stronger netting signal (the signal is not put to air). If you cannot solve a problem with this project, please write, including an SASE, and any reasonable amount of help will be returned.

Parts

The bulk of components chosen are known to be available from the usual electronics retailers. Here in VK3, we are fortunate in having two suppliers of radio type bits: Stewarts (03 543 3733), which can supply Amidon cores and most components, and Electronic World (03 723 3860) for all components, including the 3x3 wafer switches, the power MOSFET and the variable capacitor. Other Amidon suppliers regularly advertise in this journal.

A Stronger Signal

It is easily possible to work stations far and wide, and derive great satisfaction with just 3W, even with a modest antenna. Nevertheless, you may wish to add an amplifier at some later date. The 25W MOSFET linear amplifier described in *AR* Jan '91, with the addition of a 14MHz LPF will suit this TX, and makes a useful enhancement to the set. Anticipate about 30W on 3.5MHz, 15W on 14MHz.

Miscellaneous

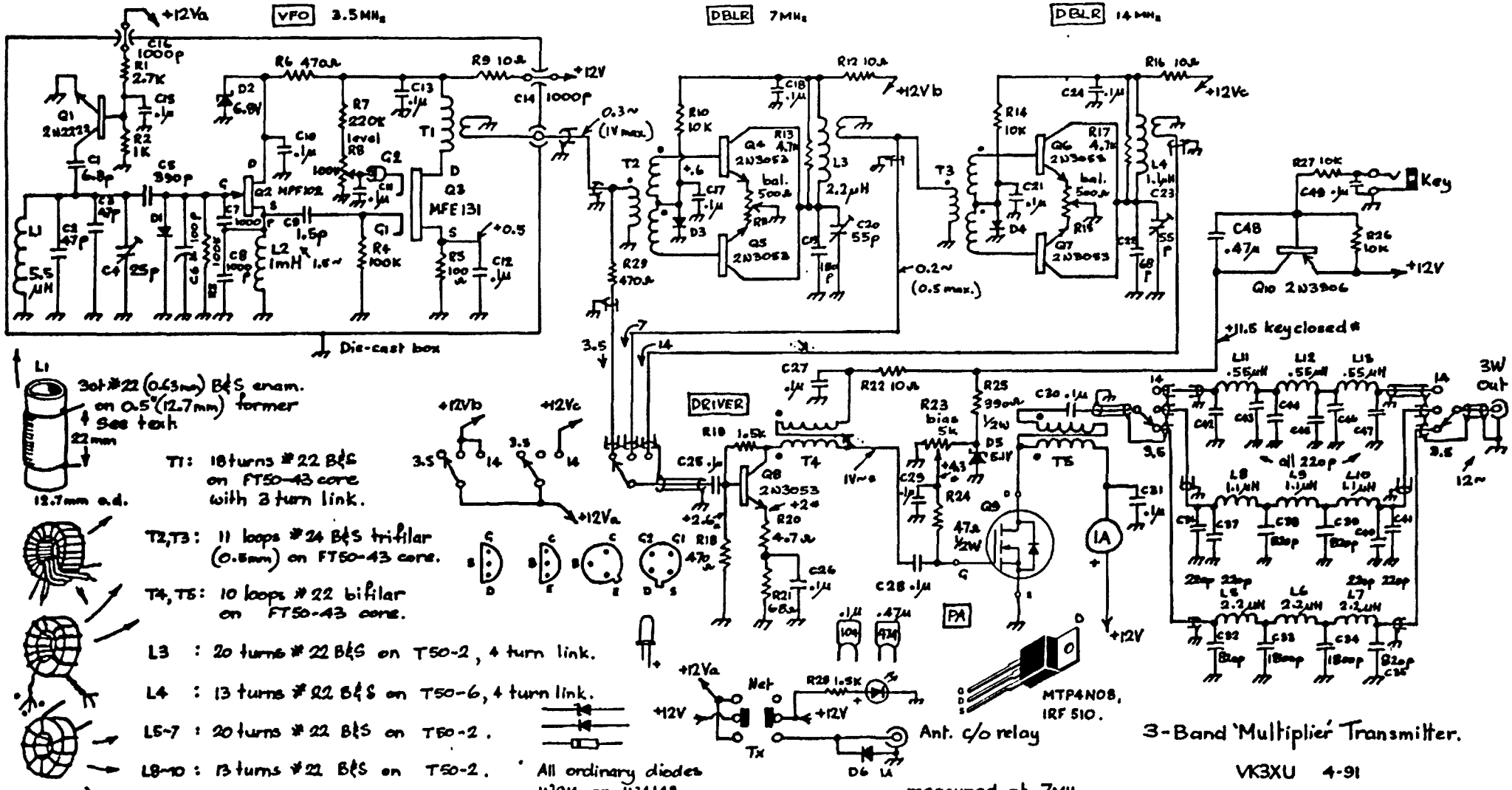
Case to suit or material for same, die-cast box 120 x 95 x 56mm, wafer switch 3 or 4 pole/3 pos (2), DPDT centre off switch, DPDT switch, vernier dial and coupler, knobs, circuit board material, pins 1A meter or 1mA meter with 0.2ohm shunt, VFO coil former, 6030 heatsink and insulators, hook-up wire, #20, #22 and #24 winding wire, miniature 50ohm coax, key socket, coax sockets, spacers (16), aluminium for brackets and linkage, screws, nuts.

References and Further Reading

1. How to Lay Out RF Circuits, White, G3SEK, *Rad Comm* Feb/Mar '91.
2. Some Practical Tips on VFO Construction- *AR* Jan '88.
3. Solid State Design, Hayward & DeMaw, *ARRL*.
4. W1FB's Design Notebook, DeMaw, *ARRL*.
5. QRP Classics, *ARRL*.

Parts List for the Multiplier Transmitter

Capacitors	
1.5pF NP0	C9
6.8pF	C1
47pF	C2, 3
68pF	C22
25pF "beehive" air variable	C4
55pF (approx.) compression mica	C20, 23
100pF air variable	C6
180pF polystyrene or mica	C19
220pF polystyrene or mica	C36, 37, 40, 41, 42, 43, 44, 45, 46, 47
390pF polystyrene or mica	C5
820pF polystyrene or mica	C32, 35, 38, 39
1000pF polystyrene or mica	C7, 8
1800pF polystyrene or Greencap	C33, 34
1000pF feedthru	C14, 16
0.01µF/100V ceramic	C50, 51
0.1µF monolithic or ceramic:-	C10, 11, 12, 13, 15, 17, 18, 21, 24, 25, 26, 27, 28, 29, 30, 31, 49, 53, 54
0.47µF monolithic or ceramic	C48
2500µF/35V electrolytic	C52
Resistors	
4.7ohm, 1/4W	R20
10ohm, 1/4W	R9, 12, 16, 22
47ohm, 1/2W	R24
68ohm, 1/4W	R21


VFO 3.5MHz
DBLR 7MHz
DBLR 14MHz
DRIVER
PA
+12Va
+12Vb
+12Vc
Die-cast box
L1
3ot #22 (0.63mm) B&S enam. on 0.5" (12.7mm) former
See text
22mm
12.7mm o.d.
T1: 18 turns #22 B&S on FT50-43 core with 2 turn link.
T2,T3: 11 loops #24 B&S trifilar (0.5mm) on FT50-43 core.
T4, T5: 10 loops #22 bifilar on FT50-43 core.
L3 : 20 turns #22 B&S on T50-2, 4 turn link.
L4 : 13 turns #22 B&S on T50-6, 4 turn link.
L5-7 : 20 turns #22 B&S on T50-2.
L8-10 : 13 turns #22 B&S on T50-2.
L11-13 : 8 turns #20 B&S (0.81mm) on T50-6.
All ordinary diodes 1N914 or 1N4148.
FB101-43 bead.
MTP4N08, IRF 510.
Ant. c/o relay
+Vdc ~=Vrf measured at 7MHz operation, Tx mode.
3-Band 'Multiplier' Transmitter.
VK3XU 4-91

Something in the Air?

Packet radio users in New South Wales may hear some strange signals on two metres over the next few months.

Gareth VK2ANF is doing some experiments sending data to and from light aircraft, starting with ground to ground, then air to ground, and finally air to air.

The aircraft will *not* accept connects, and will beacon periodically. Initial testing will be done on a quiet frequency away from other traffic, but later a busy packet channel will be used to simulate congestion.

Amateur stations not participating in the experiment are asked to ignore the signals from VK2ANF. If a popular packet channel is being used, please feel free to send packets while the aircraft are beaconing — this will be important in evaluating the data integrity.

The aircraft will be flown by pilots who are also amateurs, their callsigns to be advised. However, in the final demonstration phase of the experiment, aircraft callsigns may be used, DoTC approval pending, of course.

If you would like more information, please contact Gareth VK2ANF at PO Box 1367, Dee Why NSW 2099. **ar**

QTC (I Have a Message For You)

It has been brought to our attention that copies of this book which was reviewed by Ian Crompton VK5KIC in the July issue of this magazine are available from Alec Sandilands, 10 Nelligen Place, Nelligen NSW 2536, at a cost of $A17.00 hardcover or $A10.85 paperback (postage and packing inc). Suggest you contact Alec with any queries. **ar**

100ohm, 1/4W	R5
470ohm, 1/4W	R6, 18, 29
390ohm, 1/2W	R25
500ohm miniature flat mount trimpot	R11, 15
5kohm miniature flat mount trimpot	R23
1kohm, 1/4W	R2
1.5ohm, 1/4W	R19, 28
2.7ohm, 1/4W	R1
4.7ohm, 1/4W	R13 17
10ohm, 1/4W	RI0, 14, 26, 27
100ohm, 1/4W	R3, 4
220ohm, 1/4W	R7
100kohm linear pot	R8

Semiconductors

MPF102, 2N5457 etc	Q2
MFE131, 40673 etc	Q3
2N222, 2N3904 etc	Q1
2N3638, 2N3906 etc	Q10
2N3053, BFY50 etc	Q4, 5, 6, 7, 8
MTP4N08, IRF510 etc,	Q9
1N4148, 1N914	D1, 3, 4
6.2V/400mW zener	D2
5.1V/400mW zener	D5
1A/400V diode	D6, 8, 9, 10, 11
LED	D7
LM7812, 12V/1A pos regulator	U1

Inductive Components

1 or 2.2 or 2.5mH RFC	L2
Amidon FT50-43 toroidal core	T1, T2, T3, T4, T5
Amidon T50-2 toroidal core	L3, L5, L6, L7, L8, L9, L10
Amidon T50-6 toroidal core	L4, L11, L12, L13
Amidon FB101-43 bead	G2 of Q3
Transformer, 15V/1A	T6

ar

Australian Radio and Radar Publications

COLIN MACKINNON VK2DYM, 52 MILLS ROAD, GLENHAVEN 2156

There have been a number of books published over the years which deal with the history and technical development of radio and radar in Australia. Most were printed in limited numbers and are sometimes hard to find. So that interested readers and researchers may know what each contains, this column will give brief details of those publications known to me. In general terms the books selected contain historical or technical details of Australian amateur radio, commercial or military radio and radar, and I do not include publications dealing only with radio or TV programs and broadcast personalities.

I am not covering trade technical booklets like the AWA and Philips publications, nor at this stage do I intend to list communications and radar equipment. I may do that later if there is sufficient interest. If anyone can add to my list, I would appreciate details so I can include them in the catalogue. **ar**

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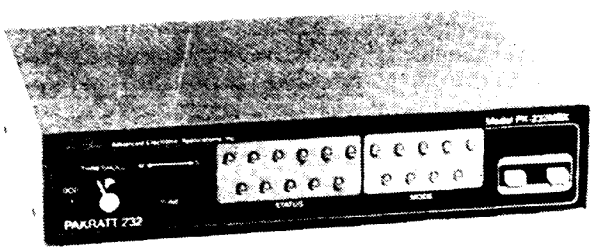

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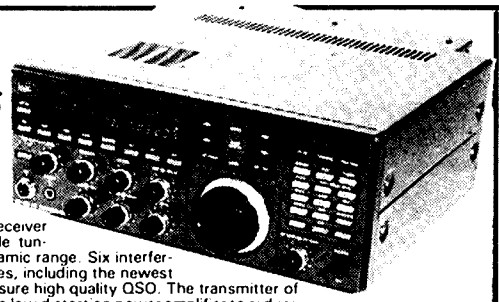

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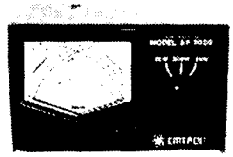

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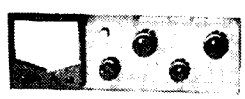

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A SMALL HELICAL ANTENNA FOR TWO METRES

IAN GLANVILLE VK3AQU
6 LEGGIO RD,
MYRTLEFORD 3737

AS I APPROACHED THE finishing stages of a home brew 2m FM transceiver I decided that a rubber ducky or similar sized antenna would finish off the project just nicely. Having built helical antennas for HF I decided to apply the same principles to VHF. That is, when a half wave length of wire is wound in this fashion it produces an electrical quarter wave antenna. What I came up with was an antenna measuring just 210mm long (8-1/4") plus BNC connector.

Construction

For the former I used 210mm of polyethylene from an old piece of 100ohm coax. This has a diameter of 7mm. Remove the sheath, braid and inner conductor. Using a Stanley knife, shape one end to fit the BNC coax connector. Next, drill a 1mm hole at an angle toward the bottom to allow the wire through to the cavity left by the inner conductor and out to the connector. Using some coax braid, form a solid tip of 12mm on the top end. Tin it to keep it in place.

Now take one metre of No 24 gauge wire and wind as per figure 1. This length may well prove to be too long, but use all the wire. You can trim it up later.

Solder one end to the braided coax at the top and the other end pass out through the hole you drilled near the bottom and fit the centrepiece from the BNC connector.

Now comes time to test it. Using a BNC female connector, solder four radials of 500mm at 90-degree intervals to form the ground plane, and attach this to a test mast in a clear location. At the bottom of the female connector, solder a short loop of two turns. Connect the antenna and couple a dipper to it and check for resonance. The frequency should be below 146MHz. To achieve resonance, trim wire from the bottom until the dipper indicates resonance at the desired frequency, say 146.50MHz. Now replace the two-turn loop by a short piece of 52ohm coax. Try to get the SWR meter as close as possible to the antenna. Check the SWR (identify your transmissions and use low power in an unused portion of the band, please). The SWR will probably be quite high. Try shifting the wire around, altering the turns spacing. The figure is an indication of how mine finished up and can be used as a guide. When you get the SWR as low as you can (in my case this was still above 2:1) bend the radials down. All being well, the SWR will drop to an acceptable level. I further tested mine mounted on the printed circuit board case of my home-brew hand-held. It was nice to know it presented a low SWR to the device to which it will be finally connected. Finish off by glueing the former to the BNC connector and covering the antenna with some heat-shrink tubing.

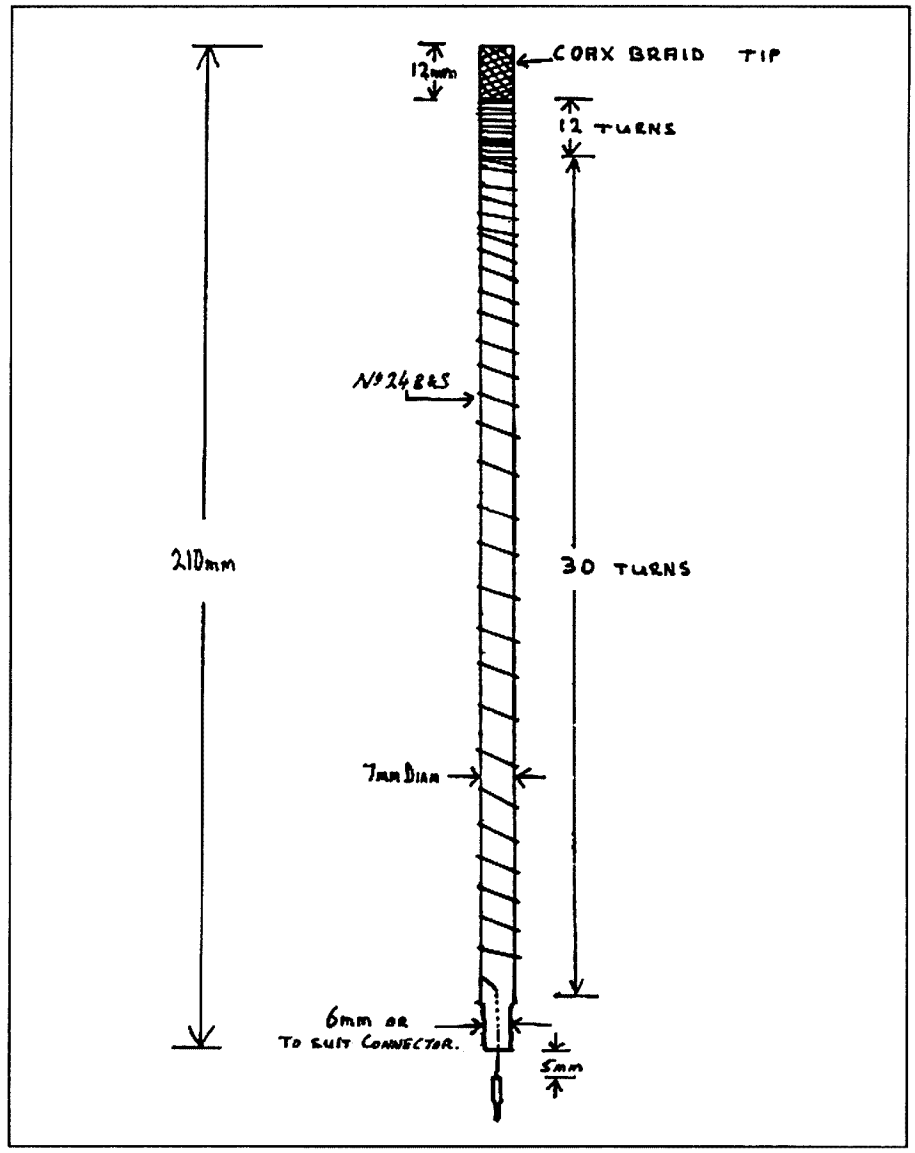


Figure 1: Two-metre helical

So, there you have it. A small and effective helical antenna. Perhaps you may like to now try one for HF.

References

Radio Communication July 1974
ARRL Antenna Handbook

ar

QUAD LOOP FOR HF USE

OR GIVE ME A HOME AMONGST THE GUM TREES!

ADRIAN FELL VK2DZF
PO BOX 344, BAULKHAM HILLS 2153

THE QUAD LOOP THAT is described in this article has been in operation on my QTH for the past four years. For me, that's saying something, as my experimental nature often makes for many changes. This loop hasn't moved!

Owners of quad or delta type loop antennas will need no further introduction to this excellent antenna. Those of you who have not tried a full wave loop antenna should at least find this article interesting; maybe it may provoke more incentive to give it a try.

Although a full wavelength long loop of wire can often present to the constructor more problems than a dipole, the extra will be worth it at the end of the day because the quad loop is a superb antenna. Not only does this loop provide your signal with some extra oomph, it makes an excellent receive antenna, being lower on QRN pick-up and a good signal-to-noise ratio is presented to your receiver.

Those amateurs who want a high performance antenna that fits somewhere in between a G5RV and a TH6DXX should look no further than the quad.

Construction Method

There are many, many ways to construct a quad loop; this is only one of them. I have made full use of two 70' gum trees located in my suburban block of land.

The idea of not using spreaders not only saves expense, but makes for a less visible antenna, thereby keeping the neighbours happy.

The overall arrangement is shown in detail in Figure 1.

The matching method I chose to use was the gamma wire with a series tuning capacitor to tune out reactance; this arrangement works extremely well in practice and, because this arrangement of matching assures minimal (if any) radiation of RF from the coaxial cable, low TVI is guaranteed. This is important when one lives in suburbia.

Wire size is optional, but a good fairly heavy gauge multi-strand type (such as earth wire) is recommended for the set-up in Fig 1.

Wire size, construction methods and

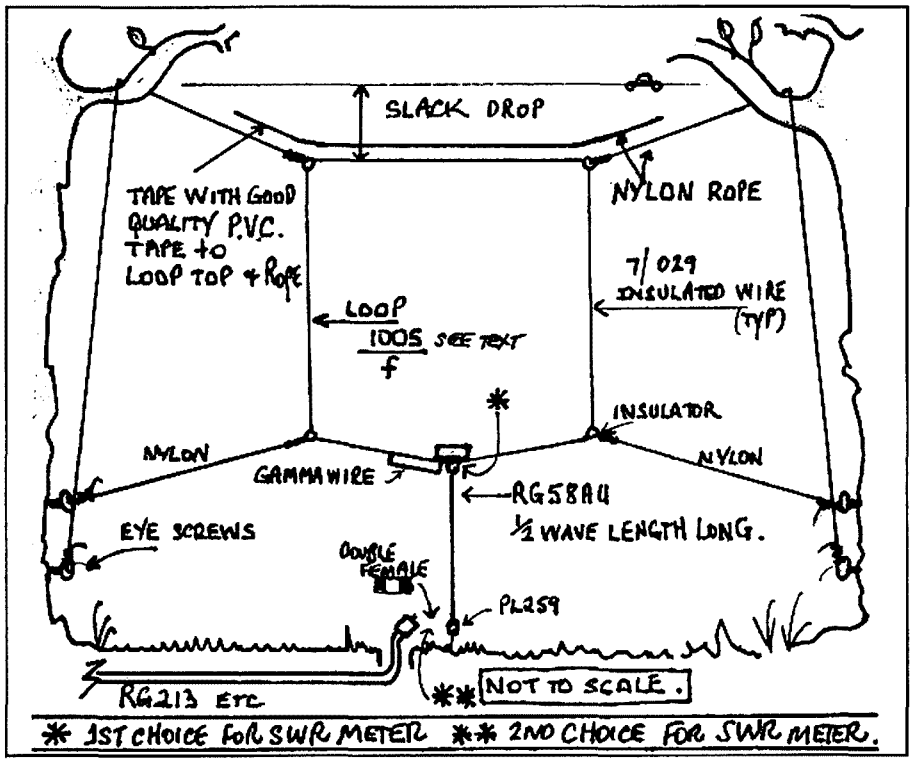


Figure 1

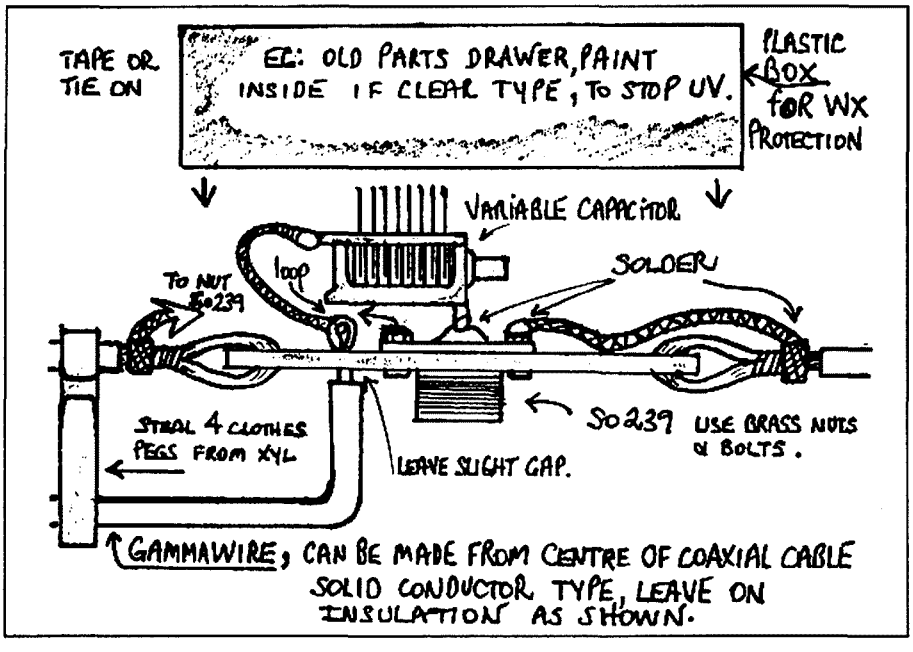


Figure 2

height of the loop above ground will affect the exact resonant point of the loop, but as this loop is very broad (large bandwidth) the formula 1005/f(MHz) should assure a very close result.

One can use the VSWR readings to determine where resonance occurs and make use of a GDO or noise bridge. Other arrangements such as tuning stubs could be used and, if further information on the various methods available are required, the reader should refer to *Handbook on Cubical Quad Antennas* by William I Orr and Stuart D Cowan.

The details for a starting point for tuning are given in Fig 3, and in my case (20m quad loop) the distance "L" had to be increased somewhat to obtain a very low VSWR reading.

Adjusting tuning capacitor "C" along with distance "L" should achieve a very low, if not perfect, VSWR of 1:1. By checking the bandwidth and seeing the extremes, resonance will be found. The loop size may have to be made smaller or larger, so allow for this during construction.

It seems a bit time-consuming, doesn't it, but it's worth the effort.

Don't worry if you don't get the VSWR down to 1:1, the loop will still work like a charm.

The SWR meter should ideally be inserted at the point * (marked in Fig 1) or, if that is too difficult, you can make a 1:1 transformer by using a half wavelength of RG58AU coaxial cable. This will allow for checking and adjusting the SWR at ground level. RG58AU is used because it is much lighter in weight, thereby not pulling the square out of shape too much.

Figure 2 shows the method I used to construct the centrepoint and gamma construction, and if you don't wish to use a variable capacitor this could be changed with a fixed type, or a piece of coaxial cable can act as a good capacitor.

If you have a digital capacitance meter, you could substitute as suggested above.

Allow for wires to flex, and insulate the wire going from the capacitor to the gamma line. RG58AU (shield only) makes for a good flexible connecting wire, and all should be self-explanatory from the drawing in Fig 2.

Don't forget the weather protection box to cover all the doings; paint it if it's clean — helps keep out the UV rays.

Don't use bright colours; some birds like to eat and pick at different colours. Green might be worth trying.

Getting the Loop in the Air

If two trees are used as in Fig 1, the method I used to get the nylon cord over the branches was first to catapult a lead shot connected to a light fishing line over the desired branch. This should then fall back to ground level.

The fishing line is then joined to plumb-line type cord and pulled over the branch by the fishing line, once the plumb-line is over and down. This is then used to pull over the final thick nylon rope. If you are a "good shot" with a catapult, the whole exercise will be quite easy and, after a few years, you will become an expert!

My loop is about 45' high to the top, leaving the bottom of the quad loop about 27' off the ground, well clear of everything.

The RG58U can then be pulled to one tree when the antenna is not in use, leaving the ground level clear. Now it looks like a "normal" back-yard again.

If a slack level is left at the top of the loop as in Fig 1, the trees can move around in the wind *without* the nylon cord rubbing on the branch.

One could of course use pulleys and weights, but I have found that method is not necessary. Don't tie cords around trees; you could ringbark the tree. Better to use screw eyelets (or similar), it will not harm the tree that way. I used egg-type insulators at the corners. I then secured them with stiff wire, put there on the loop first.

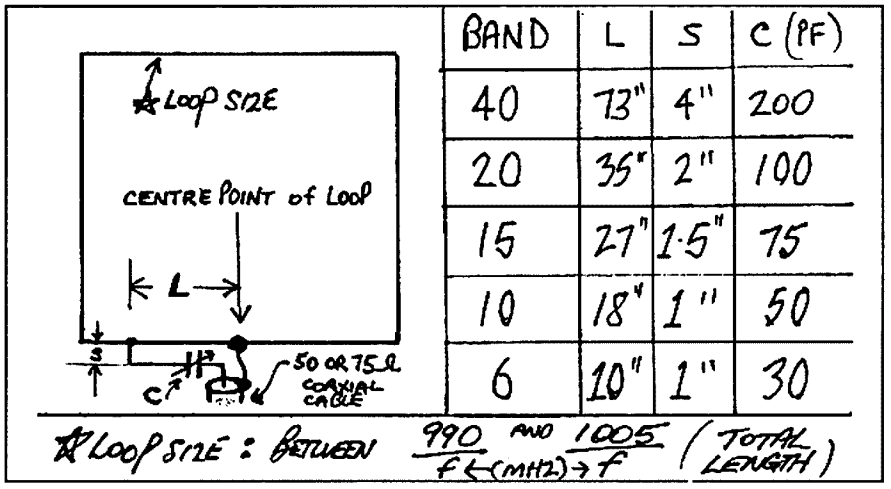
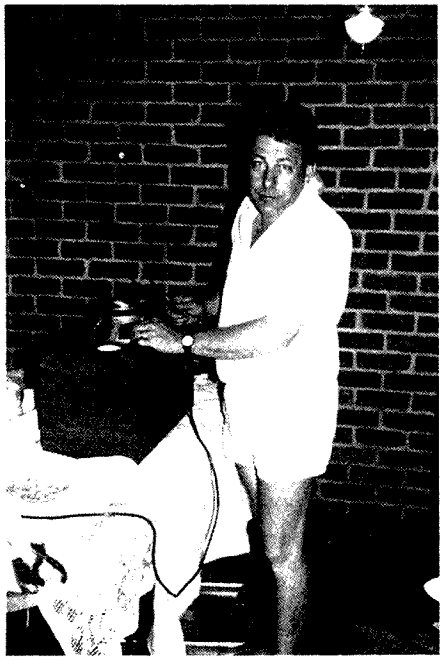
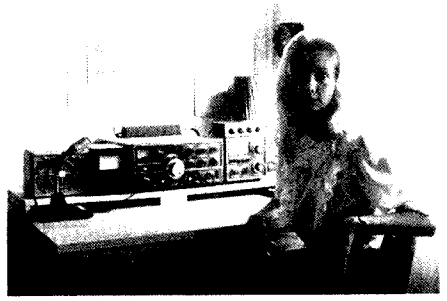


Figure 3



Adrian VK2DZF at his other hobby — hi-fi.



Judi VK2ELF works CW only. The Fell couple have four children. Judi won the CW section of the RD contest in 1984.

Performance

The quad loop will transmit (and receive) its strongest signals at right angles to the loop. Looking at Fig 1, this would be in and out of the page.

My two trees have determined the direction of our loop to point in a NE/SW direction; this is towards the USA, both long and short path.

This will put out transmitted signal at a 2-3 S-point disadvantage towards Europe, because the sides of the loop face this direction.

In practice, this doesn't come to many problems, except for one unavoidable fact of life for 20 metres: "QRM". It's often very hard for European stations to copy a S-5 signal if they are experiencing heavy QRM. So, to maximise the signal strength, point the loop in your favourite direction, but don't worry too much if you can't; it still will work quite well.

Another way to overcome this problem is to use two loops at right angles to each other (see article by VK4FUQ *AR* March 1991). Our average signal reports (on CW) to the east coast of the USA are S-7, rarely below S-5, sometimes S-9. Working phone, I have received S9 reports to the USA (and even Spain) using an old TS520-S. I'm not worried about signals being down a bit in the direction of the sides of the loop as I switch over to my Z-match—Multi-band inverted V antenna, which works very well on 20 metres—in the direction of the major lobes. The loop also works extremely well for local (VK-ZL) stations as well.

In conclusion, a fixed (non-rotated) quad loop does have some weak spots, but these are (relatively speaking) very minor compared with the overall performance, which is excellent. Give the quad loop a try.

Other Options

Feeding the quad loop with a gamma match and coaxial cable is not the only method available. Balanced open wire feeders with a Z-match coupler would be another excellent method. There are plenty of options open for feeding arrangements; pick one that suits your own requirements if the gamma doesn't suit. A quad loop can be used as an excellent multi-band antenna, and suggested further reading on this subject is available from RSGB publications.

I shall be investigating the capabilities myself of multi-banding the quad loop in conjunction with the mighty Z-match coupler. No doubt it will work, but I am still reluctant to take down the gamma quad loop.

Good luck, 73, Adrian Fell VK2DZF

References

RSGB Handbook & Antenna Books
ARRL Handbook & Antenna Books
All About Cubical Quad Antennas
William Orr; Stuart Cowan
AR March 1991, by Felix Scerri
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GETTING STARTED WITH AMATEUR RADIO SATELLITES

(PART 10)

BILL MAGNUSSON VK3JT, 359 WILLIAMSTOWN RD, YARRAVILLE 3013

(Concluded from previous issue with editorial apologies to Bill for having to interrupt his train of thought!)

Range calculations also have another important spin-off. The rate of change in respect to time at the observer's location is a measure of how quickly the satellite is moving towards or away from the observer. This can be resolved into a factor which can be applied to the beacon and transponder frequencies to give a printout of doppler shift.

This is why some programs require the user to enter the beacon frequencies. Remember, however, this is only a one-way doppler calculation and is of use only when communicating directly with a satellite. It does not take into account a signal being relayed through an orbiting transponder. This is a much more difficult problem as it involves two different rates of change relative to two separate locations.

That's not the end of it. There are many more things that can be worked out from the kep elements. Satellite orbital speed, orbit period and equator crossing increment to name a few. Some are important, some not. The time of next rise and set. Visibility time in minutes. Footprint coverage. Mutual communication windows. A program could be made to print out all these and more. Somewhere you have to draw the line.

The Karl Meinzer pocket computer program, for example, prints out only elevation, azimuth and mean anomaly. It can be extended to include range, height and the sub-satellite co-ordinates, but this slows it down.

The speed of calculations is of virtually no importance to a modern fast computer. It'll work faster than you can read or your printer can print. But not everyone has an IBM486. My old BBC computer runs in Basic at 1MHz and every extra thing you ask it to do takes more time. I try to bypass as many unnecessary calculations as possible to speed things up.

Now I'm not suggesting you go out and learn programming so you can get into your software and speed it up. Most modern software is written in machine language and is probably running as fast as possible anyway.

The purpose of this final article in the series has been to de-mystify the goings on inside your computer. I hope it's gone some way towards doing that without becoming too complicated.

In fact, I hope this whole series has gone a long way towards doing that for newcomers to the exciting subject of amateur satellites. Go for it; keep learning and enjoy.

ar

TRY THIS

Survival Radio

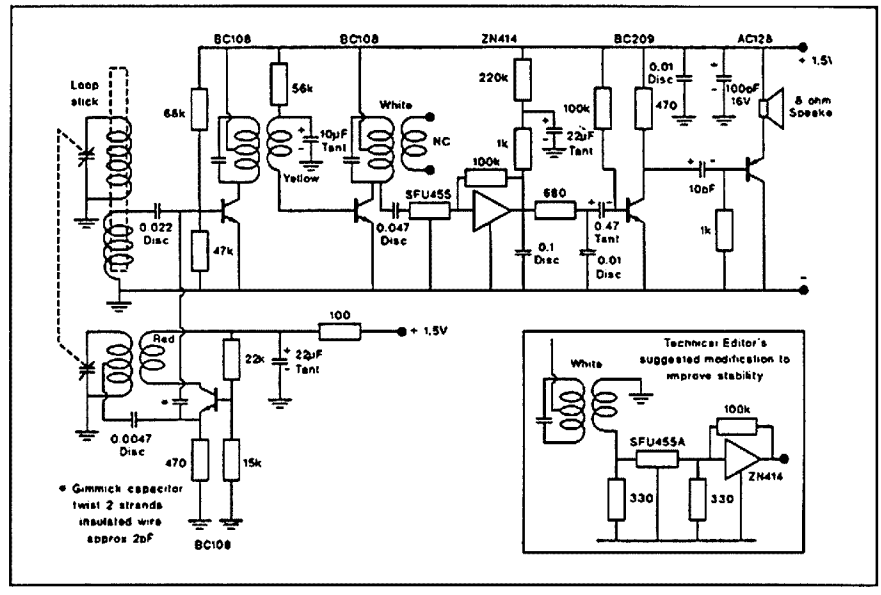
I have always been interested in low voltage equipment, and although I have come across commercial receivers which work from a three-volt supply, and even a 1.5-volt supply using germanium transistors (hard to come by these days), I have never seen a circuit using mostly silicon transistors and off-the-shelf components.

The results obtained using a 1.5-volt battery supply (one D Cell) were encouraging and it also worked reasonably well using solar cells.

Solar cells of approximately 0.45 volts are obtainable from one supplier, but the price is a bit high. If sufficient interest is shown, I feel sure a number of suppliers could make this item available.

A set of IFs is available from different suppliers, but the set I bought had two second IFs (both white top) and one third IF (black top), one oscillator coil (red top), but no first IF (yellow top).

I used them anyway, but if you can obtain the correct set of coils it would be better.



J A HEATH VK2DVH
LOT 26 REMEMBRANCE DRIVE
TAHMOOR 2573

ar

"NOT A HIGH TECH" HEADING FINDER

BRYAN BAILEY VK5BFB
44 CHARLBURY RD, MEDINDIE GARDENS 5081

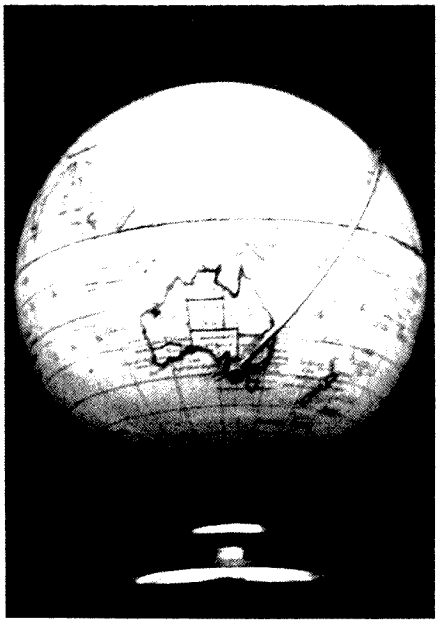
THE SUBJECT OF THIS article is an old idea revisited. It was passed to me by Tony VK5JG and was, in fact, made by him and slightly modified by me.

A school earth globe is modified by removing the mounting and arc and remounting the globe on its south pole. The builder can use his/her initiative here. The mount can be wood or anything suitable from the junk box. I used a pulley from a Hoover washer. It is important that the "neck" joining the mounting to the globe be as thin as possible in order that the maximum sweep of the cursor be obtained.

This "cursor" arc which sweeps the globe and gives the actual heading is made up of stiff wire, brazing rod etc, one end of which pivots on your QTH and the other on the Antipodean point — the point 180 degrees from your QTH as listed below.

Pivots are formed at each end, by either bending or soldering suitable fittings from the junk box. Mine has contact blocks from a bayonet light socket.

If the globe does not have longitude and latitude marked, the points can be located on a map and transferred to the globe. Care is needed here to ensure the points are accurately marked before drilling holes. Fit the cursor and you now have a useful aid in finding short path headings which is used by positioning it so your QTH faces south, running the cursor to your signal destination and turning your beam accordingly.



Picture of finished heading finder

In this form, the unit gives short path headings, using an "Armstrong" rotator. Long paths can be indicated by an extension of the cursor on the QTH end and, if required, a degree scale can be easily added.

This unit is well worth making and is a good talking point. Signal paths can be quite a surprise to the uninitiated.

Antipodean points for QTHs around Australia are:

Adelaide	34.55N	41.60W
Alice Springs	23.40N	46.50W
Brisbane	27.28N	27.00W
Darwin	12.24N	49.50W
Hobart	42.50N	32.,80W
Melbourne	37.50N	35.40W
Perth	31.57N	64.50W
Sydney	33.50N	29.00W

(Other antipodean points may be calculated thus:

Latitude: same as QTH, but in northern hemisphere.

Longitude: 180 — QTH's long; result is longitude west of Greenwich — Ed).

ar

Technical Correspondence

More About Modulation

VK5BR's Modulation & Modes brought us all up to date. However, the treatment of AM did miss many points, apart from the excellent bit on vestigial AM for TV. It left no clues at all as to why it is still used! A version of vestigial AM was, may still be, used at up to 500kW by the American SW broadcasting system. The technology was to amplify the carrier, including a component of the original DSB, and one sideband in separate amplifiers and combine them at the antenna input.

Why is it used? Well, AM puts the smallest demands on receiver technology and stability, a critical point in certain areas of manufacture and use, also in situations like navigational beacons, aircraft communications and distress facilities on boats. It is the only system that allows simultaneous auto or manual DF whilst passing a message or simply monitoring the heading of a craft. Make a one-watter to talk to your mate on one of the vacant kHz on 10 whilst you monitor for DX! A 100W SSB with only 20dB carrier suppression puts out a 1W carrier!

There is, of course, controlled carrier; you monitor the audio and transmit only enough carrier for de-modulation of the SSB or DSB. A lot easier now with audio-controlled AVC. Reduced carrier or super modulation (our licences permit it) where the received carrier has to be emphasised at the receiver to an adequate level to de-modulate the sideband/s. Selective fading is a problem at times with any form of AM. I see no reason why an old technique used for high speed (120wpm) Morse cannot be used. This used about 8Hz audio to deviate the carrier 16Hz. Drop-outs were infrequent, and signals could be used with lower S/N ratios. With restricted openings to the UK, this was important. I have used and built this system on CW, but had not thought to apply it to AM where it would be effective. The 8Hz beat would not be noticeable. Shared channel AM BC stations find an 8Hz carrier off-set excellent.

FSK can be used effectively at hand speeds and the RX signal used to "key" a local audio oscillator; QRN/QRM holds the sig on or off. This mode is quite nice on ordinary CW.

Robert R McGregor VK3XZ
2 Wiltshire Drive, Somerville 3912 ar

MINI EQUIPMENT REVIEW

THE YAESU MD-1C8 DELUXE DESK MICROPHONE

RON FISHER VK3OM

THERE IS NOTHING LIKE an elegant desk microphone to add a bit of class to the shack. Not only does it add class to the general appearance, it usually adds a bit of class to the sound of the transceiver as well. The Yaesu MD-1C8 will do both in a big way. Dick Smith was kind enough to supply one with the FT-990 transceiver we reviewed recently, and I thought that really the microphone deserved a review of its own.

Let's have a quick look at the specifications. It has a basic impedance of 600 ohms and an overall response from 100Hz to 15kHz at the -6dB points. This puts it almost in the "broadcast" category. The directivity pattern is undirectional, which means it has very little pick-up from the back. This is very useful property to reduce room echo, especially when speech processing is used. A three-position switch mounted under the desk stand provides two positions of selectable bass cut. You can select either full range, -5 and -10dB cut at 100Hz.

The base section has a PTT bar with a second section for PTT lock. Up/down buttons are conveniently positioned on the base with a "fast" button in between.

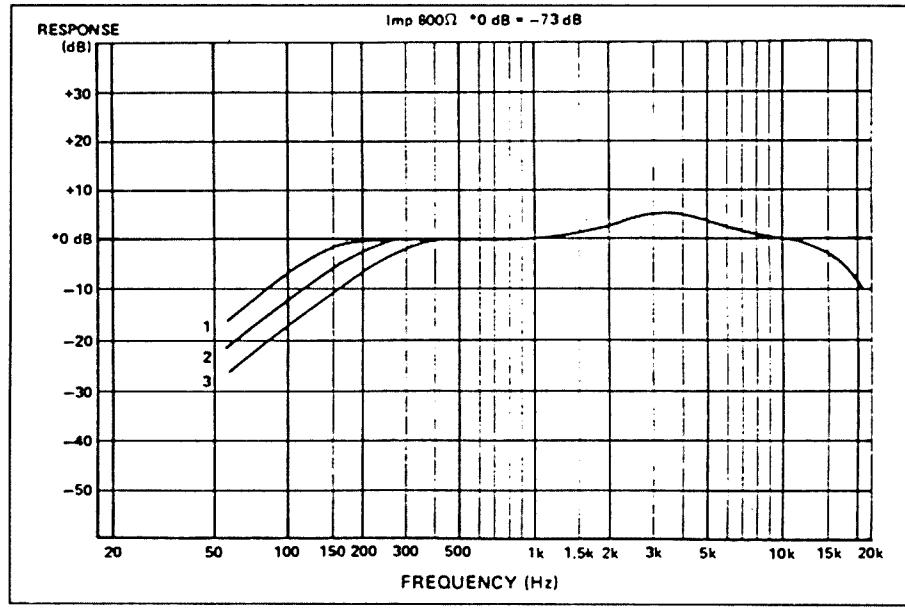
You can even use the microphone as a handheld with a PTT switch provided on the mike itself.

The Yaesu MD-1C8 On The Air

The microphone was tried on three different transceivers. In each case, the reports were very flattering, with marked improvement over the standard hand microphones. With the directional response, I found I could get back much further from the microphone without producing any noticeable room echo. In general, DX contacts preferred the bass cut switch in the third or maximum cut position, while locals liked the full bass response. It's interesting to note that while the specification rates the cut as -5 and -10dB at 100Hz, the curve supplied shows this to actually be about -12 and -18dB. This appears to be met in practice. No doubt they forgot to take into account the fact that the normal response is down 6dB at 100Hz.

The microphone comes wired to an eight-pin connector to suit Yaesu equipment. It would not be too difficult to change this to suit other makes. The MD-1C8 is priced at $169.

Our thanks to Dick Smith Electronics for the loan of our review microphone.



Frequency Response Curve of the MD-1C8

Yaesu MD-1C8 microphone ar

UK Novices on the Air

As reported in the RSGB DX News Sheet, the ***first UK Novice Licence*** was issued in the last week of July this year.

Hugh McNeil, 13-year-old school student with the callsign 2E0AAA was reported operating on 28472kHz around 1100 UTC on Friday 26 July.

As far as the HF bands are concerned, UK novices are authorised to use the following frequencies/modes: (kHz) 1950-2000: CW/phone/RTTY/data; 3565-3585: CW; 10130-10140; CW; 21100-21149: 28100-29190 and 28225-28300: CW/RTTY/data; 28300-28500: CW/phone; 50620-50760 data; 51250-51750: CW/phone/data (phone: means any type of speech modulation - SSB, AM, FM etc.

Callsign prefixes are: England 2E, Scotland 2M, Wales 2W, Isle of Man 2D, Jersey 2G, Guernsey 2U, Northern Ireland 2I, in all cases followed by the number 0, 2, 3 or 4 and three letters.

STEPHEN PALL VK2PS

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Product Review

MORSE PROGRAM COMPARISON

CODEMASTER 4.0 AND VK1 DIV (VK1PJ)

GRAHAM THORNTON VK3IY

Feature	Codemaster 4.0	VK1 Div (VK1PJ) Ver 5
Hardware Requirements	IBM PC or Compatible 192kb Dos 2.10 or later, or any 80-2 /3/486, PC or MSDOS 2.10 to 5.0	IBM XT/AT, Wang APC, Sanyo 550/555 & Commodore PC (Not C64); any IBM clone. <200k RAM
Morse speed range (wpm)	5.5-40	1-100
Hard copy to printer	No	Yes
Output from serial/ parallel ports	Not stated	Yes
Morse from ASCII files	Yes	Yes
Instant Morse echo from keyboardx	Yes	No
Keyboard entry for text	Only via other program	Part of package supplied
Text editing facility	Only via other program	Part of package supplied
Random cipher generator	Choice of group length. Contents letters or figures or both	Groups of 5 characters only; mixed letters and figures only
Saving of random group groups to disk for subsequent hard copy	No	Yes
Adjustable non-ITU spacing between characters and words	Yes	Yes
Exit option from current Morse	Yes	Yes
Pause and resume option	No	Yes
Structured learning program	Yes	No
Difficult plain language words in random order	Yes	No
Short frequently used "speed" words in random order	Yes	No
Speed error correction facility	Only by proportional selection of different Morse speed	Direct compensation of timing error
Print text from screen	Yes	Yes
Morse prosigns	Yes	Yes
Morse sending checker	No	No
Audio tone selection	Yes	Yes
Optional pre-transmission test tone	No	Yes
Operating handbook supplied	Yes	No, but can be printed from program
Price	$39.95	$5

The review copy of Codemaster 4.0 allowed only initial activation of the menu. Any attempt to change options or sending parameters resulted in a fault condition. It was necessary to re-load the program and re-set the parameters each time another option was desired. An IBM XT was used for the tests.

The following feedback has been received from Milestone Technologies Pty Ltd, supplier of Codemaster, after reading the above:

The reported "bug" has now been rectified. Some of the factors compared are of little importance. It is unreasonable to compare a Morse training package with a Morse practice generator.

We'll leave it to you, the reader, to decide these questions for yourself. Milestone Technologies' address is PO Box 699, Mt Waverley 3149, phone (03) 807 6767. The address of the VK1 Division is given on page 3 of this issue.

WIA Divisional Bookshops

The following items are available from your Division's Bookshop (see the WIA Division Directory on page 3 for the address of your Division

	Ref	Price to Members
ANTENNA BOOKS		
Ant. Compendium Vol 2 Software only	8X293	$18.00
Antenna Compendium Vol 1 ARRL	8X163	$19.80
Antenna Compendium Vol 2 & Software ARRL	8X294	$32.40
Antenna Compendium Vol 2 ARRL	6X292	$21.60
Antenna Handbook - Orr - 1988	8X217	$15.60
Antenna Impedance Matching - ARRL - 1989	BX257	$27.00
Antenna Note Book W1FB - ARRL - 1967	BX179	$18.00
Antenna Pattern Worksheets Pkt of 10 - ARRL	BX211	$5.40
Antennas 2nd ed John Kraus - 1988	BX259	$93.60
Beam Antenna Handbook - New ED. 1990 Orr	BX215	$17.40
Cubical Quad Antennas - Orr	BX214	$13.10
HF Antennas - Moxon RSGB - 1988	BX188	$27.00
Novice Antenna Notebook DeMaw - ARRL	BX162	$14.40
Practical Wire Antennas - RSGB	BX296	$25.20
Reflections - Software 5in disk	BX358	$18.00
Reflections - Transmission lines The Book - ARRL - 1990	BX348	$38.00
Smith Chart Expanded Scale PK of 10	BX903	$5.90
Smith Charts S/Scale 1 Set co-ord Imp/Admir Pack of 10	BX900	$6.10
Smith Charts Stand Scale 1 SET Co-or. PK of 10	BX900	$5.90
The Antenna Handbook - ARRL1991 edition	BX370	$36.00
The Truth About CB Antennas - Orr	BX219	$15.60
Transmission Line Transformers - ARRL 2nd edition	BX329	$36.00
Vertical Antenna Handbook - Lee - 1990	BX284	$18.70
Vertical Antennas - Orr - 1988	BX220	$14.30
Yagi Antenna Design - ARRL - 1988	BX164	$27.00
ATV BOOKS		
The ATV Compendium - BATC	BX270	$14.20
The Best Of CQ-TV - BATC	BX273	$15.80
CALL BOOKS		
Radio Call Book International	6X339	$57.80
Radio Call Book North America	BX338	$57.80
FICTION		
CQ Brings Danger - ARRL	BX206	$9.40
CQ Ghost Ship - ARRL	8X204	$9.40
Death Valley QTH - ARRL	BX205	$9.40
Grand Canyon QSO - ARRL	8X207	$9.40
Murder By QRM - ARRL	BX206	$9.40
SOS At Midnight - ARRL	8X209	$9.40
HANDBOOOKS		
1991 ARRL Handbook	BX337	$47.80
Electronics Data Book - ARRL - 1988	BX201	$21.60
Motorola RF Device Data - 2 Volumes	BX047	$22.10
Radio Communication Handbook - RSGB	BX266	$50.40
Radio Data Reference Book - RSGB - 1985	BX189	$32.40
Radio Handbook 23rd edition - Bill Orr	BX224	$53.90
Radio Theory For Amateur Operators - Swainston - 1991	BX265	$38.70
HISTORY		
200 Meters and Down 1938 - ARRL	BX196	$7.20
50 Years of the ARRL - 1981	BX196	$7.20
Big Ear - Autobiography Of John Kraus W8JK - 1976	BX363	$11.30
Golden Classics of Yesterday - Ingram	MFJ30	$18.50
Spark to Space - ARRL 75th Anniversary - 1990	BX310	$38.00
INTERFERENCE BOOKS		
Interference Handbook - Nelson - 1969	BX181	$16.00
Radio Frequency Interference - ARRL	BX186	$8.60
MISCELLANEOUS		
Amidon Ferrite Complete Data Book	BX044	$5.90
Design Notebook W1FR - ARRL	8X357	$18.00
Help For New Hams DeMaw - ARRL	BX308	$18.00
Hints and Kinks 12th edition - ARRL	BX330	$14.40
Novice Notes, The Book - ARRL QST	BX296	$10.80
QRP Classics - ARRL QST	BX323	$21.60
QRP Note Book - DeMaw ARRL	BX170	$10.80
Radio Astronomy 2nd edition - John D Kraus	BX262	$71.90
Shortwave Receivers Past and Present	BX253	$15.80
Sokd State Design - DeMaw ARRL	BX171	$21.80
MORSE CODE		
Advanced Morse *Tutor* - 3.5 Inch Disk	BX328	$36.00
Advanced Morse Tutor - 5.25 Inch Disk	BX328	$36.00
Morse Code 2 Tapes Novice Code Course - Gordon West	BX228	$17.90
Morse Code 6 Tapes 13-20 WPM Code Course - Gordon West	BX231	$63.90
Morse Code 6 Tapes 5-13 WPM Code Course - Gordon West	BX230	$63.90
Morse Code 6 Tapes Novice Code Course - Gordon West	BX229	$63.90

	Ref	Price to Members
MORSE CODE (Contd)		
Morse Code Tapes Set 1: 5-10 WPM - ARRL	BX331	$18.70
Morse Code Tapes Set 2: 10-15 WPM - ARRL	BX332	$18.70
Morse Code Tapes Set 3: 15-22 WPM - ARRL	BX333	$18.70
Morse Code Tapes Sal 4: 13-14 WPM - ARRL	BX334	$18.70
Morse Tutor 5.25 Inch IBM Disk	BX187	$18.70
OPERATING		
Amateur Radio Awards Book - RSGB	BX297	$27.00
DXCC Companion	BX345	$10.80
Low Band DXing - John Devoldere	BX195	$18.00
Maidenhead Locator-Grid Atlas - ARRL	BX197	$9.00
Operating Manual - ARRL - 1990 3rd Edition	BX192	$27.00
Operating Manual - RSGB - 1985 3rd Edition	BX359	$25.20
Passport to World Band Radio 1991	8X346	$30.80
Prefix Map - The World Flat on Heavy Paper	8X335	$14.40
Prefix Map of North America	BX235	$7.20
Prefix Map of The World	BX234	$7.20
Radio Amateurs World Map	BX236	$7.20
Short Wave Propagation Handbook	BX268	$16.70
The Complete DXer - Bob Locher - 1989	BX194	$18.00
Transmitter Hunting - TAB - 1987	BX222	$32.30
PACKET RADIO BOOKS		
AX.25 Link Layer Protocol - ARRL	BX178	$14.40
Computer Networking Con (Packet) No 5 1986 - ARRL	BX167	$18.00
Computer Networking Con (Packet) No 6 1987 - ARRL	BX166	$18.00
Computer Networking Con (Packet) No 7 1988 - ARRL	8X184	$22.50
Computer Networking Con (Packet) No 8 1989 - ARRL	BX296	$21.60
Computer Networking Con (Packet) No 9 1990 - ARRL	BX360	$21.60
Computer Networking Conf (Packet) 1-4 1982/5	8X166	$32.40
Gateway to Packet Radio 2nd edition - ARRL	BX169	$21.60
Packet Radio Made Easy - Rogers	MFJ32	$18.50
Packet Users Notebook - Rogers	BX285	$16.70
SATELLITE BOOKS		
Oscar Satellite Review - Ingram	MFJ31	$15.30
Satellits AMSAT-NA 5th Symposium 1987 - ARRL	BX182	$15.80
Satellite AMSAT-NA 6th Symposium - ARRL	BX199	$15.80
Satellite Anthology - ARRL	6X180	$14.40
Satellite Experimenters Handbook 1990 edition	BX177	$36.00
Space Almanac – ARRL – 1990	BX299	$36.00
Weather Satellite Handbook - ARRL	8X324	$36.00
Weather Satellite Handbook Software only - ARRL	BX326	$18.00
VHF/UHF/MICROWAVE		
All About VHF Amateur Radio - Orr - 1968	BX216	$15.80
Microwave Handbook Vol 1 - RSGB - 1989	8X318	$63.00
Microwave Update Con. 1967 - ARRL	8X174	$15.80
Microwave Update Con. 1968 - ARRL	BX183	$15.80
Microwave Update Con. 1969 - ARRL	BX321	$21.80
Mid Atlantic VHF Con. October 1987 - ARRL	6X175	$15.80
Spread Spectrum Source Book - ARRL - 1991	BX365	$36.00
UHF Compendium Part 1 & 2 Vol 1	BX250	$67.50
UHF Compendium Part 3 & 4 Vol 2	BX251	$67.50
UHF Compendium Part 5 German Only	BX354	$50.20
UHF/Microwave Experimenters Manual - ARRL - 1990	8X325	$40.50
UHF/Microwsve Experimenters Software 5 Inch Disk - ARRL	BX327	$18.00
VHF 21st Central States Con. 1987 - ARRL	BX172	$15.80
VHF 22nd Central States Con. 1988 - ARRL	BX173	$15.80
VHF 23rd Central States Con. 1969 - ARRL	BX266	$15.60
VHF 24th Central States Con. 1990 - ARRL	BX322	$21.60
VHF/UHF Manual - RSGB	BX267	$43.20
WIA MEMBERS SUNDRIES		
Log Book Covers		$16.00
WIA Badge - Diamond		$4.00
WIA Badge - Diamond With Call Sign Space		$4.00
WIA Badge - Traditional Blue		$4.00
WIA Badge - Traditional Red		$4.00
WIA Car Window Stickers		$0.50
WIA Tape - Sounds of Amateur Radio		$7.00
WIA PUBLICATIONS		
Australian Radio Amateur Call Book - 1992		$10.00
Band Plans Booklet		$2.80
WIA Log Book - Horizontal or Vertical Format		$5.00
WIA Novice Study Guide		$1.50

Not all items above are available from all Divisions (and none is available from the Executive Office).
If the item is carried by your Divisional Bookshop, but is not in stock, your order will be taken and filled as soon as practicable.
All prices are for WIA members only – postage and packing, if applicable, is extra.
All orders must be accompanied by a remittance.

REPORT ON IARU REGION III CONFERENCE BANDUNG — OCTOBER 1991

RON HENDERSON VK1RH

THE EIGHTH REGIONAL Conference of the IARU Region III Association was hosted by Organisasi Amatir Radio Indonesia (ORARI) in Bandung, Indonesia from 8 to 12 October 1991. The WIA was represented by Ron Henderson VK1RH IARU liaison officer, Kevin Olds VK1OK, Murray Kelly VK4AOK and Roger Harrison VK2ZTB. The WIA also held a proxy from the Solomon Islands Radio Society.

Travelling to Bandung

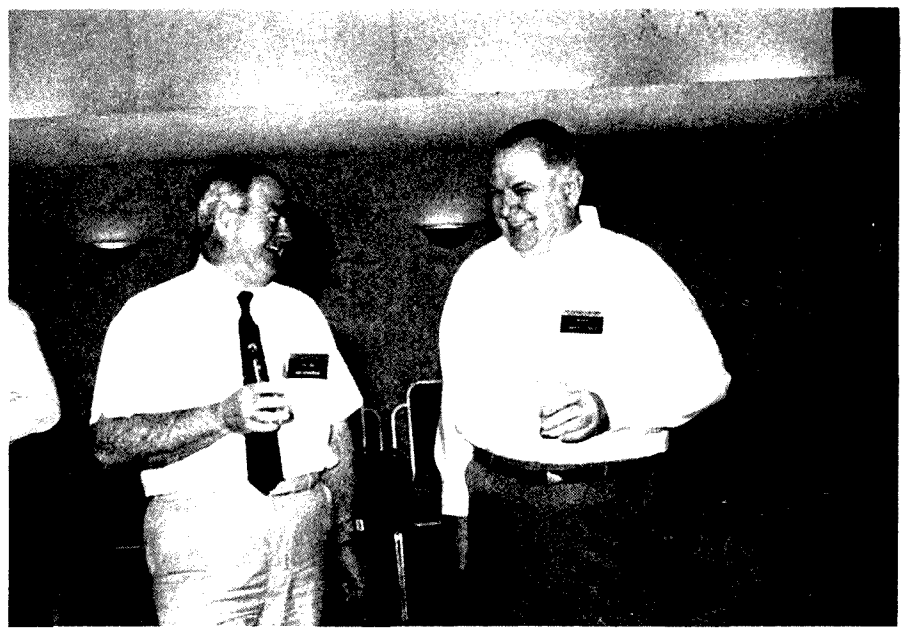
We travelled separately to the conference by air, being met at Jakarta by members of ORARI. They collected travellers from the airport, conveyed them to a hotel for a rest break then on to the railway station for a three-hour train trip to Bandung. This rest break allowed a wonderful opportunity to discuss amateur radio informally with other delegates and hear their interests and concerns before the conference proper started.

Conference Planning

On an initiative of the Directors all delegates, that is the leaders from each member society, met informally the night before the official opening to identify major issues, suggest possible committee and working party members, set the order of the agenda and identify a conference chairman. On this last point it has been the tradition for the host society to nominate a conference chairman to conduct the business meeting with support from the Association Secretary. ORARI nominated Sriwijaya or "Wid", YB0BNB, a GP who is also a qualified engineer. The host society's president, Barata YB0AY, was the Honorary Conference President and was responsible for all protocol, formal and social duties.

Opening Ceremony

The conference was opened by His Excellency the Minister for Tourism, Post & Telecommunications, Mr Azwar Anas. The minister also signed an amateur radio first day cover and stamp featuring ORARI's logo.



At the IARU Region 3 Conference, Ron Henderson VK1RH was caught sharing a good joke with Larry Price W4RA, president of ARRL.

Societies Represented

Following the official opening and morning tea the conference got down to business. Fourteen of the 24 member societies were represented and four proxies were held. The Bangladesh Amateur Radio League, BARL, and the Radio Society of Sri Lanka, RSSL, were present at a Region III conference for the first time and the Philippines, PARA was back after a six-year break.

Conference Issues

The major issues of the conference, which had been advised through papers from member societies, were referred to working groups for detailed consideration. These included constitutional changes, finances, technical issues, promotion of amateur radio and amateur radio direction finding.

Constitutional Changes

The WIA proposed a number of constitutional changes aimed to improve the management and operations of the Region III Association. In the end our proposals (for limits to Directors' appointments of three tours each of three years or age 71, the renaming of the Chairman of Directors as Chairman and creation of a Treasurer) did not succeed. Nevertheless, the constitutional working party, on which Murray Kelly VK4AOK was our representative, carried out an exceedingly difficult task in the light of a "no change" stance from JARL and produced a consensus report with a number of recommendations. The least contentious of these were adopted, but some the WIA believed were key issues did not achieve the required 3/4 majority even with a secret ballot. This was not helped by one delegate taking the afternoon off for sightseeing, thereby abstaining from voting!

Progress was made on a number of procedural matters including renaming the association "International Amateur Radio Union Region III". Procedures were revised to formalise the conference eve delegates' meeting, for all agreed it was very effective in "breaking the ice".

The Chairman of Directors was af-

INTERNATIONAL AMATEUR RADIO UNION REGION III ASSOCIATION
The 8 Th Regional Conference.October 8–12 . 1991 .
Savoy Homann.Bandung.Indonesia.

firmed the principal officer of the Association, but (in the WIA's view) not accorded the wherewithal to carry out that role.

Regional Finances

Although IARU Region III is concerned with amateur radio policy and operating matters, the finances of the organisation always come in for considerable discussion. The triennium just past has been a difficult one financially, with additional travel for WARC preparation, both for IARU meetings and to promote amateur radio with national authorities throughout the region. The finance committee, on which Ron Henderson VK1RH was the WIA's representative, was faced with a paper from ORARI in which it sought some relief from subscription rate increases. The current subscription formula is based upon a sliding scale, with large societies paying considerably less for each additional member. ORARI and JARL are the largest two societies, yet they have very disparate national incomes. This becomes demanding on ORARI.

Another problem is the loss of a fair part of small societies' contributions in bank charges just to get the funds into the Region III accounts.

The committee considered a range of options and recommended that Directors examine several radical changes, such as a flat subscription rate per member, or even per licensed amateur, and report back to member societies.

In the end a three-year budget outlay program was agreed, priorities given to those outlays and a subscription rate calculated to raise the required income. For the next three years our contributions go up three US cents per member and this will be absorbed in tne 1992 fees. One key assumption is that membership numbers will hold steady at the present levels across the three years.

Technical Issues

This conference was somewhat different from previous ones in that there were no really contentious technical issues. The considerable effort put into band planning at past conferences has paid off and provided Region III with generally accepted and agreed plans. Topics discussed in working party, which was convened by Kevin Olds VK1OK, included packet radio operating guidelines, HF beacon proposals, potential uses for additional bands and contest band segments. A number of the member societies contributed their packet guidelines and a composite set was generated. It is included in WIA News on p6.

Beacons have reached the stage where the 14/21/28MHz time-switched HF beacon series is being extended to include the 18 and 24MHz bands. Over the next few years we will need to give thought to establishing more time and power switched HF beacons. At present the initiative is coming from IARU Region II which is designing beacon controllers to help the project.

Promotion of Amateur Radio in Developing Countries

The societies represented by IARU Region III range from the very large to the very small, from the quite affluent to those with limited resources to devote to amateur radio. Several papers were submitted which either described actions to assist other societies or identified means whereby societies believed they could be helped. The conference set up a working party, of which Roger Harrison VK2ZTB was an active member, to provide some recommendations. Their proposal categorised the situation into three classes and proposed means to assist in each case. One observation was the supply of electronic parts, including ICs, was not always a problem; however there was a great need to adapt existing proven circuits to accommodate the locally available components.

ARDF

Amateur Radio Direction Finding, or ARDF, is a growing sport not only in our region but world-wide. Two sets of provisional rules were examined and the preferred one from JARL adopted for the time being. A Region III committee, meeting by correspondence, was set up. The WIA has nominated Wally Watkins VK4DO, an active ARDFer, as our member.

The Next Triennium

The conference concluded with elections and selection of the next conference venue. One Director, DD Devan 9M2DD, stood down, having as he said "reached the biblical three score and ten". Six nominations were received for five positions and, after a secret ballot, the four retiring Directors, David Rankin 9V1RH (Chairman of Directors), Keigo Komuro

JA1KAB, David Wardlaw VK3ADW and Fred Johnson ZL2AMJ were re-elected, together with Sangat Singh 9M2SS the new director.

The Secretary Masayoshi Fujioka JM1UXU, was re-elected unopposed.

The WIA bid for the next conference but was not successful so it will be held in Singapore in the middle of September 1994.

Summary

In a report of this nature one can comment only briefly on the major points from the conference. In fact some 106 papers were submitted, copied to and digested by the delegates. Some, such as the beacon papers, will automatically go to the relevant areas in the WIA, in this example FTAC. A full list of all paper titles, or any particular paper, can be obtained through the Executive Office from the WIA's IARU liaison officer, Ron Henderson VK1RH.

As a final point, the WIA team, Ron, Kevin, Murray and Roger, wish to thank the Federal Council of several years past for their foresight in setting up the international representation fund which allowed this strong and effective WIA representation at Bandung.

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REPEATER LINKING STANDARDS — INTERIM GUIDELINES

At the 27 October 1991 meeting of the WIA Federal Council, a set of repeater linking standards was adopted as interim guidelines for Australian repeater linking. Based on a paper written by Bill Scott VK4XP, these interim guidelines are now published to invite comment before formal adoption as the repeater linking standards.

If you have any constructive comment to make about these guidelines, please write to:

WIA Repeater Linking Standards
PO Box 300
Caulfield South Vic 3162
Closing date for comment is 29 February 1992

Details of Proposed Australian Standards

Proposed is a simple method which may be used as a standard way in which radio amateurs could gain access to repeater links in Australia.

The paper does **not** intend to define standards or protocols of **how** repeaters themselves should be interlinked. This remains the prerogative of the individual repeater groups. However, it sets out the ways the average radio amateur, with the minimum of extra equipment, can successfully operate repeater links anywhere in the country.

Short Term and Long Term Plan

The standard is designed to address both the immediate and the long term. The methods of how an amateur would access the simplest repeater links or the most complex repeater links remain the same.

The standard also allows for growth. At first, repeater groups will probably build dedicated links between repeaters in a local area. Then, as this new facility develops and expands, more elaborate switching between repeaters widely separated geographically may also occur.

It is conceivable that, in the future, amateur satellites may even be used to provide links. And then the possibility exists for every repeater to be linked to any other repeater in the country, provided the necessary equipment is installed!

The standard proposed allows for this and, from the point of view of the amateur operator, the way in which the link is made does not matter. It could be by UHF radio, cabling or satellite. Accessing and operating the link equipment would be independent of the method of linking used.

Simply Dialling up a Number

The standard is based around simply dialling up the number of the other repeater, similar to using a telephone. Call the number of the repeater you want, using a keypad which can be connected on to any transceiver. Once "dialled", you will either have the link established to the repeater you wanted, or get a number-unobtainable tone if the connection cannot be made!

To clear-down all links, simply "hang up the phone" by pushing a button and sending the clear-down tones. It is that simple.

Once a link is in service there is a "musical" tone every one minute to tell you that you are linked up.

Wireless Institute of Australia Involvement

Every repeater that has link capabilities would need a number, not unlike a short phone number. It is proposed that the WIA co-ordinate this, and that repeater groups contact the WIA to get a number for their repeater. The WIA would also be in charge of maintaining the standard to make sure it is uniform throughout Australia.

It could regularly publish lists of repeater identification numbers in the Callbook and Amateur magazines.

As well, it could be asked to review the standard from time to time, as changes to equipment and regulations occur.

The standard proposed is designed for use today under the existing DoTC regulations. It is, however, flexible and can easily be updated to handle any changes in the regulations.

Easy to Buy Equipment

To access a repeater's linking equipment, an amateur would need a telephone-type keypad on the set. This is often called a Touchtone pad or DTMF (Dual Tone Multiple Frequency) pad. These are available on many sets as standard, or are easily fitted as a DTMF microphone.

If adopted, this standard allows for amateurs and groups to build up special tone-decoding equipment which can connect externally to the receiver, say through the extension speaker or auxiliary jack. With this equipment it would be possible to display the numbers dialled, showing which repeaters are currently linked. If a connection was also made to the microphone, abbreviated dialling facilities could also be possible.

One of the advantages of the proposed standard is that equipment manufacturers could mass produce equipment to meet the new standard, and so the prices and availability of this equipment should fall within the reach of every Australian amateur.

How it Works

A quick reference "How to set up and close down a link" is included below and should serve to illustrate the method proposed.

(i) To Clear Down any Link at any Time:

Command (from amateur) —

Send tone 00#. That is, press PTT button and hold down. Then press the 0 key, press it again, then press the # key, and finally let go the PTT Button.

Response (from local repeater) —

A short pip-pip when all links have cleared down.

(ii) To Link a Local Repeater to Another:

(eg, link local repeater 1234 to repeater 5678)

Command (from amateur) —

Send tones 5678#. That is, "dial" the other repeater's number.

Response (from local repeater) —

When the connection is made, a series of short music-like DTMF tones will be heard.

These tones will be repeated every one minute the link is made and the repeater is in use.

(If the amateur had tone-decoding equipment installed, it would be possible to read these DTMF tones. For the example above they would read 3-1234-5678. The 3 means currently connected, the 1234 is the local repeater number, the 5678 is the other repeater's number).

If the connection takes a long time, a short pip is heard every one second whilst the link equipment searches for a connect path.

However, if an amateur "dials" up a repeater which cannot be linked to the local repeater, or the other repeater is timed out, a long beep will be heard. This is similar to the number-unobtainable heard on the telephone.

(iii) Enquire is the Link Connected?

Command (from amateur) —

Send tones [11]#.

Response (from local repeater) —

Either a music-like DTMF tone sequence will be heard, or a short pip-pip. The musical tone indicates a link is already established, whilst the pip-pip means all links are closed down.

(iv) Response Summary:

Pip every one second — connection being made, other end "ringing"

Music-like tones — link in service

Peep — link unobtainable

Pip-Pip — all links cleared down

Summary

This brief outline covers basically how the average amateur would operate a link. It is written in simple, non-technical terms and shows how easy it would be to operate any link in Australia, regardless of the linking method or the distance or bands involved.

Next is the more detailed technical standard which may be used by the groups which actually set up a linked repeater system. It is based around the Australian Standards Association style for standard writing and, as such, is rather practical and direct.

It is believed to be the most suitable approach to writing a standard, as it is well proven and readily understood.

Australian Standard for Repeater Interlinking

Scope:

This standard sets out interface requirements (protocol) that shall be used by an amateur station wishing to establish, clear down and have indications provided as to the status of a link or links from a local voice repeater to another voice repeater.

It shall pertain to all voice repeaters operating in any of the following modes:

frequency modulation (FM)

amplitude modulation (AM)

single side band (SSB)

phase shift keying use (PSK) with pulse code modulation (PCM)

amateur television (ATV) sound only

linear translators

This standard does not attempt to regulate the methods, protocols or standards by which the links themselves are established in the switching process. Nor does it attempt to regulate the methods used by "control" amateur stations which may switch standby equipment, change over to alternative power supplies, read equipment voltages etc.

This standard refers only to the methods of access by the "user" amateur from anywhere in Australia who wishes to establish or close a repeater link or links. It is a user-to-local repeater protocol rather than a local repeater-to-remote repeater protocol.

Application:

This standard shall be applied to any single or multiple linked repeaters.

The standard shall be applied to any repeater, regardless of geographic location or method of linking or band of operation.

Mode examples include:

FM repeater to FM repeater (single link)

FM repeater to AM repeater (cross mode)

ATV voice to FM repeater (cross mode)

PSK/PCM repeater to SSB (cross mode)

Administration and Revision:

This standard shall be administered by the Federal Technical Advisory Committee (FTAC) which shall put into place processes to regulate the application of this standard.

The standards shall be freely available to all radio amateurs who may implement it using any suitable technology.

FTAC shall *not* stipulate the technology and method of application that may be used. However, it may advise on certain known methods that may be adopted by an Amateur organisation wishing to establish linked repeaters.

FTAC shall, from time to time, review this standard in a consultative process with the appropriate repeater groups. The standard shall be reviewed at no greater an interval than 10 years.

The review dates shall be in the years 2000, 2010, 2020 etc.

Each review shall receive a new review number and date.

Once reviewed, FTAC shall effectively publicise the fact and be prepared to implement any retrospective changes in a co-ordinated manner.

Publication:

All publications shall, at least, be in
Amateur Radio magazine
Australian Amateur Call Book

User Access:

All access from the user commanding the local repeater to establish or clear a link or links to other repeaters shall be by the use of Dual Tone Multiple Frequency (DTMF) tones, often called Touchtones.

All status replies from a repeater as to the progress of a link request shall be by DTMF tones.

Repeater Identification Number:

All repeaters which are capable of being linked to another repeater shall be identified by a four-digit unique number between 1000 and 9999.

This number shall be allocated by FTAC on a first-come, first-served basis. All numbers shall be sequentially allocated, commencing from 000 and prefixed by a number of the state. For example, in Melbourne 3002, in Brisbane 4082, in Kalgoorlie 6008 etc.

FTAC shall keep and regularly update a register of allocated repeater identification numbers. These numbers shall be regularly published at an interval of no greater than three months.

User Commands:

The following commands shall be used to control a local repeater for the purposes of establishing or clearing a link to a remote repeater:

1. **Link Req.** To request a link connection from local repeater to a remote repeater the user shall send the repeater identification number of the remote repeater, in DTMF tones, followed by a hash (#). For example 1234#.
2. **Link Clr.** To clear down *all* links to and from the local repeater the user shall send tones 00, followed by a hash (#). For example, 00#.
3. **Link Enq.** To enquiries on the current status of links the user sends tones 11, followed by a hash (#). For example, 11#.

Valid Commands

The command sequence shall be considered valid when it falls within the following limits:

a. Each DTMF tone must be longer than 50ms.
b. Each tone must be less than three seconds.
c. The total tone sequence must be of less than 10 seconds.

A **link req** sequence is not considered valid until a period totalling two seconds has elapsed since the last user input to the local repeater. Input to the local repeater is determined by loss of carrier and CTCSS tones, when used.

Status Responses:

All command tones shall be re-transmitted on the local repeater. When linked, these tones shall also be re-transmitted on the remote repeater.

The following status responses shall be sent by the local repeater to a user after a valid tone sequence has been received and after all user input to the local repeater has ceased.

All status response tones shall be sent prior to any CW or other repeater ident signal.

All status response tones shall not be responded to or acted upon whilst the local repeater is timed out (due to fault or excessive user access) except the **link clr** command.

If a status response has commenced, it shall be completed before the local repeater times out.

Only valid tone sequences shall be responded to:

(1)**Link Req.** Link request. Connections being established.
(2)**Link Unobt.** Link unobtainable. Link cannot be established.
(3)**Link Est.** Link established.
(4)**Link Dis.** All links disconnected and cleared down.

Link Req. Link request. Connection being established.

This sequence of tones shall be sent to the user on the local repeater after a valid (possible) link to another repeater may be established and the equipment is in the process of establishing the link.

It shall consist of a 200ms duration transmission of DTMF tone 1, repeated at one-second intervals, for a maximum period of 10 seconds.

It shall cease on:

(a)the link connection being established, or
(b)the link unable to be established, or
(c)another valid tone sequence being received.

Link Unobt. Link unobtainable. Link cannot be established.

This sequence of tones shall be sent to the user on the local repeater after a valid link to another repeater cannot be established, and the equipment has abandoned and closed down the linking process.

It shall consist of a 1000ms duration transmission of DTMF tone 2.

Link Est. Link established.

This sequence is sent to the user on the local repeater immediately the link to a remote repeater is established. **Link est** tones shall also be sent every one minute thereafter whilst the local repeater is transmitting and the link is in use.

All status response tones shall be sent prior to any CW or other repeater ident signal.

All status response tones shall not be responded to or acted upon whilst the local repeater is timed out (due to fault or excessive user access) except the **link clr** command.

If a status response has commenced, it shall be completed before the local repeater times out.

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Link Req. Link request. Connection being established.

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(b)the link unable to be established, or
(c)another valid tone sequence being received.

Link Unobt. Link unobtainable. Link cannot be established.

This sequence of tones shall be sent to the user on the local repeater after a valid link to another repeater cannot be established, and the equipment has abandoned and closed down the linking process.

It shall consist of a 1000ms duration transmission of DTMF tone 2.

Link Est. Link established.

This sequence is sent to the user on the local repeater immediately the link to a remote repeater is established. **Link est** tones shall also be sent every one minute thereafter whilst the local repeater is transmitting and the link is established.

The **link est** tone sequence shall also be sent in response to a **link enq** command sequence, and the one-minute interval shall be reset.

The link est tone sequence consists of
(a) tone 3
(b) the repeater identification number of the repeater through which the link req command was sent
(c) followed by the identification number of the repeater to which the link was requested
(d) 100ms pause (if necessary for multiple links)

For example, a link req was made through repeater 1234 to link to repeater 5678. The link est tone sequence would consist of the tone 3 12345678.

Each tone is to be of 50ms duration. The total would then be of 400ms.

Should more than two repeaters be linked, then the sequence would be extended with a 100ms pause between sequences. For example, a user at repeater 9012 successfully linked to repeater 1234, after a link had been previously established with 5678. Therefore the sequence would be, 3 12345678 <100ms pause> 90121234.

Link dis. All links disconnected and cleared down.

This sequence is sent to the user of a local repeater after all repeater links have been cleared down. This tone sequence shall also be sent in response to a link enq command sequence.

It shall consist of a transmission of tone 4 for a duration of 200ms, followed by a pause of 100ms, followed by a further transmission of tone 4 for a duration of 200ms.

Operations:

Whilst the repeater is establishing a link, normal repeater operations shall continue. If a local repeater times out, the link est tones shall not be sent, but the link shall remain established.

If a remote repeater is timed out when a link req is made, the link shall not be permitted to be established until the remote timeout has cleared.

Link est tone shall also be transmitted on the remote repeater or repeaters simultaneously with the local repeater. Other status tones shall not be transmitted on the remote repeater or repeaters.

Whilst a repeater is linked to another, it shall continue to operate as a repeater, with re-transmissions on its assigned output frequency for a correctly received input signal and with timeout functions enabled.

All local input to a repeater must override all linked input from a remote repeater or link equipment.

Where a change of link status has occurred whilst a repeater is in local use, the tones used to indicate the new status shall be stored and re-transmitted.

CTCSS Tones for Interference Suppression:

To reduce the interference caused by adjacent services, some repeaters may be fitted with CTCSS sub-audible tone decoder equipment. Each repeater fitted with CTCSS decoders for interference suppression shall have three decoders on the frequencies of 123Hz, 141.3Hz and 162.2Hz fitted.

When in use, the local repeater equipment shall consider that *both* the *COR* and *one* of the CTCSS sub-audible tones listed above are present before a correct access to the local repeater and subsequent link can be established.

CTCSS Tones for Link Permissions:

Some users are not permitted to have their transmissions re-transmitted via a link from another remote repeater, due to licensing limitations. Typical examples include novice licensees on 6m or 70cm and limited and novice licensees on HF repeaters.

Those who are permitted shall use CTCSS tone 141.3Hz to accompany all transmissions into a local 2m, where the user expects re-transmissions from a remote repeater on the 6m band and UHF and higher bands.

And where the user expects re-transmissions from a remote repeater on the HF band, use shall be made of CTCSS tone 162.2Hz to accompany all transmissions into a local repeater.

In all cases, the remote repeater shall consider that the appropriate CTCSS tone is present at its link input before the subsequent re-transmissions on that remote repeater can occur.

Where multiple repeaters are linked, the CTCSS tone requirement shall apply only at link input to those repeaters on which licence violations are to be restricted.

Tone Levels:

All transmissions and re-transmissions of DTMF tones shall be at 50 percent of the maximum voice level for that mode of transmission.

All CTCSS (sub-audible) tones shall be at 10 percent of the maximum voice level for that model of transmission.

Auto Clear Down:

Where a repeater licensee chooses, and in *all* cases where more than *three* repeaters are linked simultaneously, the repeater links shall have an auto clear-down circuit in operation.

The auto clear-down shall occur if no input is received within 20 seconds on any of the repeaters linked at that time. This process shall cause the most recently established links to be cleared successively in the opposite order from which they were established until a maximum of three repeaters remain linked.

A link enq response shall occur on all repeaters that were linked, prior to the auto clear-down operation occurring, to indicate to users the new link status.

Auto Link Requesting:

Where a repeater licensee chooses, auto link requesting circuits may be in operation. This circuit shall re-establish links to a maximum of three repeaters, if no input is received on a nominated repeater within 20 seconds.

If an auto link request was not successful, due to operations of other repeaters or link equipment, it shall not be repeated within one hour.

A link enq response shall occur on all repeaters that were not linked, prior to the auto link requesting operation successfully re-linking them, to indicate to users the new link status.

Typical Questions and Answers about Australian Repeater Linking Guidelines

Will Scott VK4XP

Question 1: How can I use the standard linking commands to set up links with three repeaters simultaneously?

Linking to many repeaters is as simple as linking to only one repeater. Imagine your local repeater is 2233 and you wish to link to 1234 and also 5678.

First establish the link with one of the other repeaters, say 1234, by sending 1234#. The repeater will respond with a music-like tone sequence 3-2233-1234.

Next make the link with the second repeater by sending 5678#. The local repeater will again respond with a music-like tone sequence of 3-2233-1234-5678.

You are now linked to three repeaters simultaneously.

Every one minute you will hear the same music-like tone sequence, so you and amateurs on other repeaters can tell the link is set up. To clear all links down, send 00# and the repeater will respond with a short pip-pip to indicate all is clear.

Question 2: How did the repeater numbers come about?

To identify each repeater's "phone number" numbers had to be found that

would make it easy to use, and that no two numbers were the same. The repeater numbers are arranged so the state is the first part, and a simple serial number is the second part.

An example is the first repeater registered in Victoria would be 3001, next would be 3002. The standard calls for the WIA to circulate lists regularly. (Alternative — nearest postcode).

Question 3: Why are three sub-audible (CTCSS) tones used?

These tones have two purposes and are used *only when necessary*. Repeaters which do not need them are not fitted with them.

The first purpose is to reduce interference from other services on radio sites with lots of radio equipment in the close vicinity.

The second is to exclude certain holders of amateur licences from being accidentally re-transmitted on a linked repeater they are not permitted to use.

The tones set out in the standard effectively say that:

Novices use tone 123Hz only when repeaters are wired for interference suppression.

Limited calls use tone 141.3Hz both for access to 70cm and other repeaters from 2m, and for interference suppression.

Full calls use tone 162.2H both for access to 10m repeaters from VHF or UHF repeaters, and for interference suppression.

This way a radio amateur has to install only a single tone CTCSS card for access to all repeaters, in any band, in Australia.

Question 4: How much does it cost?

Generally the cost is very low. The basic intention is to make sure a suitable Australian standard can be established at minimum cost to the amateur, but be easy to use with readily available equipment. Because of this, some repeaters may be a little more complex, but they make it easier and cheaper for you to use.

The first thing you will need is a DTMF microphone, which is used to turn links on and off. It runs out between $30 and $60 for a new microphone or a keypad.

In a limited number of cases, where repeaters on other than the 2m band are involved, you will also need a CTCSS board. This small board is installed in your radio and is about the size of a postage stamp. This board will need to be set up on one of the three standard CTCSS tones, depending on your licence. Cost runs out at about $40, with installation costs extra.

Question 5: As a club, which CTCSS tone decoders should we install in our repeater for interference suppression?

You should install all three Australian standard decoder cards and wire them all in parallel. This would mean that any one tone would access the repeater.

The cost to you as a club is a little higher than for the individual. But for the amateur community as a whole, it is cheaper to install three decoders in each repeater with interference problems, than to have two or more encoders in each amateur transceiver.

Question 6: What about my rights to determine if and when I wish to have my transmissions links to another repeater?

This is catered to by the standard. Firstly, if you wish to know whether a repeater is linked to another repeater, simply send the **link req** tone sequence of 11#. The reply will be either a pip-pip which means there are no links in service, or a musical tone sequence, indicating a link is established.

Next you may at any time clear *all* links by sending 00#, and a pip-pip will be heard indicating all clear.

Finally, if you are in the middle of a contact and another station using a remote repeater links into your local repeater, you will hear the **link req** tone sequence as the link is established, and then every one minute you will hear the musical tone sequence to indicate a link is up.

At no time, therefore, will you be "in the dark" as to what the status of the linking is, and always you will have the opportunity to clear down all links by sending the 00# tones.

Question 7: The DTMF tones will be easily heard and encourage "phantom button pushing".

Unfortunately, any repeater is open to abuse, and most people agree that, if methods can be adopted which reduce this abuse at a reasonable cost, they should be employed.

For linking purposes, the CTCSS tones are sub-audible and normally should not be heard. The DTMF tones, however, are required to be heard so you can work out what is happening with the linking equipment.

Not every station will be in a position to have tone decoding or similar equipment, to read high-speed signals coming from the repeaters, telling you what linking is taking place. So the simple solution is that stations must simply listen to the tones and read them by ear.

The tones you are required to recognise, like the telephone, are if a link is established (music link tone sequence), if a link is trying to be established (pip every one second), if a link cannot be established (long peep), or if the link is clear (pip-pip).

Future revisions of the standard, as the technology becomes economically available, may make use of high-speed ASCII burst type of tones, which are less attractive to button pushers and less annoying to the general user.

Question 8: What is auto clear-down and why is it required?

Auto clear-down is an automatic process that a club may place on its repeater linking system. It will disconnect a link if no-one uses it and leaves it idle for a while. The standard recommends if this is employed auto clear-down should occur after a period of 20 seconds of no use.

The DoTC requires that, for permanent linking, a maximum of three repeaters may be employed, and that to link more than three repeaters, temporary links must be used. That is, it is permitted to selectively link more than three repeaters together for a limited period of time.

To satisfy this requirement, the linking standard calls for auto clear-down of one or more repeater links when more than three repeaters are linked together. The clear-down would bring the links back to three repeaters or less, but only on completion of a contact.

This should occur if there is a period of no use for a maximum of 20 seconds. The links should clear down in the reverse order of being established.

As well as this, the standard calls for a link status to be broadcast over each repeater when a change occurs.

Question 9: How will changes to the regulations and improvements in technology affect the standard?

Naturally it will depend on the particular change in question. Generally speaking, any standard should be flexible enough to withstand the tests of time, and should not get you into a corner you cannot escape from in the future.

The Australian Linking Standard proposed is firm enough to give long-term guidance, whilst being flexible and able to adopt new technology an methods as they become available. If a review has not occurred within a certain time period (10 years), the standard calls for an automatic update.

Question 10: As a club, we should always retain the right to switch the repeater linking on and off. How does the standard cater to this?

The standard is designed to cover access by an amateur station to the local repeater only. That is, only the tones that would be sent and received by the user amateur are regulated in the standard.

As a licensee of a repeater you do, indeed, have the right of control to switch a repeater and links on and off when desired. What tones or methods you employ to do this are *not* covered by the linking standard. You may use any appropriate method you wish.

Similarly, the standard does *not* cover how your repeater establishes its link with another repeater. This again is your prerogative. The standard simply says that if a user requests a link, and linking is possible, that your repeater provides it using the method most suited to your needs.

However, it is important to recognise that, in all cases, the users too have the right to close down a link if they do not want their transmissions to appear on another repeater. All "permanently" linked repeaters must be able to have the links cleared by a user amateur. (See also question 11 below).

Question 11: How and where is auto re-linking used?

Where repeater licensee/s require that a chain of repeaters normally remain in a linked state, the establishment of those links is by the same method described in question 1.

Similarly, the links must be able to be disabled using the 00#, the link clear-down tones.

But, if the licensee/s want to have the repeaters normally linked, the repeater system may automatically re-establish the link using an auto **link req**, once a user has completed the contact. This is usually after 20 seconds of no further input.

If the auto re-linking fails on its second attempt, auto re-linking must not attempt another **link req** for one hour.

Question 12: How long will it take to implement this proposed standard?

It is suggested that a five-year period be used to change over any existing repeaters and links not complying with the standard.

This will allow an adequate time period to replace existing equipment as it simply "wears out" or requires routine maintenance.

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Help stamp out stolen equipment – keep a record of all your equipment serial numbers in a safe place

A CENTURION AMONG US

A PROFILE OF HARRY ANGEL, VK4HA
DAVID JONES VK4KLV

JUST ON 100 YEARS AGO, there came into the world one Harry Angel, the first of a family of seven children. Born in Essex, UK, Harry's early interests were as a mariner. With a bit of larrikin in him, a strength which he still displays today, Harry challenged the worst that old Mother Nature could do. He crewed on an oil tanker to Philadelphia, then took a four-masted barque, the *"William P Fry"*, around Cape Horn to San Francisco. So rough was it in rounding the Cape that Harry was washed overboard, only to be washed back on a few minutes later! Then he crewed a windjammer to Sydney, a voyage which took some three months. Some time later, he returned to the sea as an Able-Bodied Seaman, crewing on many an ocean-going cargo ship. During his service in the Merchant Marine, Harry travelled all over the world, twice visiting the U.K.

When war was declared, Harry joined the AIF, enlisting with the First Division. He was among those who landed at Gallipoli. After service, he returned as a Recruiting Sergeant, finally settling in Queensland as a transporter/carrier/driver after the war.

With exposure to mechanical and electrical devices, Harry rapidly rekindled his interests in the developing medium called radio, something he was first exposed to in the Merchant Marine. He established Angel's Radio Service, based at St Lucia in Brisbane. This commenced in the early 1930s, and continued with his XYL Rebecca until she passed away in 1973. But the radio bug had bitten! It wasn't long before Harry decided that receiving was too small a part of the whole picture — how about experimenting with transmitters and antennas? So, in 1935, Harry sat for his AOCP, and subsequently devoted the rest of his life to pursuits in radio and electronics. His list of achievements reads like a glossary of terms, with numerous awards and certificates, including DXCC, all using home-brew equipment.

Harry's family life has been shared with his children, their children, and their children's children. He and Rebecca had two sons, Ron and Harrold, and a daughter Lillian, with whom Harry now lives. Ron gave Harry two granddaughters, Robyn and Delma, who between them gave him five great-grandchildren.

Harrold gave him two grandchildren, Brian and Henry, who also gave him great-grandchildren. Lillian gave him two grandchildren, Fay and Robert, and between them, they've given Harry six great-grandchildren, twins Rechelle and Tamara, Tegan, Matthew, John and Tanya.

So now you know a little about the man behind the smile, Harry Angel VK4HA. On 14 December, Harry will celebrate his 100th birthday. He's planning to be active on 40m, and the Queensland Division would like to encourage all Harry's friends to give him a call on the Coral Coast Group Net, at 8am EAST, on 7060kHz. If you can, send him a birthday card, just so you can wish him happy birthday yourself. Please send it to Harry's Birthday, c/- GPO Box 638, Brisbane, 4001, so that it's received by the 12 December. You know Harry just could be the oldest living amateur, full stop!

So Happy 100th Birthday, Harry Angel VK4HA.

DAVID VK4KLV
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FROM RUSSIA WITH LOVE

JOHN MAHONEY VK4JON
PO Box 194, INNISFAIL 4860

WELL, THAT'S HOW THE local newspaper headlined the article when it published Musa's photos, but there's more to it than the title of a novel.

It started out as a simple computer problem. How do I access the escape codes on my printer? My XYL introduced me to a teacher at the Innisfail High School who taught maths and something called "Information Processing and Technology", Stan Robertson. When Stan found out I was a radio amateur, all thoughts about printer codes went out the window. He enlisted my help in his course. "Er, John," he said, "amateur radio would be a good way of teaching my year 11 class about IPT." (No prizes for guessing which high school now has the callsign of VK4IHS).

At first I made an attempt to organise a contact with a secondary school in Japan. A letter was drafted, then sent to an interpreter to be copied into Japanese characters so that both English and Japanese versions could be sent to the JARL. To date no reply has been received, but I did ask for a school that could speak English.

When I saw in the Amsat newsletter an offer to schools in Australia to have the opportunity to contact the American astronauts on board STS-39, I jumped at it. We all know the results of that, but we had a go. A phone call to Maggie VK3CFI to find out if we were the mugs led to an attempt to contact U2MIR on packet. It took a few orbits to organise, but finally the big day arrived when the students from Innisfail High were to have a QSO on packet radio with a Russian spacecraft. You wouldn't want to know about it! Murphy was around, so no QSO. Still, not every experiment works. I was able to contact U2MIR when no-one else was here, so I uploaded some questions the students gave me, and next day had the reply. By now, Musa and I had almost a regular sked going. I gave him some dates from which to choose one suitable for him and, on 1 May, had a shack full of teachers, parents, students and a neighbour with a video camera. Results? Murphy still lives.

Two days later we had another go, and this time contacted Musa by packet and voice. We were the third school in the world to do this. The first was Maggie VK3CFI, with students from the school at which she teaches in Colac, and the second, I understand, was in France.

Participants at Innisfail High School (from left) John Mahoney VK4JON, Stan Robertson (science teacher), Glen Jacobson, Jodie-Lynn Bryce, David Plath, Rickie Philp and Paula Robinson. (Courtesy Innisfail Advocate*)*

The gear was nothing fancy. Just a Kenwood TM221A with a half-wave vertical antenna at about 30ft.

Everyone who wanted one, got a copy of the video. The Innisfail newspaper gave us excellent support, as did 4KZ radio. The Queensland Education Department helped us with a news release, so for a while we had more phone calls than we could cope with.

Just a few days ago interest was rekindled by the arrival of a short letter, a QSL card and three photos from Musa. We had sent him a copy of the video, a QSL card signed by the students and teachers, and all the newspaper cuttings I could lay my hands on. His reply is dated 24.8.91. The card etc was placed in a Russian envelope and then put into another envelope which was stamped and postmarked in Japan. It arrived sometime while I was on holidays at the end of September. (Musa's home call is now UV3AM — Ed).

As a result of these endeavours, Innisfail High School now has an amateur radio club with its own call. Stan is studying for his limited licence so the school club can operate without external assistance. They will have to put up with me for the moment, but that won't be a problem until they can get some equipment. By then, he'll be qualified. In the meantime, how does this printer work, and where are these other satellites ....? ar

Autographed photo of Musa Manarov. The Russian handwriting translates as "(To) John VK4JON OM, (from) Musa Manarov U2MIR. (In) good teaching. (signature) 24.08.91." (Courtesy Musa Manarov)

SURPRISE PARTY FOR PIERCE HEALY VK2APQ

TO CELEBRATE THE 80TH birthday of that well-known amateur, Pierce VK2APQ, a host of long-time amateur friends, plus relatives and neighbours, gathered at the Cataract Park Scout Camp on Sunday 18 August. It was a great day, and one that obviously came as a very genuine surprise to the guest of honour. For once Pierce was stuck for words. He was with people he had not seen for goodness knows how many years. Many had travelled for hundreds of kilometres to join with Pierce on this special event. There were also scores of apologies from people who could not be there for many reasons, the main one, of course, being travelling distance. Many of these were interstate friends.

Among those present were George Pile VK2GP, Phil Watson VK2ZPW, Syd Molen VK2SG, Bill Hall VK2XT, Alan McLeay VK2PII, Bill Storer VK2EG, John Cannon VK2NJC, Roy Parton VK2KO, Sid Ward VK2SW, Chris Cowan VK2PZ, Norma Stanley VK2BNS, Tony Mulcahy VK2ACV. Many of the above amateurs had their wives with them. On a quick count-round among the amateurs present, it was found there was a total of more than 500 years of active amateur radio involved.

Left to right: Sid VK2SW, Pierce VK2APQ, Roy VK2KO, Bill VK2EG

Bill Hall and Chris Cowan took out the honour of being the "longest on the air", with each boasting 61 years licensed AR to his credit. Hot on their heels was the guest of honour with 52 years, and Syd Molen with 47 years.

It was a great day and one for which Pierce's daughter Pat and family, who organised things, can be justly proud. See you on your 90th, Pierce. Congratulations on the 80th.

SID WARD VK2SW ar

BOOK REVIEW

On Ultra Active Service

by Geoffrey St Vincent Ballard

REVIEWED BY JIM PAYNE VK3AZT

This book tells the gripping and hitherto top secret story of the Australian Signals Intelligence effort during WWII. Ballard was one of the elite few who had access to the material produced.

The story travels with Special Wireless sections through Greece, Crete and Syria where Axis communications were intercepted. The story then shifts back to Australia, and covers training in Kana (Japanese Morse). Interception and code-breaking methods are detailed and interspersed with brief unit histories, poems, photographs, personal anecdotes and references to the important roles played by the women's services. Sigint required close co-operation with other British and US forces in the SWPA and SE-Asian theatres, and some of the narrative makes fascinating reading. Ultra was the top secret codeword for intelligence derived from enemy high grade cyphers.

This large book, with colour illustrations, is available from Mr Steve Mason, 2/18 Kasouka Rd, Camberwell Vic 3124, phone (03) 882 6735, price $50. ar

BOOK REVIEW

The Magic Spark

50 Years of Radio in Australia,

R R Walker

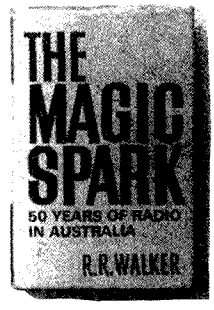
ISBN 7256 0116 7

THE HAWTHORN PRESS, MELBOURNE, 1973

Subject: History of Commercial Radio in Australia, 1923-1973

This book of 192 pages and A5 size chronicles the development of commercial broadcasting in Australia from its beginnings in 1923, largely initiated by amateurs and budding entrepreneurs, through to the 1970s domination by large corporations and, of course, the ABC network. The book has limited technical information and concentrates on the personalities who developed commercial radio stations as well as details of the careers of well known presenters, but it does have some interesting historical snippets concerning the extensive amateur involvement in early wireless broadcasting.

Although amateurs "broadcast" musical and classical items and AWA sent out "wireless concerts" in the early '20s, the first official broadcast was from station 2SB in November 1923. 2SB (which was later changed to 2BL because the original call sounded like its rival 2FC) was operated by Broadcasters (Sydney) Ltd with an amateur licensee, W J Maclardy 2HP, as a major shareholder and operator. He was also the publisher of *Wireless Weekly*. Other amateurs mentioned in the book include C V (Pa) Stephenson 2IY, who started 2UE (originally 2EU after his business Electrical Utilities), Harry Douglas 2HD (Newcastle) and Edward Gold 4GR (Gold Radio, Toowoomba).



The book has a number of black and white photos and an appendix which lists all commercial licensees since the inception of broadcasting up to 1973. The book was released in 1973 to coincide with the celebration of 50 years of commercial radio.

Original price of the book was $5.95, and it currently sells for $5 to $10 on the secondhand market. **VK2DYM**

ar

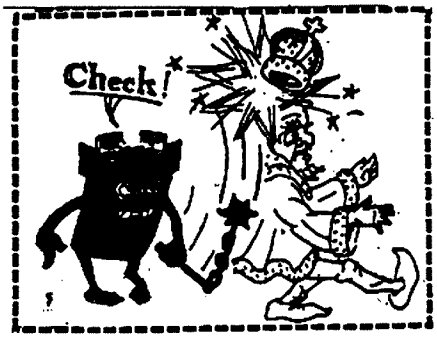
Radiochess

BY VINCENT LUCIANI K2VJ
218 W REVERE AVE
NORTHFIELD NJ 08225 USA

IF YOU WERE TO DISCUSS THE America's Cup with other than ham radio operators, you would surely be discussing sailing ships.

But if you were to read "America's Cup" within these pages, you would do well to suspect amateur radio, because what we are really talking about is the America's Cup for Radiochess, an international sport twice conducted on the ham radio bands.

Radiochess, you see, is a thriving spinoff from our amateur hobby, one you might like to know about if you enjoy chess, no matter your skills. After all, most of us have a less than keen awareness of the game's sometimes astounding collection of titled niceties. But, not to worry - there is always someone to cheerfully assist learners while beating them at a match.



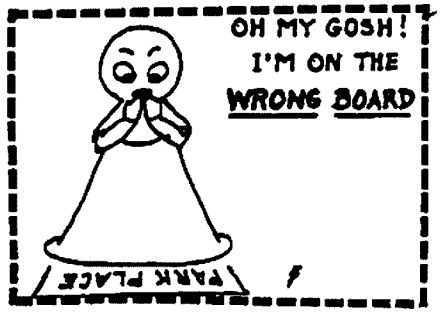
CARI- Chess & Amateur Radio International- was formed in 1981 as the vehicle by which to enable chess-playing hams to find a companion on the bands. Over the years, CARI - the longest-running radiochess organization in the world - has sponsored nets, matches between schoolkids across the US, and even between chess clubs in different countries.

Peaking earlier at approximately 350 members from 15 countries, members stay in touch via its official publication, *CARI News,* which lists chess nets and also correspondence from members including descriptions of their over-the-air games, invariably those they've won.

Non-hams have also joined CARI. With the advent of novice SSB on the 10m DX band in the US, the enticement has been great and many have since become licensed.

The new US no-code licence may also help because there are several who enjoy their radiochess on 2m repeaters. It is all a matter of finding someone for a game - which is, and was, the original CARI motivation.

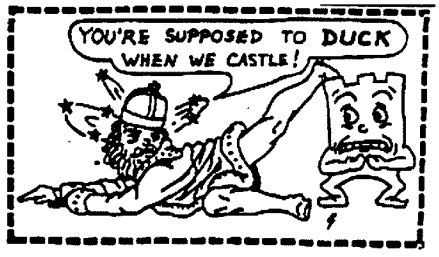
On the "America's Cup for Radiochess" thing, the Aussie-New Zealand team won the first meet, US the second, in a tie-breaking game that began on 20 metres, went on for eight hours, ending up on



40m. They still talk about it as a pacesetter for ultra-conservativism in chess.

CARI President and newsletter editor/publisher John Dould, WF1L, himself a master chess player and noted CW op, (he handles 40wpm manually in QSO) provides newcomers with a sheet that explains how to send moves over the air either by voice or CW. One game makes you an expert in its application.

If you like chess, and if you like ham radio, the melding of these two fine hobbies invariably sets up a chemical reac-

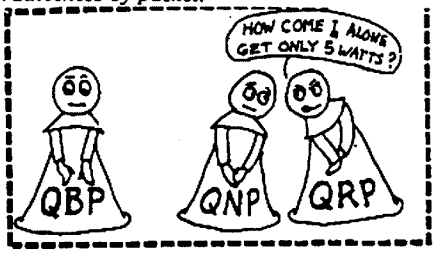


tion to participants that is highly pleasing and rewarding.

Good luck. Watch out for the deadly, heart-stopping, "queen on delta seven takes knight on delta four. Check mate!"

ar

CARI membership is a mere $US10 per year. Simply send cheque made payable to: John Dould WF1L, 22 S Athol Rd, Athol, MA 01331, USA. Send SAE & IRC to obtain information on sending moves, etc. Also, be sure to give name, QTH, licence class, bands and modes, for many are now enjoying radiochess by packet.



FT-767GX BASE-STATION MULTIBAND TRANSCEIVER

2 YEAR WARRANTY

The FT767GX is the *ONLY* transceiver that offers such a high level of performance on all HF amateur bands, as well as on the 6m, 2m and 70cm bands. Features include all amateur band coverage from 1.8 to 440MHz (100W max HF, 10W max VHF/UHF), all mode operation on all bands (SSB, CW AM, FM, FSK), HF receiver covering 100kHz to 30MHz with up to 104dB dynamic range, inbuilt automatic HF antenna tuner, digital wattmeter and auto-calculating SWR meter. Also includes handheld MH-1 microphone.

Cat D-2935

HF, 6m, 2m, 70cm

SAVE $200 **$3295**

LIMITED STOCKS

FC-757AT AUTO ANTENNA TUNER

A quality HF auto antenna tuner designed to provide all the antenna switching, matching and metering requirements of the modern amateur station. Designed for the FT-757GX series which provide automatic band switching, it can also be powered by an independent DC source and used with any other 100W HF transceiver.

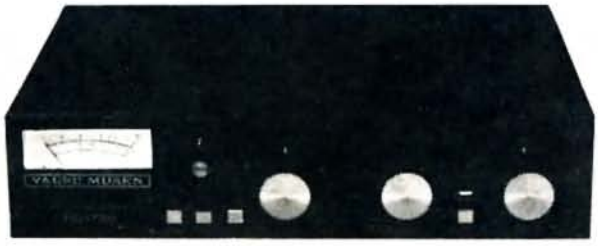
The microprocessor allows fast, impedance matching using a modified pi-L network with a power handling of up to 150watts. An inbuilt 100 watt dummy load is provided along with an in-line RF Wattmeter and auto calculating SWR meter.

Specifications

Freq. Coverage:	All HF amateur bands (1.8 - 30MHz)
Matching Range:	25 to 100 ohms (1.8 - 2.0MHz)
	10 to 250 ohms (other amateur bands)

Cat D-2942

$699



FC -700 ANTENNA TUNER

An ultra compact antenna tuner designed for operation on the 80-10 metre amateur bands (including WARC). The Yaesu FC-700 offers outstanding performance and unbeatable reliability. It includes a built-in SWR and power meter (15 and 150 watt scales) and internal, selectable 50 ohm 100W dummy load. Provides a 50 ohm load to the transceiver when the antenna impedance is within the 10-250 ohm range.

Cat D-2917

SAVE $30 **$299**

FT-290RII 2M MULTI-MODE TRANSCEIVER

The all-mode, transportable transceiver for serious field or mobile operations! The FT-290RII features FM, SSB (USB/LSB), and CW operation with 2.5W or 250mW switchable output power, twin VFOs and 10 memories that store mode and simplex or repeater frequencies. Selectable tuning rates are provided for SSB/CW and FM, while mode specific features such as a noise blanker and clarifier control for SSB/CW, plus a full set of functions for FM repeater operation make these units very simple to operate. Each unit comes with a FBA-8 battery holder for nine C size standard or NiCad batteries (not supplied), antenna, and handheld microphone. The FT-290RII with flexible rubber antenna covers 144-148MHz.

Cat D-2875

2 YEAR WARRANTY

$699

DICK SMITH ELECTRONICS

MAJOR DICK SMITH ELECTRONICS AUTHORISED STOCKISTS:

NSW: ARMIDALE New England Electronics 711655 BALLINA Ballina Electronics 867022 BATEMAN'S BAY Baycity Sight & Sound 725030 BERMAGUI OZTECH Electronics 934242 BOWRAL Bowral Electrical Supplies 611000 BROKEN HILL Hobbies & Electronics 884098 COOTAMUNDRA Cootamundra Music & Lite 422561 COFFS HARBOUR Coffs Harbour Electronics 525684 DENILIQUIN Denl Electronics 813672 DUBBO Chris s Hi Fi 828711 FORSTER Forster Village Electronics GOULBOURN Tunlive 22 1288 545006 GRAFTON Repairs & Spares 421911 GRIFFITH Miatronics 624534 INVERELL Inverell Electronics 221821 KEMPSEY P&L Leonard 631134 LEETON Leeton Audiotronic 532800 LIGHTNING RIDGE Lightning Ridge Newsagency 290579 LITHGOW Douroy Photographics 513173 LISMORE Decro Electronic Services 214137 MOREE Moree Electronics 522091 MUDGEE Headware 723895 MURWILLUMBAH Strings & Things 723684 NARRABRI Namoi Computer Service 923274 NELSON BAY Nelson Bay Elect & Hobbies 813685 NOWRA Nowra Electronics 210722 PARKES Strad Music Ctr 623366 PORT MACQUARIE Hastings Computer Service 834574 RICHMOND Silicon Crafts 784101 ULLADULLA Coastal Electronics 553989 WAGGA WAGGA Phillips Electronics 216558 WELLINGTON Wellington Service 452325 WINDOR Silicon Crafts 776722 YASS Warmington Electrical 261116 YOUNG Keith Donges Electronics 821279 **VIC:** ARARAT Jerram Electronics 522345 BAIRNSDALE LH & LM Crawford 525677 BENALLA North East Electronics 622710 COLAC Colac Electronics 312847 MILDURA Pullman Auto Pro 232882 SHEPPARTON Andrew Guyatt Electronics 219497 SWAN HILL Nyah Distnct TV Service 329303 TRARALGON Traralgon Electronics 741699 WARRAGUL Roylaine 234255 WARRNAMBOOL Korott St Elec Services 627417 **QLD:** AYR Delta Electrix 831566 BOWEN Delpro Agencies 863477 BUNDABERG Bob Elkin Electronics 521785 CALOUNDRA Electro-mart 918533 DYSART Dysart Videotronics 582107 GLADSTONE Electronic Enterprises 726660 INGHAM Masons Electronics 763188 INNISFAIL Innisfail Hi-Fi 612014 KINGAROY MD & MM Siegle 624535 MACKAY Stevens Electronics 511723 MARYBOROUGH Keller Electronics 214559 MOOLOOLABA Dalma Services 448666 NAMBOUR Nambour Electronics Shop 411604 PIALBA Keller Electronics 283749 STANTHORPE Granite Belt Communications 813333 **TAS:** BURNIE Electronic City 314760 DEVONPORT Al Electronics 248322 LAUNCESTON Kitronics 344555 **SA:** MT GAMBIER Hutchesson s Communication Ctr 250400 PORT LINCOLN Basshams TV & Comp World 822788 WHYALLA Eyre Electronics 454764 **WA:** ALBANY Micro Electronics 412077 BUNBURY Micro Electronics 216222 GERALDTON Batavia Lighting & Electrical 211278 KALGOORLIE Today s Electronics 215212 KARRATHA Pilbara Office Supplies 854836 MANDRAH Micro Electronics 5812206 PORT HEDLAND Ivan Tomek the Elect 732531

BATTERY BONUS OFFER!

FT-411E ENHANCED 2m HANDHELD

Our best 2m handheld! The enhanced FT-411E now provides both improved receiver sensitivity and better rejection of out-of-band signals, whilst retaining its compact size (55 x 155 x 32mm) and ease of use. The multi-function back-lit keypad allows fast frequency entry, plus programming of the 49 tuneable memories, setting of the programmable 'power saver' system and a host of other convenient functions. The microprocessor control system also features 2 VFOs, rotary dial tuning in 5 selectable tuning steps, a back-lit 6 digit LCD screen with bar-graph PO/S-meter, and a range of scanning features including busy channel, band, selective memory scanning and priority monitoring. VOX (Voice Operated Tx) circuitry allows hands free operation with the optional YH-2 headset. The FT-411E is supplied with an ultra long-life 7.2V 1000mAh Nicad battery pack, carry case, belt clip, 'rubber duckie' antenna and approved AC charger.
Cat D-3350

2 YEAR WARRANTY

* SPARE BATTERY OFFER

Specifications:

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10, 12.5, 20 & 25kHz
Supply Voltage:	5.5-15V DC
Output Power:	2.5W @ 7.2V
Current Consumption-	
Stand-by (with 1 sec. save):	7mA
Receive:	150mA
IF Frequencies:	21.4MHz, 455kHz
Sensitivity (12dB SINAD):	Better than 0.158uV

*BONUS CA-2 DESK CHANGING STAND
SAVE $39.95

$449

Ultra Compact

FT-23R 2m HANDHELD

2 YEAR WARRANTY

The FT-23R is an ultra-compact (just 55 x 139 x 32mm) microprocessor controlled handheld transceiver that offers extremely rugged construction and exceptional ease of use. It covers 144-148MHz and features 10 memories, 6 digit LCD with PO/S-meter, band/memory/priority scanning, 1MHz up/down stepping, repeater reverse operation, selectable tuning/scanning steps, diecast transceiver casing, FNB-10 600mAh **NiCad Battery** pack giving 2.5 watts output and rubber gasket seals around all external controls and connectors. It comes with a mini 'rubber duckie' antenna, carry case, belt clip, and approved AC charger.
Cat D-3490

* BONUS FBA-17 DRY CELL CASE,
SAVE $19.95

$369

* SPARE BATTERY OFFER

Specifications:

Frequency Coverage:	144-148MHz
Channel Steps:	5, 10kHz, 1MHz
Supply Voltage:	6-15V DC
Current Consumption-	
Stand-by:	19mA
Receive:	150mA
Sensitivity (12dB SINAD):	Better than 0.25uV

2m & 70cm In One!

FT-470 DUAL-BAND HANDHELD

Dual-band performance at its best! The FT-470 is a very easy to use handheld transceiver that offers a high degree of flexibility through the use of a sensible microprocessor control system to provide both 2m and 70cm operation in one compact unit. Dual independent IF circuits allow several functions to be performed simultaneously, including dual-band reception, and full cross-band operation. The FT-470 also has 21 tuneable memories and 2 VFOs per band, plus inbuilt C.T.C.S.S. (tone squelch) with a paging facility and a wide variety of scanning functions. A back-lit LCD screen shows a 5.5 digit frequency display on both bands simultaneously and bargraph PO/S-meter lets you know exactly what you're doing. A programmable 'power-saver' system helps maximise battery life, allowing squelched receive current of as low as 7mA. The FT-470 comes with an ultra-high capacity 7.2V 1000mAh NiCad battery pack, carry case, belt-clip, dual band antenna and approved AC charger.
Cat D-3360

Specifications:

Freqency Coverage:	144-148MHz, 430-450MHz
Output Power:	2.3W (both bands, 7.2V)
Supply Voltage:	5.5 to 15V DC
Current Consumption	
Stand-by (with 1 sec. save):	8mA (each band)
Receive:	150mA (each band)
Sensitivity (12dB SINAD):	Better than 0.158uV (both bands)
Size:	55 x 180 x 32mm

*** BONUS BATTERY OFFER**

Purchase any of these Yaesu handhelds before Christmas, and you can purchase a spare FNB-14 1000mAh NiCad battery pack (D-3351) for just $69. Save $30!
This offer supercedes all previous offers.

2 YEAR WARRANTY **$699***

DICK SMITH ELECTRONICS

DS XPRESS PHONE & MAILORDER SERVICE
Outside Sydney (FREE Call) 008 22 6610 Sydney And Enquiries - 888 2105
FAX: (02) 805 1986 or write to DS XPRESS, PO BOX 321 N/RYDE NSW 2113
All Major Credit Cards Accepted. O/Nite Courier Available.

YAESU STOCKS NOT HELD AT ALL STORES. PLEASE CONTACT YOUR LOCAL STORE FOR STOCK AVAILABLITY, OR ORDER BY PHONE 008 22 6610

B1261/M2

VHF SAVINGS

2 YEAR WARRANTY!

FT-212RH MOBILE 2M FM TRANSCEIVER

SUPER VALUE

With 45 watts output over the 144-148MHz range, a rugged diecast chassis for superb RF isolation, extensive use of surface mount components, and a large back-lit LCD with bargraph PO/S-meter, the FT-212RH is an ideal mobile FM transceiver that also doubles as an easy to use base station. Features include 5 selectable tuning steps, a total of 21 memories (18 general purpose, one CALL-channel, and 2 sub-band limit memories for band scanning), in-built C.T.C.S.S. encode, as well as a variety of scanning functions. The FT-212RH comes with a mobile mounting bracket, convenient MH-14A8 hand microphone, and DC power lead.

Cat D-3494

SAVE $70 **$499**

YAESU

FT-4700RH DUALBAND MOBILE FM TRANSCEIVER

Features 50 watts output on 2 metres, and 40 watts output on 70cm (430-450MHz), with Full-duplex crossband operation or dual-band reception modes provided, so you can listen for calls on both bands simultaneously, or work someone on one band while also listening on the other band. The optional YSK-4700 extension cable allows the main body of the transceiver to be installed remotely, while the front panel mounts conveniently on the dashboard. On the front panel the amber back-lit LCD shows both VHF and UHF frequencies and signal strenghths, and all controls are back-lit for clear readability, with a dimmer switch for nightime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands. See ARA review Vol. 12 Issue 11 (Feb 1990), or AR review May '89.

Cat D-3300

2 YEAR WARRANTY. SAVE $100 **$899**

Cat D-3301 YSK-4700 Extension Cable $49.95

FT-736R VHF/UHF BASE-STATION TRANSCEIVER

The FT-736R is Yaesu's best VHF/UHF transceiver! Designed for the serious VHF/UHF operator, this high-performance transceiver provides 25W output (SSB, CW, FM) on the 2 metre and 70cm (430-450MHz) bands, as well as 10W output on the 6m band. It can be easily expanded to also cover the 23cm (1240-1300MHz) band as required. Features include keyboard frequency entry, 115 memories, 2 independent VFOs per band, separate FM channel knob with selectable channel steps, 2 full duplex VFOs for Satellite operation. IF shift and Notch filters, noise blanker, all-mode VOX, SSB speech processor, GaAs Fet front-ends (430, 1200MHz), high stability TCXO reference oscillator and an in-built AC power supply.

Cat D-2925

*** BONUS MH-1 HAND MIC *SAVE $49.95***

2 YEAR WARRANTY.

- 23cm module (D-2922) **$799**
- High power antenna duplexer (D-3303) **$79.95**

$2495 6m, 2m, 70cm *LIMITED STOCKS!*

DICK SMITH

NSW • Albury 21 8399 • Bankstown Square 707 4888 • Blacktown 671 7722 • Brookvale 905 0441 • Bondi 387 1444 • Campbelltown 27 2199 • Chatswood Chase 411 1955 • Chullora 642 8922 • Gore Hill 439 5311 • Gosford 25 0235 • Hornsby 477 6633 • Hurstville 580 9622 • Kotara 56 2092 • Liverpool 600 8888 • Maitland 33 7888 • Miranda 525 2722 • Newcastle 61 1896 • North Ryde 878 3855 • Orange 616 400 • Parramatta 689 2188 • Penrith 32 3400 • Railway Square 211 3777 • Sydney City 267 9111 • Tamworth 66 1711 • Wollongong 28 3800 **ACT** • Belconnen (06) 253 1785 • Fyshwick 80 4944 **VIC** • Ballarat 31 5433 • Bendigo 43 0388 • Box Hill 890 0899 • Coburg 383 4455 • Dandenong 794 9377 • East Brighton 592 2388 • Essendon 379 7444 • Footscray 689 2055 • Frankston 783 9144 • Geelong 232 711 • Melbourne City 399 Elizabeth St 326 8088 & 246 Bourke St 639 0388 • Richmond 428 1614 • Ringwood 879 5338 • Springvale 547 0822 **QLD** • Brisbane City 229 9377 •Buranda 391 6233 • Cairns 311 515 • Chermside 359 6255 • Redbank 288 5599 • Rockhampton 27 9644 • Southport 32 9033 • Toowoomba 38 4300 • Townsville 72 5722 • Underwood 341 0644 • **SA** • Adelaide City 223 4122 • Beverley 347 1900 • Elizabeth 255 6099 • Enfield 260 6088 • St. Marys 277 8977 **WA** • Canninglon 451 8888 • Fremantle 335 9733 • Perth City 481 3281 • Midland 250 1460 • Northbridge 328 6944 **TAS** • Hobart 31 0800 **NT** • Stuart Park 81 1977

STORES ACROSS AUSTRALIA & NEW ZEALAND

B1261/M1

AWARDS

JOHN KELLEHER VK3DP – FEDERAL AWARDS MANAGER

Grid Square Awards Redrafted Rules

1. (a) The Wireless Institute of Australia Grid Square Award (WIA GSA) is awarded for contact with a minimum number of "Maidenhead" 2 degree x 1 degree grid square locators per band as indicated in (b). Grid Squares are designated by a combination of two letters and two numbers.
   (b) The minimum number of squares needed to initially qualify for each individual band award are as follows:

All HF bands, including WARC bands —		100
50MHz	—	50
144MHz	—	30
432MHz	—	25
1296MHz	—	10
13cm	—	5
all bands above	—	5

2. Only contacts made on or after 1 January 1990 are creditable for this award.
3. (a) Individual band awards are endorsable in the following increments:

— All HF bands	25
— 50MHz	10
— 144MHz + all bands above	5

   (b) Separate bands are considered as separate awards.
4. (a) No crossband contacts permitted.
   (b) No contacts through *active* repeater or satellite devices or any other relay method permitted.
   (c) Contacts with aeronautical or maritime mobile stations do not count.
5. Stations who operate portable or mobile from a different locator than their "home" locator may claim the locator they are *operating portable from,* by either of two methods:
   1. work a station located in their "home" locator;
   2. work at least five different stations outside the portable locator;
   3. on bands 1.2GHz and above, work at least one station outside the portable locator.
6. (a) All contacts for all of the individual band awards must be made from a location or locations within the same grid square, or locations in different grid squares no more than 50 kilometres apart. This will be called the "HOME" locator. Excepting contacts made under the provisions of Rule 5.
   (b) A specified amount of contacts for the basic award needs to be made with stations located in Australia or its territories (ie any prefix VK0 to VK9) as per the table below.

All HF bands	25
50MHz	10
All other bands	1

7. Endorsements will be available on request, ie however you want it endorsed is how it will be done.
8. (a) QSL cards are not required; a certified log extract should be provided with the following information:
   — Date, time, callsign, mode, frequency, grid locator and signal report sent by the station concerned, and grid you are operating from if portable.
   This list should be certified by an official of a society affiliated with the WIA, or by two licensed amateurs, reading as follows: "I/we certify that the enclosed list corresponds with the information contained in the said logbook."
   (b) For those who would have difficulty in getting a certified list, photocopies of your logbook signed by the applicant certifying all the information contained within to be true and accurate can be certified by the Awards Manager.
   Note: All entries must be legible.
9. The cost for each award is Australian $5.00 for amateurs in Australia, or $US5.00 or eight IRCs for those outside Australia. Requests for endorsements should be accompanied by an SASE or one IRC and SAE.
10. This award is very much dependent upon the honesty of the operator. As such, any fraudulent applications will result in the disqualification of the applicant from all future WIA GSAs.
11. Any decisions regarding interpretation of the rules here printed made by the Federal Awards Manager are final and binding.
12. There will also be a standing list of the top five scorers on each band, so people can see just what is possible and what is being achieved. This may encourage those who think they will never reach their target. It will also give those who like a bit of competition something to aim for.

Worked All States Award Rules

1. The WAS (Worked All States) award is available to all amateurs world-wide who submit proof with written confirmation of having contacted each of the 50 states of the United States of America. The WAS awards program includes 10 different and separately numbered awards as listed below. In addition, endorsement stickers are available as listed below.
2. Two-way communications must be established on amateur bands with each state. Specialty awards and endorsements must be two-way (2X) on that band and/or mode. There is no minimum signal report required. Any or all bands may be used for general WAS. The District of Columbia *may* be counted for Maryland.
3. Contacts must all be made from the same location, or from locations no two of which are more than 50 miles apart *which is affirmed by signature of the applicant on the application.* Club station applicants, please include clearly the club name and callsign of the club station (or trustee).
4. Contacts may be made over any period of years. Contacts must be confirmed in writing, preferably in the form of QSL cards. Written confirmations must be submitted (no photocopies). Confirmations must show your call and indicate that two-way communications was established. Applications for specialty awards or endorsements must submit confirmations that clearly confirm two-way contact on the specialty mode/band. Contacts made with Alaska must be dated 3 January 1959 or later and, with Hawaii, dated 21 August 1959 or after.
5. Specialty awards (numbered separately) are available for OSCAR satellite, SSTV, RTTY, 432MHz, 220MHz, 144MHz, 50MHz and 160 metres.

Endorsement stickers for the basic mixed mode/band award and any of the *specialty* awards are available for SSB, CW, Novice, QRP, Packet, EME and any Single Band. The novice endorsement is available for the applicant who has worked all states as a novice licensee. QRP is defined as 10 watts input (or five watts output) *of the applicant only* and *is affirmed by signature of the applicant on the application.*

6. Contacts made through "repeater" devices or any other power relay method cannot be used for WAS confirmation. A separate WAS is available for OSCAR contacts. All stations contacted must be "land stations". Contact with ships, anchored or otherwise, and aircraft, cannot be counted.
7. A W/VE applicant must be an ARRL member to participate in the WAS program. DX stations are exempt from this requirement.

HQ reserves the right to spot call for inspection of cards (at ARRL expense) of applications verified by an HF Awards Manager. The purpose of this is not to call into question the integrity of any individual, but rather to ensure the *overall* integrity of any individual, but rather to ensure the *overall* integrity of the program. More difficult attained specialty awards (such as 220MHz WAS for example) are more likely to be so called. Failure of the applicant to respond to such spot check will result in non-issuance of the WAS certificate.

9. **Disqualification.** False statements on this application or submission of forged or altered cards may result in disqualification. ARRL does not attempt to determine who has altered a submitted card; therefore do not submit any marked-over cards. The decision of the ARRL Awards Committee in such cases is final.
10. **Application Procedure** (Please follow carefully)
(a) confirmations (QSLs) and application form (MCS-217) may be submitted to an approved ARRL Special Service Club HF Awards Manager. ARRL Special Service Clubs appoint HF Awards Managers whose names are on file at HQ. If you do not know of an HF Awards Manager in your local area, call a club officer to see if one has been appointed. If you can have your application so verified locally, you need not submit your cards to HQ via the mails. Otherwise, send your application and cards to HQ, as indicated on the application form.
(b) Be sure that when cards are presented for verification (either locally or to HQ) sort them alphabetically by state, as listed on the back of the application form, MCS-217.
(c) All QSL cards sent to HQ must be accompanied by sufficient postage for their safe return (postage guidelines attached).

(Note: Australian applicants can obtain an application form from and have their QSLs verified by the WIA Federal Awards Manager). ar

CONTESTS

(INFORMATION PROVIDED BY RELEVANT CONTEST MANAGERS)

Contest Calendar

Jan 1992
To 12 Ross Hull
25-26 VHF-UHF Field Day

March
14-15 John Moyle FD
13-15 JA "59" *DX Magazine* CW

RD Contest '91

Late logs were received from the following
VK7HK
VK6GGA
VK6GGD
VK5APD
VK2EY
VK5UE
VK3HZ

These logs, if added to the results, would not have changed the winner, which was VK3 for the second year in succession.

Correction — '91 Novice Contest

Section B Novice Winner — VK4VXX
Score — 150 points
Incorrectly placed in Phone Section

Japan International DX Contest

Sponsored by JA "59" DX Magazine
Box 59, Kamata, Tokyo, 144, Japan

CW Section
Date: 13-15 March 1992
Time: 2300 UTC to 2300 UTC
Bands: Classical DX Bands (No WARC): 80 to 10 metres

Whilst the period of the contest is 48 hours, the maximum a single operator can participate is a total 30 hours only.

Class of Participation:
1. Single operator multiband
2. Single operator 80m
3. Single operator 40m
4. Single operator 20m
5. Single operator 15m
6. Single operator 10m
7. Multiband — multioperator

To call: "CQ JA DX"

Overseas operators will give cypher numbers from 001 to 999. Overseas participants to contact Japanese stations only.

Scoring: 80m: 2pt. 40 and 15m: 1 pt. 20m: 1pt. 10m: 2pt

Total score: Total points multiplied by the number of prefectures worked

Logs to be submitted: CW section: 30 April

Address: Logs and summary sheets to: JA "59" DX Magazine, Box 59, Kamata, Tokyo 144, Japan.

Results of the 15th West Australian Annual 80m CW and SSB Contests for 1991

Congratulations to VK6PGG and VK6BN on winning the CW and SSB sections respectively.

Results for the 3.5MHz CW Contest:

		points
VK6PGG	—	3668
VK6BN	—	2420
VK6AFW	—	2260
VK6ABL	—	2052
VK6BSL	—	938
VK6BWI	—	600
VK6BEB	—	480
VK6JQ	—	340
VK6WZ	—	270

Results for the 3.5MHz SSB Contest:

		points
VK6BN	—	5474
VK6BGF	—	4704
VK6DE	—	4288
VK6ELL	—	4004
VK6AMB	—	3900
VK6IU	—	3562
VK6WZ	—	1560

All participants enjoyed the contests with reasonable band conditions on both nights. One particular comment is the lack of novice operators in spite of slow CW calls by operators. Also the shortage of country stations and "where are all the logs" — the sum total being the above.

C WATERMAN VK6NK

Ross Hull Contest 1991-1992

A couple of minor rule changes have been made in response to comments received, but otherwise the rules are much as proposed in May and October *AR*.

The contest has been shortened slightly. Contest days will now begin at 1800 UTC and so will coincide with local days. The dates are from 1800 UTC on 20 December to 1800 UTC on 12 January. In our time zone, this means three weeks and four full weekends beginning early in the morning on Saturday, 21 December, and ending when you go to bed on the night of Sunday, 12 January.

Scoring will be based on the best seven days for each band. Your best seven days on six metres need not be the same days picked for two metres, and so on. Last year's logs were analysed to improve the balance between the various bands, and the band multipliers have been changed as shown below.

The satellite section has been dropped. There was only one entry last year and there seems to be little point in continuing it.

Most of the big point scores come from DX contacts, so it is in everyone's interest to avoid cluttering the calling frequencies with local QRM. This was a major problem last year and resulted in a number of DX contacts being missed — exactly the opposite of what the contest aims to achieve!

This year a frequency of .150 on each band is suggested for routine contest working. If you have two VFOs, it is easy to keep tabs on "point one", but to shift to .150 for your routine number-swapping. On six metres, avoid 50.110 like the plague. It may be necessary to move just below 50.150 for ZL contacts, but otherwise please use 50.150 and above. For local contacts 52MHz would be even better.

If you are interested in portable operation, make a special note of the last weekend of the contest. The VHF-UHF Field Day will take place on 11-12 January and you can count any contacts for the Ross Hull Contest as well. Please give consideration to heading for the hills over that weekend.

I hope this year's contest will be a roaring success, and I wish all entrants the best of luck.

Ross Hull Contest 1991-1992: Rules

The WIA maintains a perpetual trophy in honour of the late Ross Hull and his pioneering achievements in the VHF-UHF field, especially the discovery and investigation of VHF tropoapheric propagation.

The name of each year's contest winner is engraved on the trophy, and s/he will receive an attractive wall plaque and certificate. The contest is not confined to WIA members.

Duration

1800 UTC Friday, 20 December 1991 to 1800 UTC Sunday, 12 January 1992. Scoring will be based on the best seven contest days (ie 1800-1800 UTC) on each band, as nominated by the entrant.

Sections

A: Multiband. B: Single band.

All entrants will be scored for both Section A and Section B.

General Rules

All bands above 30MHz may be used. Single operator only. One contact per station per band per contest day. Crossband contacts, repeater contacts and satellite contacts are not permitted. Entrants may operate from any location.

Contest Exchange

RS (or RST) numbers plus a two-digit serial number. Serial numbers should begin again at 01 at the start of each contest day. Maidenhead locator numbers may be exchanged as an aid to distance calculation.

Scoring

One point per 100km or part thereof (ie up to 99km: 1 point; 100-199km: 2 points etc). On six metres only, as above, but up to a maximum of 10 (ten) points per contact.

Band Multipliers

6m	2m	70cm	23cm	2.3GHz	Higher
x 1	x 4	x 7	x 10	x 13	x 16

Logs

Logs should cover the full contest period. Distance estimates need only be made for the seven chosen days on each band. Separate logs for each band would help, but are not essential.

Logs must contain the following for each contact:

— UTC date and time
— Station location (if operating portable)
— Callsign of station worked, band and mode
— Location or Maidenhead locator of station worked
— Reports and serial numbers sent and received
— Estimated distance worked and points claimed

Cover Sheet

Logs must be supplied with a cover sheet containing:

— Operator's callsign, name and address
— Station location (if different from the postal address)
— A scoring table set out as the example below
— A signed declaration that the station has been operated in accordance with the rules and spirit of the contest

Deadline

Logs must be received by Monday, 17 February 1992. Early logs would be appreciated. Post logs to WIA Ross Hull Contest Manager, PO Box 300, Caulfield South, Vic 3162.

Disqualification

The normal rules apply. Entrants may be disqualified if there is evidence that claimed contacts were not actually made, or if logs are incomplete or illegible.

Awards

The overall winner will be the top scorer in Section A. Awards will also be made to the top scorers on each of the following bands: 6m; 2m; 70cm; 23cm; 13cm; microwaves (bands above 3GHz).

Note on Calculating Distances

Absolute accuracy is not needed. All you need to know is whether the distance is above or below the nearest multiple of 100km. "Ruler and map" estimates will often be quite good enough for this. Better estimates can be made from six-digit Maidenhead locators, using simple computer programs published in December 1990 and January 1991. The contest manager reserves the right to correct distances on the basis of computer calculation, and his decision will be accepted as final.

Sample Scoring Table

Ross Hull Contest 1991-1992: Log of VK0XXX

6 metres		2 metres		70cm		etc
Date	Score	Date	Score	Date	Score	
29 Dec	xxx	27 Dec	xxx	29 Dec	xxx	
7 Jan	xxx	31 Dec	xxx	6 Jan	xxx	
10 Jan	xxx	6 Jan	xxx	9 Jan	xxx	
etc						
Total	xxx		xxx		xxx	
Mult	x 1		x 4		x 7	
Total	xxx	+	xxx	+	xxx = xxxx	

VHF-UHF Field Day 1992

In the past, this Field Day has been run over the Australia Day weekend, which is the last weekend of the school holidays. Last year it was suggested this could clash with family commitments and an earlier date would be better. There is also a good chance of more amateurs being on holiday in mid-January than there would be at the end of the month.

So the Field Day has been moved to 11-12 January 1992. This coincides with the last weekend of the Ross Hull Contest, and any Field Day contacts can also be counted for the Ross Hull Contest. This weekend will also be an ideal opportunity to add to your collection of locators for the new Grid Square Award. So there are three very good reasons to keep that weekend free, and go portable if you can!

Scoring for the Field Day will continue to be based on locator squares, but the band multipliers have been brought into line with those used for the Ross Hull Contest.

Duration

0200 UTC Saturday, 25 January to 0200 UTC Sunday, 26 January.

Sections

A: Portable station — single operator
B: Portable station — multiple operator
C: Home station

General Rules

All modes and bands above 30MHz may be used. Repeater and crossband contacts are not allowed. Entrants may not operate from more than one locator square. You may work stations within your own locator square.

Contest Exchange

A serial number beginning at 001, plus Maidenhead locator. RS or RST reports may be exchanged but are not required in the log.

Repeat Contacts

Stations may be worked on each band once every four hours.

Scoring

Home stations one point per contact. Portable stations two points per contact. Three points if both stations are portable.

6m	2m	70cm	23cm	2.3GHz	Higher
x 1	x 4	x 7	x 10	x 13	x 16

For each band, multiply the points score by the number of locator squares worked on that band, then by the appropriate band multiplier. For example, on two metres, 20 contacts x 4 squares x 4 = 320 points. See the sample scoring table below.

Awards

The overall winner will be the highest all-band scorer in Section A. Awards will also be made to the highest scorer on each band in Section A, and the highest scorers in Sections B and C.

Logs

For each contact, UTC time, band, station worked, serial numbers and locator numbers exchanged, points claimed. The front sheet

should contain the name, address and call-sign of the operator, station location, section entered, and a scoring table as follows:

Band	Points	Squares	Total (points x squares)
6m	xxxx	x xxxx	= xxxx
2m	xxxx	x xxxx	= xxxx
Overall Total			xxxx

Entries

Post logs to the Manager, VHF-UHF Field Day, PO Box 300, Caulfield South, Vic 3162. Logs must be received by Monday, 24 February 1992. Early logs would be appreciated.

JOHN MARTIN VK3ZJC
ROSS HULL AND VHF/UHF FIELD DAY CONTEST MANAGER

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VHF/UHF – AN EXPANDING WORLD

ERIC JAMIESON VK5LP – PO BOX 169 MENINGIE 5264

All times are UTC

The Beacons

Last month I published the list which normally appears in December, so for now you will need to be content with any alterations or additions.

A letter from John Miller ZL3AAU brings us up to date on the state of beacons in New Zealand. They currently stand at:

50.043	ZL3MHF	RE66	Aylesbury	50w	A1A
50.0525	ZL3MHB	RE57	Greymouth	30W	A1A
51.020	ZL1UHF	RF73	Nihotupu	25W	F1
51.030	ZL2MHB	RF80	Napier	10W	F2
52.510	ZL2MHF	RE78	Mt Climie	4W	F1
50.0475	ZL2???	RF70	New Plymouth was approved on 11/11/90, but is not operational.		

ZL3MHF runs 50 watts switched alternatively to two bi-directional beams NE/SW and NW/SE. The identifier is ZL3MHF twice, then carrier followed by either NW or NE twice. The beacon has been operational on 50MHz for about 12 months.

P29BPL has been noted on 50.0195. The five JA beacons have been heard this month, and a frequency check made. They are JA2IGY on 50.009, JA6YBR 50.016, JA7ZMA 50.026, JA7YYL 50.047 and JG1ZGW 50.049MHz.

VK7RSB on 50.057 is shown in the FTAC list, but I have no details. For more information on the proposal for 50MHz beacons in Australia, I refer you to the FTAC Notes in *AR* this month. Ron VK4BRG is testing a beacon on an initial frequency of 50.0775; if successful, consideration will be given to the use of a frequency following FTAC guidelines and whether the beacon will be moved to another location.

A new Adelaide beacon can be found on 432.450MHz signing VK5ACE at present. It is radiating a good signal into Meningie. In the near future it will be shifted to Mount Lofty and housed with another new beacon on 1296.450MHz. More details later.

Six Metres

This band can still bring forth surprises. Peter VK8ZLX had exciting times. Some of his notable contacts included: 22/9 BV2, 23/9 V85; 28/9 PA3; 11/10 JD1; 16/10 OZ1, DL8, SM7, OH2, GW0, PA3, G4, OE and LA between 0740 and 1001. On 17/10 between 0831 and 1026 he worked ON4, DK, OZ1, PA3, GW0, LA9, G6 and SM. 18/10 between 0641 and 0747 DL7, IV3, ON1, PE1, YU3 and DK. 19/10 at 0249 KL7, and from 0551 OZ, OH3, SM7, OZ5, OE, DL, PA, FC, IK, YU3, YU2 and GJ4. All these prefixes for a total of 217 European contacts!

More Europeans

First reported European opening appears to have been on 28/9 when VK3OT heard and called ON4ANT. VK8ZLX worked PA3UI at 0749, VK6PA into southern UK around 0900, and VK4FP was reported as having worked 9H1JN, 9H1AW and DK3UG. (Last year the first opening was on 19/10/90). Other same day's news included four VK6s having worked JT1CO in Mongolia. On 11/10 I heard that VK4FP had worked SV and 9H1, and VK8RH worked Italy. On 13/10 VK4FP to YU, G and F. During mid-October, for several days, JA, KG6 and VS6 had also been working to Europe, including Gibraltar on 14/10. On the morning of 15/10 JAs were working Brazil on what appeared to be the long path which would have to be over Australia. VK4s from Brisbane to Townsville were there on Es.

Ultimately, some operators in lower climes were treated to European contacts, but not until 18/10. JAs had been into VK5 all day, and late in the afternoon strong backscatter CW signals were noted from VK2QF, VK2BBR, VK2EDB, VK2FLR, VK3OT, VK3LK, VK3AMZ, VK3AMK, VK3AKK and VK5NC, plus many strong video signals peaking around 330 degrees. At 0643 VK8ZLX was working DL so there were possibilities for the southern regions. The JAs were already working Europe.

On 10 metres at 0906 OZ1BVW said he was hearing signals from VK and JA on six metres. Then a report came in that VK4HT had worked YU3. Soon after, the band from 50.080 to 50.130 erupted with VK2s and VK3s calling Europe and working stations split frequency on CW. Prefixes worked included GJ4, DL7, DL2, IV3, PA0, OZ1, ON2, PA3 PA2, PA4, DK8, ON4, ONI, DM8, DK8, GM0 and YU3, the latter being a rare catch. For good measure, some worked NI6E in Hawaii! Between 0730 and 0841 I noted strong video on 49.224 and was later told this could have been from France. Not knowing this, I did not call — perhaps I had the only opening to France — no French stations were heard or worked by anyone else, so I will never know if I missed an opportunity!

Ray VK3LK sent a letter to say he worked 9xOZ, 6xPA, 3xPA, 3xON, 3xSM, 2xDL and GJ4, working 24 and heard YU and LA. Ray commented that the opening peaked around the Heywood/Hamilton area, with less being heard and worked to the east and west. VK3OT worked 21 stations, and I have no details of the tallies from the Melbourne stations. Trevor VK5NC in Mount Gambier worked three stations, so by the time signals got to him they were tapering off. It is doubtful whether any were heard in Adelaide; certainly Roger VK5NY missed out and there was not so much as a peep to be heard here at Meningie. It was most frustrating to hear the others working so many areas and VK5 missing out.

As always, Queensland receives its fair share of contacts. In the Brisbane area, John VK4ZJB reports various stations were involved in contacts on 2/10 to W5, W6 and ZK1CG; 4/10 K5, AA6TT/0; 6/10 WA4 and WB4, V73AT; a prize catch on 8/10 between 0400 and 0500 was JT1CO in Mongolia, with signals varying from 5x9 to 5x1. At that time there were wall-to-wall JAs; 10/10 at 0320 JT1CO again, then from 0900 to 0930 9H1JN and 9H1AW with signals to 5x9 — Lance VK4ZAZ worked them whilst he operated mobile! 17/10: OZ1LO in FK30 at 529 to VK4ZJB for four minutes only.

Other good contacts on 14/10 commenced with Geoff GJ4ICD to Mike VK2FLR. Mike said it was an astonishing five-minute opening into Sydney with signals to 599, before moving to VK4JH and VK4RO. This was apparently the first European contact to Sydney and may well constitute a new record from the UK to VK. Mike wrote:

"The surprise for me was that, while we had strong 48.25 and 49.75 TV at the time, there was no in-band frame buzz, usually a bad sign. Geoff's signal shot up out of the noise on 50.110, but lasted only a few minutes. No other Europeans were heard here, but we did hear the VK4s on Es working in that direction. On 18/10 I could hear VK2QF near Mudgee working into Germany, Denmark and possibly Norway, but nothing was heard in Sydney. On the night of 16/10 I spoke to G3HBR on 10 metres, who reported getting a recognisable picture from DDQO in Toowoomba earlier in the evening. Apparently the 46.172 video was the strongest he had ever heard it.

Reports were coming in of the north Queensland operators working W5 and W6, also to Malta and Greece. Hawaii was working into the eastern states, plus VK5 and VK8. VK6PA had a wide coverage of contacts to Europe. Joe VK4JH is often a strong Es signal into VK5. It

was noted on 17/10 that he had worked BV, BY, VS6, JA, FK, 3D2 for starters!

On 19/10 CN8FT in Morocco was worked by VK4HT, VK4BUN, VK8RH and others in each of those states. That was a good catch. KL7NO was into VK5 at 0255 on 19/10. More thrills came on 27/10 when the Brisbane gang from 0740 had ON1BV on CW, SV1SV, SV1DH, SV1AB, SV1UN, SV1EN and SV0BY, all on SSB with signals to 5x5.

On 28/10 VK4RO said W5 came into Adelaide during the morning for a brief CW stint. Large solar flares produced an aurora on 29/10 from 0500. JAs were 579 at 0550 with the characteristic garbled auroral sound. They came from JA1, 2, 3, 7, 8, 9 and 0, and remained available on CW and SSB until 0940 when they quickly disappeared. All five JA beacons were audible during this opening, peaking to S6. Some contacts were made from VK5 to VK2 and VK3 using the auroral path.

Sarina Report

Ron VK4BRG at Sarina continues to pull in the DX, slowly but constantly adding to his very respectable countries score. The JAs and KH6s continue to dominate the openings, so omitting them the following is a selection of his contacts.

26/8: 0028 to 0218 17 W6 and W5, with most from Texas; 0128 K1HTV in Maryland, assisted by Es; 30/8: 2349 K5CM; 3/9: 0005 to 0203 fourteen W5 in Texas and Oklahoma; 5/9: 0909 BZ4SAA — Ron commented that he had met the operator, Kang, on his visit to China, so was very pleased to make a 6m contact with him; 10/9: 0022 WQ5S; 12/9: 0247 WQ5S and K5CM, 0831 KH4AF Johnson Island and 1008 JD1BFI Ogasawara; 19/10: 0822 to 0934 GJ4ICD, GW4EAI, six PA, 12 G; 21/10: 0121 to 0155 three W7 in Oregon, one W6, one W7 in Arizona; 22/10: 0038 NI6E, 0042 KH6IAA, 0043 to 0216 14 W6, W7 Arizona and W7 New Mexico; 25/10: 0059 K7GGJ, 0112 WB7PEK, both in Oregon; 26/10: 2244 to 2321 six W6. (A late report indicates Ron worked to W1 again on 29/10, and that's a long way ... 5LP).

Ron added there has been a high degree of good propagation in the northern hemisphere, with the east-west path from W working into the north Pacific. He had heard JAs working South America, but little of this filtered down to the south-west Pacific, though ZL had had many more openings to W than he had during the latter part of October.

The Hargraves Report

Nev VK2QF sends a brief report which indicates he heard JT1CO as a beacon on 10/10 at 0345 but could not break through. On 18/10 there were many strong video indicators below 50MHz which led to a European opening between 0831 and 0958 when he worked DL8HCZ, SM7AED, OZ1LO, OZ8RW, SM7FJE, SM7SCJ, SM7BAE, OZ2LD, DL8HCZ (SSB), PA2VST, PA0LSB and PA3BFM. These were new countries and gave Nev WAC.

Nauru on Six Metres

Stephen Pall VK2PS, the DX editor, forwarded news from Jack T30JH that Brian C21BR is to activate Nauru on six metres for two years from 3 November 1991, using equipment lent by Peter VK4APG and a beacon constructed by Nev VK4ZNC and operating on 50.110. The equipment will run 100 watts of SSB. Nauru should be within multi-hop Es distance of Australia. Liaison will be via 28885kHz.

Using 28.885MHz

By the way, I would be a lot happier about 6m F2 contacts in general if they were fully completed on 50MHz rather than on 28.885. I recently heard a VK on 28.885 say to a European: *"You heard me calling CQ — Yes. — I heard you calling CQ, therefore it is a contact!"* Really!

Only this last week I heard a JA receive his 6m signal report via 10 metres. In the past there have been other instances. Let us all play the game fairly. In the future I will be increasing my surveillance of 28.885, and any such breaches of operating conduct will be written in my notebook for future reference and a query referred to the operator, in the event the contact is claimed for the Standings List. So beware!

Robert Greenwood VK4NG

My snipped in October *AR* regarding Bob VK4NG and early JA contacts has prompted two readers, Lance VK4ZAC and Noel VK4ZAR, to write filling in the information regarding the equipment used by Bob. Each agreed that his receiver consisted of a 6AK5/6J6 converter feeding into an AR7 receiver as the tunable IF. The transmitter used a 6SG7 crystal oscillator driving a 6V6 buffer to an 807 running 60 watts AM, modulated by a pair of zero bias 807s. Lance said he had a four-element Yagi at 35 feet and Noel said he finally settled for what he called his "Comical Quad". Noel enclosed a copy of a card from VK4NG for a contact on 9/11/57. Thank you for your interest gentlemen.

Lance VK4ZAZ added that in 1958 he, VK4ZAR and VK4NG worked literally thousands of JAs and scores of Ws. Lance said he was probably the first Z call to work overseas and had a couple of JAs challenge the validity of his call as they could not see how we had gone through the alphabet so quickly! He said *"try explaining that over a considerable (at the time) language barrier."*

Incidentally, Noel commented that he had a similar set-up to VK4NG, but used a BC312 receiver. In 1958/59 Lance varied his similar equipment to include speech clipping in the modulator and two 807s in the PA. His tunable IF was an AR8. These references bring back feelings of nostalgia to me, as my first 6m rig in 1960 was a pair of 807s modulated by a pair of zero bias 809s with high level clipping and filtering. One hundred watts of RF modulated by 100 watts of audio, with the appropriate clipping and filtering to keep the signal from spreading, did indeed result in a very potent signal. For receiving I used a Kingsley KF/C610 ferrotuned tunable converter (with considerable drift and still in my possession) and an AR7 as a 10.7MHz IF. Those were the days!

News from England

Ted Collins G4UPS sends his monthly notes to Radcom, QST and up to a dozen other countries, so is interested in exchanging notes with me. His brief letter included a note which read *"I have just received a beautiful certificate for the VK3 award working VK3OT for a VK3 distance record."* In these depressing days, isn't it nice to read that someone has received something that brings them joy. Congratulations!

Ted also included many pages of 6m information covering August and September, plus a world beacon list and a list of 25 callsigns with the prefixes and grid squares of YT and YU stations which had been worked to 2/9/91. Also, keyers are often heard from V51E on 50.102 and TR8CA on 50.092. It is interesting to note that his list of regularly heard beacons includes VS6SIX on 50.0745.

The following information is condensed from that supplied by Ted G4UPS. The 4N3SIX beacon in Slovenia is now on 50.016. 9Q5EE has gone from Zaire, leaving only Gus 9Q5TE who runs two watts to a three-element Yagi. The French beacon FX4SIX is now on 50.314MHz. GM4DGT will activate TA4 (Turkey) in December 1991. Doug ZP6XDW has changed his callsign to ZP6CW. The 6m rig and antenna used by 5H1YK has been handed on to 5H3RA who will use it. Kevin ZC4KS from Cyprus is now on the band.

Dave 9L1US went QRT in October and the beacon on 50.091 will change to the club callsign 9L1SL. Dave may return to Africa and operate from Botswana A22. Malawi is likely to have two active stations, 7Q7CM and 7Q7LA. PY5CC has been trying some special callsigns lately, including PX5A, PU5A and ZX9A. Jo W3JO will activate Jamaica as 6Y5/W3JO until 16/12/91. Gerard 5V7JG (also F2JD AND CE0ZZZ) runs 25 watts to a five-element and expects to be in Togo until February 1992. Two possible stations in Lebanon are Roger LA4GHA/OD5 and Samir OD5SK.

Richard G4CVI, Paul G4CCZ, Mike G3SED and Mike G3JVL will operate from Guyana and Brazil for two months commencing April 1992. They will use their G callsign/8R1 for Guyana. Permits to operate from OK are to be issued soon.

Prefixes heard or worked from England during September included CX4, PT7, LU8, LU7, CX8, CX9, FC1, 7Q7 CT1, 4N3, YU3, I7, OE3, IK3, SV1, I2, IK4, SM7, DJ2, V51, A22,

IN8, 9Q5, VK6, VK8, Z23, DJ0, EA3, ZS6, ZP6, TU2, 9L1, ZS9, CT0, OZ7, OZ4, YT2, TU4, OH1, OE6, DL7, I1N, 9J2, TR8, 5V7, ZS4, 9H1, 9H5, OE6, SM1, SK6, LA9 representing 33 countries!

Six-Metre Calling Frequency

Bill VK5ACY has expressed concern that there does not seem to be a recognised 6m calling frequency for Es contacts, particularly during the peak summer period. He mentions that last year there was strong opposition to working Es anywhere near 50.110 due to possible interference to long-haul DX.

Bill suggests a calling frequency of 50.200 as being far enough from the low end. That's true, but there is a problem that 50.200 is the upper limit of the 50MHz segment for the eastern states, so the sidebands from a signal could be outside that limit. As there is presently only limited operation between 50.150 and 50.200, why not use that portion for domestic contacts with a calling frequency of 50.160. This would allow an area for contacts to be moved higher in frequency after making initial contact on the call frequency. Currently I tune to 50.160 and above when checking the band for signals, so it would mean no change to my operating habits. By the time you read this it will be December and the Es "season" so why not try it this year and see what happens. The Ross Hull Contest could be conducted from 50.150 to 50.200 without worrying anyone seeking DX from other countries. Then, of course, do we want to abandon 52MHz? Your thoughts please.

Two Metres and Above

There has been a reasonable degree of activity, mainly on 144 and 432MHz. Mark VK5EME said regular contacts have been with VK5MC, VK5KAF, VK5ACY and occasional VK3s on 144, and with VK5ZVA on 432. Bill VK5ACY on Kangaroo Island recently erected a 12-element DL6WU 2m Yagi at 19 metres high and with 100 watts has worked many VK3s plus VK6WG at Albany and VK6AS at Esperance.

Mark said Channel 5A in western Victoria is a good indicator for 2m band conditions providing the picture is received in colour and with a very strong sound carrier on 143.750MHz.

Conditions on 432 to Horsham in Victoria have been poor in the evenings and good in the mornings. The Ballarat beacon on 432.535 has been heard around 1200 to 1400 UTC, with signals to S8 but no stations worked.

Phil VK5AKK at Hallett Cove has been testing with Wally VK6WG at Albany on all bands from two metres to 1296MHz to establish the changes due to propagation variations. Ducting has been found to be very poor to Albany from north of Adelaide in the evenings and much improved after sunrise, which is at variance with conditions at Hallett Cove.

Mark VK5EME expects to operate portable from the Adelaide Hills during the summer months, probably late December through early January, operating from 2200 in the mornings and 0830 in the evenings. He will run 100 watts on 144, 10 watts on 70cm, 10 watts on 23cm and 0.5 watts on 13cm. He is interested in working VK3 on 23cm and 13cm from his portable site. Mark also listens most mornings from 1930 to 2030 on 144.1 and 432.1, mainly in the VK3 direction, looking for random contacts. David VK3AUU was a reliable morning signal about two years ago. VK5AKK is also considering portable operation this summer.

EME Information

Chris VK5MC advised of two contest weekends, 26-27 October and 23-24 November with bands from six metres to 10GHz in use. During the October tests nothing was heard at Meningie, but VK5EME heard W5UN on 27/10 and W5UN and KB8RQ on 28/10. VK5AKM heard CW on 432.007.

Closure

Space has run out so I must close. With Es to the fore as you read this, operators can enter the Ross Hull Memorial Contest and should be able to renew former friendships. Don't overlook Es 2m contacts when the skip shortens on six metres.

Best wishes to all readers for Christmas and new year. This month I start my 23rd year of writing this column. My sincere thanks to all those who have supported me with information over the years.

Closing with two thoughts for the month: "Don't knock the weather. If it didn't change once in a while, nine out of 10 people couldn't start a conversation," and "You may think seat belts are uncomfortable — but have you ever tried a stretcher?". 73 from The Voice by The Lake. ar

FTAC NOTES

JOHN MARTIN VK3ZJC FTAC CHAIRMAN

Yet More Records

The first national long-path record for 50MHz, set by VK3OT and 9Q5EE, has been broken. A long-path contact between VK6JQ in Broome, and TL8MB in the Central African Republic, has bee verified, the distance being 28,397km.

The new VK4 long-path record, set by VK4ZAZ and 6W1QC, has now been superseded. On the same day he worked Lance VK4ZAZ, 6W1QC also worked Joan VK4BJE and Bill VK4KHZ. The distance is 21,754km. Congratulations especially to Joan for becoming the first YL to hold a VHF/UHF record.

A new Digital Modes record has been set by Robert Black VK2BBR, who worked Yutaka Katoh JH1WHS on 28 April 1991, a distance of 7320km. Yutaka must be very active on RTTY as this is his third consecutive new Digital Modes record. Congratulations to him and to Robert, who also set a new VK2 6m record recently with the very active 6W1QC.

This month there is also a new national EME record for the 2m band. Arie Groen VK3AMZ has broken the record set 25 years ago by working VE1BVL on 22/6/91, a distance of 17,683km. Congratulations Arie.

Rumours

The new long-path records on six metres have caused some controversy, and I believe there have been some rumours about the validity of several recent 6m records. A few points to set the record straight:

1. The verification requirements for records are quite stringent, including evidence required to determine whether or not the contact was made by long path. No record is granted unless there is absolutely no doubt the contact was made as claimed.
2. Verification of long-path records takes into account conditions, time of day, other stations heard or worked, corroboration from other stations and known characteristics of the path.
3. The short path records still stand. My apologies for omitting them from the last *Call Book* listing and possibly giving offence to the holders of those records. This oversight will be corrected when the list is published again in February *AR*.

50MHz Beacons

Thanks to VK3TAF, VK2JSR, VK4BRG, VK4JHM, VK5LP, VK6HK and WESTAC for comments received on the 50MHz beacon proposal.

Federal Council has approved a proposal to make 50MHz beacon frequencies available immediately in the eastern states. One frequency per call area will be used initially, with the possibility of extra — possibly co-channel — beacons later. VK3SIX is already operating on 50.0535 and VK7RSB is on 50.057. Frequencies for other call areas will be organised as soon as possible.

Beacon frequencies will be co-ordinated nationally to minimise interference. Future allocations within the DX window will be for eastern state beacons only.

Federal Council also formally adopted the following beacon standards:

(a) Beacons should transmit 24 hours per day.

(b) Beacons should identify at least twice per minute.
(c) Identification content should be minimal, either callsign only or callsign plus locator.
(d) The period between identifications must be key down.
(e) Identification should be 850Hz FSK; however, keyed CW (A1A) is also acceptable on frequencies below 52MHz.
(f) Antenna polarisation should be horizontal.
(g) Frequency accuracy and stability should, if possible, be one part in 10^6.
(h) Beacon ERP should be consistent with user power levels on the band in question.
(i) Beacon frequency spacing may be as close as 1kHz.
(j) Frequency sharing may be used on 50MHz if the beacons concerned are in null zones to each others. ar

ALARA

JENNY ADAMS VK3MDR — 70 KANGAROO GROUND RD, WATTLE GLEN 3096

Goodness!! Where has the year flown? It seems like only last week I took on this job. Season's greetings to all; may you have a peaceful and joyous Christmas.

This month saw the passing of a well-known and loved ALARA member, Joy VK2EBX.

Thank you to Meg VK5AOV for compiling the following with information supplied by Joy's daughter Janet, Doug Tamblyn VK5PDT, Marilyn Syme VK3DMS, Christine Taylor VK5CTY and Neville Wilde VK2OR.

Joy Collis VK2EBX
(formerly VK2VJV and VK2KJC)

Born in London, Joy migrated to Australia in 1950. Here she met her future husband, Dan, married and raised a family of three boys and three girls in various somewhat remote areas of rural Victoria and New South Wales. She taught her children by correspondence until the family eventually moved to the Wellington region in 1970.

It was soon after this that she was introduced to CB radio — an interest which soon led her on to amateur radio, gaining her full licence a few years later.

Joy also held the position of clerical assistant at the Yeoval Central School from 1981, and during those years she began to write poetry, winning the Bronze Swagman Award for bush verse in Winton, Queensland, in 1983. Her verse has also been published in *Amateur Radio* and the *Alara Newsletter*, giving much pleasure to her readers!

Joy was a wonderful ambassador for amateur radio, both privately and as an active member of the Orange Amateur Radio Club, of which she was an Honorary Life Member, and of course for Alara. From November 1987 until last year when she became unable to continue for health reasons, Joy was the Alara publicity officer and *Amateur Radio* correspondent, tasks which she undertook willingly and with flair.

Before her illness prevented her from travelling, Joy and Dan were able to visit DX friends in Canada and England, as well as revisiting her childhood haunts. Such was her charisma that she had made friends all over the world.

Joy had a challenging life — living through war-torn London, the illness and death of her mother before she was 20, raising six children under rather difficult circumstances in the early years, the death of two sons (1980 and 1985) and of her husband Dan in 1991, and most recently fighting cancer. Her faith in God and her positive attitude brought her through those trials, not without scars, but with hope and a sense of humour. She was always regarded by her children with love, fondness and respect as a good mother.

Joy's charming manner, dignified bearing and genuine interest in her friends and associates endeared her to all. She will be remembered with affection and respect by all who were privileged to know her.

Snippets

Maxie DJ4YL and her sister, from all accounts, enjoyed their visit to Australia. In Sydney, Dorothy VK2DDB entertained them with a trip to Ku-ring-gai Chase, where they saw native flora and fauna, including a goanna, at very close range, followed by a barbecue lunch. In Victoria, she had a luncheon with some of the VK3 ladies, followed by a trip to Frankston with Erica VK3AEB.

Christine VK5CTY also had a luncheon with the VK3 ladies on her visit to Melbourne in September. It is nice to be able to put a face to a voice!!

Yea, we did talk a lot.

Congratulations to Anne Minter VK4ANN on receiving WIAQ merit badge.

Thank you to Dorothy VK2DDB for writing this column for the past four months.

More next month. ar

AMSAT

BILL MAGNUSSON VK3JT - 359 WILLIAMSTOWN RD YARRAVILLE 3013
PACKET: VK3JT@VK3BBS

National Co-ordinator
Graham Ratcliff VK5AGR
Packet VK5AGR@VK5WI
Please take note of the AMSAT information nets:
AMSAT AUSTRALIA net:
Control station VK5AGR
Check-ins commence at 0945z
on Sunday nights
Bulletin commences at 1000z
Frequencies 3.685MHz or 7.064MHz. At present 7.064MHz is used.
AMSAT SW Pacific net:
2200z Saturday on 14.282MHz.

Experienced satellite users and newcomers alike are welcome on the nets. A large body of experience is on hand to answer queries. Listen to the WIA Divisional broadcasts for regular AMSAT information.

AMSAT Australia Newsletter and Computer Software:

Satellite users, whether experienced or newcomers, will benefit by subscribing to the AMSAT Australia newsletter and software service. The newsletter is published monthly by Graham VK5AGR. Subscription is $20 payable to AMSAT Australia, addressed as follows:

AMSAT Australia
GPO Box 2141
Adelaide 5001

The newsletter provides up-to-date information on all current and planned satellite activity. Graham also provides a first class software service for satellite users. New software is reviewed regularly in the newsletter.

MIR News

I've been getting a lot of requests for information on MIR activity (or lack of activity). It appears they've been having some trouble with their TNC and, because of this, activity has been restricted to voice QSOs, mainly with VK3CFI to help sort out the problem. Maggie reports that Sergei managed to leave a message in her PMS a few days ago, so it may not be too long before the problem is sorted out and the system may well be back on line when you read this. Keep listening on 145.500MHz.

Remember also that operating schedules on board MIR are subject to change and they have a very busy day-to-day routine.

The other reason why activity appears to lapse periodically is they keep Moscow time for all on-board activities. This means that, as our local access times slip back daily, their recreation periods don't coincide with the passes over VK. MIR will appear most active

to us when these recreation periods coincide with early to late evenings our time. Don't despair, the orbit of MIR is such that the cycles will repeat every couple of months. When operational, the packet system is normally turned on for continuous activity. It can be used for PMS message forwarding or digipeating around VK/ZL.

UoSat News

Following a period of inactivity the news bulletins on UoSat-2 (UO-11) are to be revamped. With the advent of the new UoSats there has been a lot of activity at the University of Surrey recently, and old faithful UO-11 has been neglected to some extent. A new news co-ordinator has been recruited and we can look forward to regular news updates on Uo-Sat-2 from now on. Rumour has it that a new UoSat is planned for launch in 1992. It will be similar to UO-14 with an open access 9600 baud BBS and no doubt using broadcast protocol. If this is successful we will have five operating digital mode satellites in orbit.

FUJI News

FO-20 has had a new software upload and is working again, mostly on digital mode. The new software is designed to make operating easier. I'd like to hear from any FUJI fans who have tried it. Is it any easier? Is it any more regular in operation?

STS-35

In December 1990 many Australian amateurs made contact with Ron Parise, WA4SIR on mission STS-35. They'll be happy to know their QSL cards are finally being processed. The people at NASA are hoping to have them all out in a couple of months.

OSCARs ain't OSCARs

A recent news item stated that the US Navy had "blasted" a satellite called OSCAR-22 out of the sky in a simulated test of some of its gadgetry. Don't panic, they're not practising on us! The US Navy has long had a series of navigational satellites which they call OSCARS. Thankfully it was one of them.

Change of BBS

Due to high noise at this QTH I've had to change to another local BBS. Please note the change to my packet address, which is now VK3JT@VK3BBS.

ar

Satellite Activity for August 1991

1. Launches

The following launching announcements have been received:

Intl No	Satellite	Date	Launch Nation	Period min	Apg km	Prg km	Inc deg
1991 —							
053A	MOLNIYA-1	01 Aug	USSR	12H17M	40681	653	62.9
054A	STS-43	02 Aug	USA	90.6	329	309	28.4
054B	TDRS-F5	01 Aug	USA	710.3	34390	793	0.0
055A	INTELSAT 6 F-5	14 Aug	ESA	743.8	35789	5881	3.3
056A	METEOR 3-5	15 Aug	USSR	109.4	1219	1196	82.6
057A	PROGRESS M-9	20 Aug	USSR	88.6	246	192	51.6
058A	RESURS-F13	21 Aug	USSR	88.8	272	195	82.3
059A	COSMOS 2154	22 Aug	USSR	104.9	1021	991	82.9
060A	BS-3B	25 AUG	Japan	664.0	37491	179	28.7

2. Returns

During the period 59 objects decayed, including the following satellites

1990-081C	PRC 32	24 Jul
1991-038A	PROGRESS M-8	16 Aug
1991-048A	COSMOS 2152	23 Jul
1991-052A	RESURS-F12	08 Aug
1991-054A	STS-43	11 Aug

3. Notes

1991-056A Meteor 3-5

This meteorological satellite was launched by the USSR using the TSIKLON booster rocket. The spacecraft also carries a US built Total Ozone Mapping Spectrometer (TOMS) on a joint US and Soviet mission to study the ozone layer.

BOB ARNOLD VK3ZBB

EDUCATION NOTES

BRENDA EDMONDS VK3KT – PO BOX 445 BLACKBURN 3130
WIA FEDERAL EDUCATION CO-ORDINATOR.

At the quarterly Executive meeting in October, the first formal steps were taken to set up a committee to monitor and manage the examination question banks. The establishment of this committee was required under the terms of the agreement with DoTC.

Those who have taken any part in producing examination papers under the first devolved system are aware that the existing banks as supplied by DoTC are inadequate and have an uneven distribution of questions across the syllabus. It is the aim of the committee to extend the scope of the banks by adding more questions to the sections which are under-represented, and to improve the quality of the banks by deleting controversial questions or rewriting them to an approved standard.

It was decided that before any question can be added to the bank it must be approved by at least three suitably qualified persons. Proposed amendments must be approved similarly. It is expected the additions or amendments will be submitted to DoTC for final approval.

This is going to involve considerable time and effort on the part of the committee. Possible questions provided by any member will have to be referenced to the appropriate section of the syllabus and then circulated to at least two other committee members. Only those passing all three will be eligible to be added. Any which do not get the seal of approval will be put aside to be reworked for later use as, at this stage, the top priority is to extend the range of questions.

I have asked previously in this column for any readers who have a collection of questions available to please consider submitting them for possible use. I will be acting as Secretary for the committee, and will be very happy to receive any or all that may be sent. I have recently been through the banks to find the areas of greatest need, so questions on the following topics would be most welcome:

* Any regulations questions;
* Novice level — any safety questions; electromagnetism; basic electron flow distinction between resistance and impedance; quality factor; piezoelectric effect; diode and zener diode theory; applications of amplifier and voltage regulator ICs; practical limitations of use of solid state devices; FM transmission and reception; common use circuitry in transceivers; the sunspot cycle; methods of feeding antennas; recognition of symptoms of interference.
* AOCP level — any safety questions; sources of EMF other than cells; electromagnetism; shielding in transformers;

power supply filters;
voltage regulation;
point contact diodes;
PLL VFOs;
oscillator stability;
speech processing system principles;
VHF/UHF techniques;
direct conversion receivers;
directive antennas;
mobile antennas;
dummy loads;
solar activity;
ATV/SSTV.

A note of warning to instructors and candidates: please *do not* use this list as a guide to topics that can be omitted from study on the basis that the banks are short of questions on them. I have selected areas where I see most need for improvement, as well as areas of deficiency. Already questions have been included which were not supplied by DoTC. But there is still much to be done, and any assistance will be greatly appreciated.

I am happy to report that most of those who have used the WIA Exam Service so far have found the system is working smoothly and efficiently. It does seem, though, that extra time must be allowed when ordering examination materials to compensate for possible slow action on the part of Australia Post.

May I take this opportunity to wish all readers the compliments of the season, and my best wishes for the forthcoming year. ar

HOW'S DX

Stephen Pall VK2PS – PO Box 93, Dural 2158

By the time you read this, we will have reached the last month of this very eventful year. Politically there were a number of significant changes in the world. We even had a short war in the desert.

The amateur fraternity has enjoyed one of the most exciting years in its DX history. Countries from where amateur activity was forbidden or non-existent in the past 10 to 20 years, have suddenly changed their outlook on the world. Checking through my notes of the past 12 months, I can see at least two-dozen significant DX callsigns, out of which the activities from Afghanistan (YA), Ethiopia (ET), Bangladesh (S2), Myanmar (XY0) and Albania (ZA) stand out. There was also a Saint Felix (XQ0), Canton Island (T31), Saint Peter and Saint Paul Rocks (PY0S), Pagalu (Annabon) (3C0) Tromelin, Glorioso and a St Brand Island operation, just to name a few.

Where do we go next? This is the title of a book written by Martti OH2BH about his DX activities, which clearly poses the question. Once one reached the DXCC Honour Roll, what do you do next? Turn to the IOTA movement and collect island activity by the hundreds? Work DXCC via satellites? Work three-band DXCC using the WARC bands only?

I suspect the majority of us will continue to work DX the same way as before. Hopefully a little wiser, with a more tolerant outlook on life. Hopefully with increased skills in operating techniques, but being ever grateful to the pioneers of the past 150 years whose scientific and sometimes accidental discovery enabled us to enjoy this fantastic hobby of ours. May I wish you the compliments of the season and a happy, healthy and prosperous new year!

Bangladesh — S2

On 29 August the Bangladeshi T&T Board made the decision to introduce amateur radio service to that country (see *AR* May, June, Sept and Oct issues). Jim VK9NS, through his previous stay in that country, has contributed in a very positive way to the establishment of the amateur service. He worked on the draft rules and regulations and the T&T Board used that information to establish the amateur radio proposal, which was then presented to the Bangladeshi Government for final approval. It is hoped that by December the amateur radio service will be fully integrated into the legislative system, and by January 1992 is is expected that Bangladeshi nationals and foreigners will be able to receive licences and operate freely.

To prove the point that the "light is around the corner" the frequency division of the T&T Board has issued the first licences to two local nationals. Saif, President of the Bangladeshi Amateur Radio League (BARL), was allocated S21A, and Nazim, the Secretary of BARL, was allocated the S21B callsign. Encouraged by these decisions, Jim VK9NS and Kirsti VK9NL made a formal application for issue of licences and for approval to operate from that country. Mid-October Jim and Kirsti received an official invitation to visit and to operate from Bangladesh, and they also received the first callsigns issued to foreign operators. S21ZA was issued to Jim, and S21ZB was issued to Kirsti. The covering letter bringing the good news mentioned that these callsigns were issued in recognition of the considerable contribution made by Jim to the furthering of amateur radio in Bangladesh.

The Smiths were to leave Norfolk Island on Wednesday, 23 October. However, this departure time had to be moved to the 22nd, due to a strike in Sydney which affected the transport system. They arrived in Dhaka on Thursday, 24, Friday being a Muslim holiday and the weekend busy with the CQ WW SSB Contest. Nobody expected them to be operative before 28 October, despite the fact that a CW operation would have been possible more or less immediately after arrival and setting up the station. Kirsti S21ZB is a keen CW operator, and her stay was limited, as she had to return to Australia on 4 November due to a prior and unavoidable engagement.

The DX world was waiting. By 31 October rumours were circulating on various DX nets about an imminent activity by Jim from S2. Some DXers even quoted the frequency of 14147 on which Jim will appear. At around 0500 UTC on the same day, Ken VK5QW has advised the "222" net in a language circumspect with all the refinement of diplomacy, that he received a fax at 0300 UTC from Jim, which indicated there has been a departmental "hiccup" in the scheme of things in Bangladesh. Ken quoted Jim as saying: "Do not give up hope and have faith. The relations with the T&T Board are soundly based, and the temporary difficulties will be ironed out soon."

The unexpected time delay made Kirsti's activity impossible, and she returned to Australia on 4 November as originally planned. Jim intended to stay on in Bangladesh until 20 November as originally planned, unless changed circumstances dictate his movements otherwise. At the time of writing this, there is still no news of him being on air. The mystery of the East has engulfed Amateur Radio again.

Albania — ZA

If you were interested in working Albania, I am sure by now you have succeeded in so doing. The other day I even heard a ZA calling "CQ" and there were no takers. The number of ZA stations heard on the band has multiplied since 17 September.

ZA1A was active in SSB, CW, RTTY and AMTOR mode, and closed the station on 7 October after it made over 70,000 contacts. Incidentally, the ZA1A activity was accepted by the ARRL for DXCC credit. ZA1QA and ZA1HA continued to be active, and were joined by the French operators signing ZA1ZXV (F6EXV), ZA1ZMX (F6FMX) and ZA1ZXV (F2VX). It appears that callsigns issued to foreigners by the Albanian PTT Board will start with the letter Z in the suffix. The French team left Albania on 11 October after 13,000 QSOs. According to some news reports, the ZA1A group trained 12 Albanian operators and they will soon be heard with the callsigns beginning with ZA1TAA through to ZA1TAL.

Only three weeks after the ending of the ZA1A operation, the first QSL cards have already been mailed. According to those who have already received them, the cards are of beautiful design, with the traditional two-headed Albanian eagle with a golden crown on its head. There were also some new stations on the air from Albania. ZA1ZSW Scotty W7SW was active for a short period. ZA1DX

Antoine 3D2AG in his own shack at home in Suva, Fiji.

The Rotuma "shack" used by many visiting amateurs, including Antoine 3D2AG.

was operated by Zoli, who arrived back in Albania on 12 October. QSL for HA1DX to: Globex Foundation, PO Box 200/66 1751 Budapest, Hungary. During the CQ WW DX Phone contest, ZA0RS was operated by HA0DU.

The ZA1HA activity was started by Zoli HA5PP and Imre HA5HO at the end of September. This station is connected with the efforts of the Hungarian Amateur Radio Society (MRASz) to give Hungarian radio amateurs the opportunity to work from Albania. (See *AR* March 1991 issue). HA5HO and HA5PP have gone back to Hungary, but Zoli HA5PP returned again as ZA1DX on 12 October.

On 2 October, a new team arrived from Hungary to operate ZA1HA. They were HA4XW, HA4XG, HA5OV, HA5FA and HA6NF. This new group will try to find a permanent location for the station, and hopes to train a number of Albanian operators, who will then continue to be active using the equipment and antennas left behind by the Hungarians. The logbook of the QSOs will be computerised, and QSLing for contacts made as from 2 October will be through HA6KNB, with the appropriate SAE and return postage. The station hopes to be active on VHF and UHF bands, including satellites. QSL to HA6KNB: Radio Club Salgotarjan, Box 115, H-3101, Salgotarjan, Hungary.

The "CQ" Worldwide DX Phone and CW Contest

These two contests took place on the weekends of 26/27 October and 23/24 November. The contest is always a good source of rare DX, usually with distinctive, and sometimes strange, prefixes, which cause a lot of headaches for many of us because of the missing QSL information. Here are a few of the exotic stations and in brackets the QSL route: * HG73DX (HA5ML) • XE1L (WA3HUP) • PJ9W (OH6XY) • V9AD (W3HNK) • ZM2K (ZL2IR) • P40W (N2MM), WE5I/KH9 and AD1S/KH9 (Oklahoma DX Association, Box 88, Wellston, OK74881 USA • H61T (Nicaragua) (SM0KCR) • HL9AA (N2JNZ) • PJ7A (Sint Maarten) (callbook address) • PI4COM (PA3CAL) • HS0E (John K9EL) • ZK1XC (K6PBT) • J80D (W8KKF) • 9M6NA (JE1JKL) • 6I2A (Mexico X32KB) • V31DX (KF6TC) • 5V7JG (F6AJA) • 5B4BCC (DL4MDO) • C6AFT (AA6NT) • CT3M (CT3BX callbook address) • ZW5B, ZX9A, ZY5EG are all in Brazil (PY5EG) • KH0AM (JE1CKA) • ZB2X (OH2KI) • V63DX (JH7HMZ) • V47NS (W9NSZ) • ZD8Z (W6CF) • KH2S (JH4RHF) • P40T (K4PI) • V47KP (K2DOX) • 9M6RO (JH1ROJ) • 9H4H (K6NA) • J43A (SV3AQR) • P40V (AI6V) • PJ1B (K2SB) • TT0A (F6FNU) • TU2QW (F2CW) • T30A (K7EHI) • TL8IM (AC3D) • D73DX (HL1IE).

Special Events Stations

During the year 1992, you will hear the special event station VI2RC quite often. The operator will be John VK2DEJ, and his direct QSL address is: John Saunders, 8 Toni Cres, Ryde NSW 2112 Australia. The occasion for the special event station is that the Ryde Municipality, which is an inner suburb of the metropolis of Sydney, celebrates its bicentenary and, during the year 1992, will be elevated to city status.

For those who are involved in the IOTA program (Islands On The Air), the station VK4VD will be activated from Stradbroke Island, Qld (IOTA OC-137), near Brisbane, from 2-5 January 1992. Activity will be in the SSB and CW modes, on 28-21-18 and 14MHz. QSL direct only, with return postage to VK4CRR: Bill Horner, 26 Iron St, Gympie, Qld, 4570 Australia.

Kermadec Island — ZL8

The not-so-good news is that George ZL8GBS (see *AR* November) might not be able to operate at all from the island. George is an employee of the New Zealand Conservation Department, and, hearing that George has received an amateur licence, the Department has decided not to give permission to George to operate his amateur equipment from the island. The official explanation is that amateur radio caused some problems in the past on Raul Island, including "illegal landings..."

The ray of hope is now with Ron ZL1AMO who, according to unconfirmed rumours, intends to activate Kermadec Islands some time in 1992.

Future DX Activity

* The Clipperton DX Club has announced plans for a major Clipperton Island Expedition scheduled for March 1992. Proposed callsign is FO0CI.
* Andy G4ZVJ is active in the Pacific region. He intends to go home on 16 December, but until then will be active from A35VJ, 5W1VJ KH8/G4ZVJ, and he also hopes to sign as T20VJ.
* Jacky F2CW will operate from Afghanistan as YA2CW starting from 19 October.
* Rod 5Z4BH who was active during October from the Republic of Comoros as D68RH will return to Arizona in December. However, in January he will already be in Karachi, Pakistan, and hopes to get permission to operate from there.
* The well-known Franz Josef land station 4K2OIL has closed down after 30,000 QSOs. The new operator is 4K2MAL, and QSL goes to UA4RC.
* Christine (ex-3DA0BX) and Paul (ex-3DA0BW) are now operating from Malawi as 7Q7B and 7Q7BW. QSL to N5MHZ.
* JX9EHA will stay on Jan Mayen Island until April next year. LA9EHA is the operator, and QSL goes to LA5NM.
* According to the news received from Paul AA2AV, the visit of the six-man US team to Vietnam has been delayed to January or February next year.
* 9L1US Dave will be back in the US soon.

In March 1992 he will go to Botswana A2 for a stay of three years.

Rotuma Island 3D2

The Rotuma Island group, located at 12'30" south and 177'00" east in the Pacific Ocean, is one large volcanic island, size about 10 x 3km, with a population of approximately 3000, and is surrounded by eight small islets. The group was discovered in 1791 by British sailors while searching for the "Bounty" mutineers, and it was named as Grenville Island. By 1850, the influence of various Christian missions caused a number of religious wars among the native Polynesian population. This unstable situation ended in 1881, when the island was annexed into the-then eight-year-old British Crown colony of Fiji. The religious influence is still very strong today, and the Sunday Sabbath is strictly observed. The name Rotuma in the local language means "Belief in the Church".

Rotuma gained its popularity as a new DXCC country in 1988, when a group of amateurs (K3NA, W6SZN, KN3T(YL) and VK8XX) activated the island for two weeks with the callsign 3D2XX, making 34,688 QSOs with 173 DXCC countries.

Soon after, 3D2RJ (ZL1BQD) and 3D2AH (OZ1XJ) appeared in August 1989 and had 10,500 QSO, of which about 60 percent were on CW. "Bing" VK2BCH is more or less a constant visitor to the island. Nineteen-eighty-nine, 1990 and 1991 were the years of his stay on the island, of about one month duration on each occasion.

The latest expeditioner was Antoine 3D2AG, who stayed on the island for one month in July 1991.

I received a long interesting letter from Antoine detailing his experiences on the island.

Antoine used his own callsign on Rotuma, being portable, but had a special QSL card printed for the occasion to acknowledge about 4000 QSOs he made on 10 to 40 metres, on which about 75 percent was on CW.

Antoine is a 24-year-old marine biology student at the university, who used his university holiday to be active from the island. Visits by tourists to the island are not encouraged, and one has to have the permission and the invitation of the local elders before attempting to land there.

Let me share Antoine's experiences with you by quoting from his letter:

> ... "There are no hotels or such facilities on the island, and one has to rely on the hospitality of the local population. Money has little meaning on the island, hence one has to be considerate of the local customs. Also, there is no regular power supply, and the only links with the outside world are the twice-monthly boat visits from Fiji, and a weekly flight from Nausori, Fiji. My own plans for a DXpedition to Rotuma materialised in late June 1991. Knowing a family on the island, accommodation was not a problem. Hence I packed up all my ham gear, including two solar panels for charging a 12v car battery. "Bing" VK2BCH kindly offered the use of his generator and battery on the island, as well as his beam. Hence, with eagerness I boarded the MV "Wairua" for the two-day trip to the paradise of Rotuma Island.
>
> While the boat journey was by no means easy (especially on one's stomach) the scenery was beautiful, and the cheerfulness of my fellow passengers was extraordinary. On the Monday morning about noon we reached the island, and the wharf at Oinafa was bustling with people and vehicles (about six of them, the entire contingent of the island). After a day with my friendly hosts and a look at the marvellous white beaches at Oinafa, we set out by truck to Fapufa, the village where the beam and radio shack of 3D2XX fame is located. Fapufa is situated on the south-west corner of the island, and consists of three houses. The area is noted for its beautiful scenic beach and also an underground freshwater cave which is a favourite swimming spot.
>
> The "shack" actually consisted of a palm-front hut, with provisions for an operating table and bed. The beam was about five metres from the hut and had to be turned by the "strong-arm" method. For ground connections I opted to throw an old bicycle frame into the adjacent lagoon. The 40/80m antenna was a dipole, swung between two coconut trees at about 66 feet. The set-up worked very well, especially on 40 metres. There is no mains supply of power, and I opted to connected the two 12v panels to a car battery for daylight operation.
>
> At night, a 240v generator was used.
>
> My operations were mostly nocturnal, owing to the poor propagation during the day. Ten metres was dead most of the time, although quite a few JAs were worked in the mornings on 14 and 28MHz. Fifteen metres was open to the States from 0000 to 0400 UTC, and I occasionally checked into the ANZA net and the "14222" net. The real action, though, did not begin until about 1030 UTC, when the 20m band was opening to the States. Large pile-ups were worked well into the early hours of the morning, including QSYs to 40 and 30 metres. The daily number of QSOs averaged about 300, mostly on CW. At times the generator would run out of fuel in the middle of the pile-up, and one had to switch to battery power for a solution. One night was really bad. I had to write my log, using a torch in one hand and the mike in the other. Owing to the difficulty of turning the beam, not too many Europeans were worked, but I did get through to most parts of the world. As far as living conditions went, the shack sported a wooden bed plus mosquito net, which was very useful. At night, all sorts of bugs and rats prowled the hut; sometimes it was quite scary. Overall, the expedition was a success, and I hope many operators were happy to get a "new one" as a result ..."

writes Antoine, concluding his letter. Antoine indicated that he will return to Rotuma in December 1991, but his time will be devoted to his university research studies, which will leave no time for amateur activity.

Interesting QSOs and QSL Information

Note: Callsign, name, frequency, mode, UTC, month.

HP1CDW-Henry-21210-SSB-0418-Sept. QSL to PO Box 10745, Panama 4, Panama.

D44BC-Julio-21205-SSB-0457-Sept. QSL to Julio S Vera Cruz, Box 36, Mindelo, Cape Verde Islands.

9Y4KB-Brian-21205-SSB-0517-Sept. QSL to Brian Eligon, 34 Lucas Hill, Malick, Trinidad.

XU0JA-21040-CW-0010-Oct. QSL to JA1NUT, Sin Onishawa 200-9, Naka, Mohka, Tochigi, Japan.

SV0HNU-14001-CW-0700-Oct. QSL to F6FNU (direct only) Antoine Baldeck, Box 14, F-91291, Arpajon, Cedex, France.

A35XJ-Les-21022-CW-0025-Sept. QSL to KE6XJ, Box 44, Bonita, CA9002, USA.

FY5FP-Chris-14016-CW-0440-Oct. QSL to ON4ZD, Leon Donner, Rue Gaston Dubois 6, B-1428, Braine I Alleud, BT Belgium.

XV3UU-Harry-14195-SSB-1239-Sept. QSL to RA3AUU, Harry Booklan, Box 18, 109457 Moscow, Russia.

8R1RBF-Richard-14222-SSB-0703-Sept. QSL to Richard B Fields, Box 10932, Georgetown, Guyana.

VP9WS-Rose(YL)-14191-SSB-1125t. QSL to Sept. QSL to WB2YQH.

JW0GB-Laila(HL)-14226-SSB-1207-Sept. QSL to Laila McClain, Box 445, N-9170, Longyearbyen, Norway.

ZA1ZXV-Paul-14222-SSB-0510-Oct. QSL to F6EXV, Paul Granger, 4 Impasse Du Doyen Henri, Visio, F-33400 Talence, France.

CN8FR-Idres-14222-SSB-0707-Oct. QSL to Box 990, CP-40400, Fes, Morocco.

XF3RGS-Salvatore-21205-0601-Oct. QSL to Box 1, Cancun Q Roo, 77505, Mexico.

EA9QD-Toni-14057-CW-0715-Oct. QSL via the Bureau.

5Z4FM-Jim-14013-CW-1410-oct. QSL to Box 39773, Nairobi, Kenya.

D68RH-Rod-21205-SSB-0535-Oct. QSL to KE3A William G Kessinger, 2521 Sharon Circ, Sunderland, MD 20689 USA.

V31UN-Peter-14226-Oct. QSL to KA6V Joan E Branson, 93787 Dorselyn, Junction City, OR 97448 USA.

YI1RJ-Rashed-14253-SSB-0622-Oct. QSL to Box 7147, Baghdad, Iraq.

W6RO-Jim-on the "Queen Mary", 14230-SSB-0537-Sept. QSL to WB6FNI James W Young, 1057 Apple St, PO Box 576, Wrightwood, CA 92397 USA.

RTTY News

There was a lot of DX activity on the bands during October, including the activity created by the CQWW RTTY Contest. Here are some contacts as supplied by Syd VK2SG.

* KP2N-14087-0535Z. QSL to WA4WIP.
* C9RKL-14082-1317Z. QSL to Kurt Nygren, Box 2524, Maputo, Mozambique.
* 6W6JX-28085-1005Z. QSL to Box 10, Kaolak, Senegal, Africa.
* VK4KW-14082-2329Z. QSL to WB2LCH.
* RA2FB-14085-0907Z. QSL to Box 261, Kaliningrad, Soviet SK, 23877 USSR.
* ZK1AP-14087-0608Z. QSL to Box 494, Raratonga, Cook Islands.

* PJ8UQ-14081-0328Z. QSL to W3HNK.
* SV0DV/9-14085-0356Z. QSL to WD4TDB.

CT3M-14085-1556Z. QSL to DJ6QT.

* HV3SJ-21091-1602Z. QSL to I0AOF.
* OD5SK-14085-1604Z. QSL to KB5RA.

From Here and There and Everywhere

* "Murphy" never sleeps and he reappears from time to time. The Spratly Island operation of Romeo (UB5JRR or 3W3RR) was under the callsign of 1S0RR and not under 1S1RR as indicated in the November issue of *AR*.
* During the weekend of 19-20 October, if you listened around the frequencies of 3590, 7090, 14190, 21190 and 28590kHz, you would have heard quite a number of young voices chatting about themselves, about hobbies, groups, Rovers, Guides, leaders. Yes, JOTA (Jamboree on the Air) was active again. From reports so far received, it was a great success. Last year 544,527 people world-wide participated in JOTA. Special thanks are due to the many amateur operators who willing offered their stations and their time for this very worthwhile youth project.
* The KP2A/KP5 Desecheo Island cards started to arrive in VK in the last days of October.
* News at hand indicates that ZS6AEN, who was scheduled to be on Gough Island ZD9, will not be going there.
* Jackie 3B8CF/3B7 returned to Mauritius after having made 17,000 QSOs on St Brandon Island.
* FF0XX is located in Marseilles, France, and it is a special call for the Clipperton DX Club.
* Jack T30JH was very busy professionally in the past months, which is the reason he was absent from the bands. Jack advised me that he was flying to Ponape on the November and hoped to be active as V6EJH. Later he proceeds to Kosrae Island, then back to Nauru and Kiribati.
* Bing VK2BCH, after a lengthy Rotuma activity, moved to Tuvalu on 8 October and was active as T20XV. He closed down that operation on 20 October and returned to Forster, NSW.
* 5J500/D1 is a Colombian special call for the commemoration of the 500th year of the discovery of the Americas.
* Heard Jim W3AJR saying on the band that he bought his first callbook in 1940. It was of only one volume and the price was $1. According to him, it was only one finger-width thick, and contained all the US and the rest of the world's callsigns. The present callbook is of two volumes, each 60mm thick, and the price of both books is 60 times the 1940 price.
* Austin VK5WO sent me the latest list of the VK stations on the ARRL DXCC Honour Roll at 30 March 1991. The first number represents the present country total. The second number includes deleted countries in addition to the present ones. Open/Mixed: VK6HD 321/342, VK5WO 320/352, VK3YL 319/357, VK4QM 313/364. Phone: VK6RU 322/372, VK5WO 320/349, VK6HD 320/340, VK4LC 319/354, VK6LK 319/336, VK9NS 316/317, VK5MS 315/362. There are no VK stations on the CW Honour Roll. When this list was compiled there were only 322 countries on the list, but, as from 1 September, with the addition of Penguin Islands, the total is 323.
* The DX Advisory Committee of the ARRL voted unanimously against recommending a new country status for Jarvis Island. The AH3C/KH5J QSL cards will be accepted for Jarvis Island. The AH3C/KH5J QSL cards will be accepted for DXCC credit for Palmyra Island KH5.
* The Armenian operators will use the 4J3, 4J4, 4J7 and 4J8 prefixes from 21 September until 31 December this year.

QSLs Received

Note: W=week; M-month; Y-year; FM-from; MGR-manager and his call; OP-operator and/or his call.

Direct cards received: TL8IM (3W FM OP) — VP2MLD (5W FM MGR KC4DWI) — 7Q7JL (5W FM OP) — AA4NP/AH9 (11M FM OP On return to US) — KC6GV (5M FM MGR LA6ZH) — HC8GR (1M FM OP) — VU2CVP (3M FM OP) — 3D2AG (Rotuma 2M FM OP) — FS/KB4VHW (3M FM OP) — 3C1MB (3M FM MGR EA7KF).

Bureau cards received: IL3/IK3HXB (1Y 11M FM OP) — OA4CAN (9M FM OP) — GJ2LU (1Y FM OP) — DK1CE/H44 (1Y 3M FM MGR FJ9ZB) — H44MS (1Y 3M FM OP) — PJ2WG (10M FM OP) — T30NAD (1Y 3M FM MGR JO1CRA) — YJ0AMH (10M FM MGR KF7PG) — ZC4BOB (10MFM OP) — ZL7TZ (12M FM OP).

Thank You ...

Once again, many thanks to all my helpers who supplied me with information by letter, photo and phone call. Your help is very much appreciated. Special thank you to: VK2CX — VK2DEJ — VK2ENU — VK2KFU — VK2QL — VK2SG — VK3DD — VK4CRR — VK4DA — VK4OH — VK4UA — VK5QW — VK5WO — VK9NS — HA6NF — 3D2AG, and the following publications: *QRZ DX, The DX Bulletin and the DX News Sheet.*

Late News

It was reported on the bands, and it even appeared in various DX publications, that VK0WW is active on 14010 and he asks the QSL cards to be sent via the Bureau. Others on the bands reported that VK0AI is active from Heard Island. This news is a surprise for the VK DX community, as we have no information about these stations. Neil VK6NE, who is the Federal QSL Manager for VK9 and VK0 advised me that, according to investigations which he carried out with the relevant authorities, VK0WW is not known on Macquarie Island, and no licence was issued to VK0AI. It appears the two station are "slims". Please ignore them and do not QSL.

Late Late News

Bangladesh message just received from Ken VK5QW on 11 November. Jim VK9NS advises that the licensing situation in Bangladesh has now been established and that a recommendation will go before the government. It is expected the licensing system will be authorised within a few days, which will make amateur radio legal in Bangladesh.

Jim expected to have permission on 12 November to operate under the callsign of S21U, which is the official callsign of the Bangladeshi P&T authority.

Jim intends to leave Bangladesh on 20 November, but there is a possibility he might get a visa extension for one week.

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Have you advised the WIA Executive Office of your new callsign? Use the form on the reverse of the Amateur Radio address flysheet.

REPEATER LINK

WILL MCGHIE VK6UU @ VK6BBS – 21 WATERLOO CRS, LESMURDIE 6076

Audio Mixer

Repeaters mix several sources of audio to produce the output that is heard on air. Far more than the casual observer may think.

As many as eight or more audio sources may have to be mixed.

1. Repeater's receiver audio
2. Morse code ident
3. Time-out tone audio
4. WIA News audio
5. Encoded CTCSS tone
6. Link input audio
7. Time-out reset tone
8. Special function status tones (flat battery etc).

Your repeater may have few of the audio sources listed, but there is always a need for an audio mixer in a repeater. The circuit shown has been used in several VK6 repeaters with excellent results. This circuit is used to drive a true FM varicap diode in the transmitter. A voltage swing of approximately +-2 volts is requires with low distortion.

Distortion better than -50dB (0.1%)

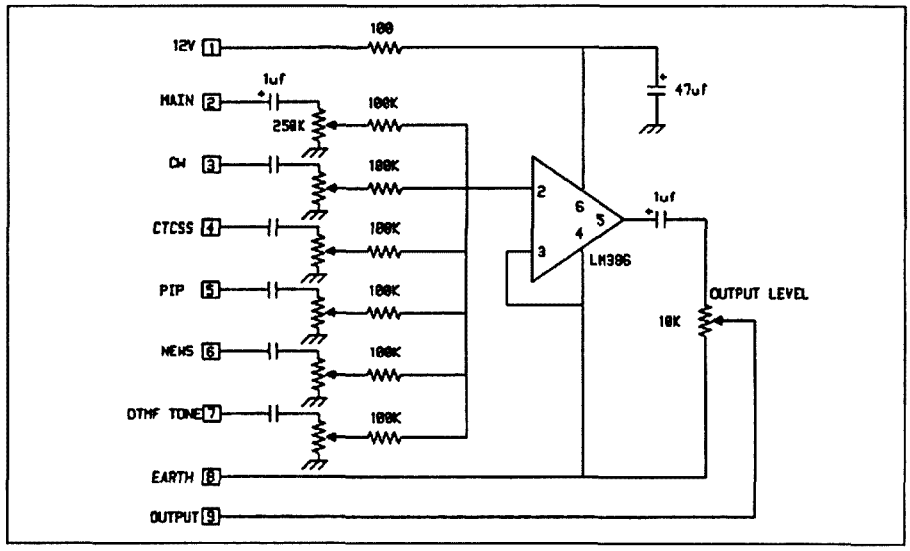
High output level, +-5 volt swing from 12 volt supply

Voltage gain set at 20

Low current drain, 5mA

Simple to construct

Any number of inputs can be added. The circuit shows six. The LM386 is a low power speaker amplifier and suits this application. The values of the input pots can be 100k to 500k. The 1µF input capacitors are required only if the incoming audio has a DC component. ar



SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH – 52 CONNAUGHT CRES, WEST LAUNCESTON 7250

Well, another momentous year has finally come to an end. Let us look back and retrospectively examine the past 12 months. First off, we had the Gulf War. The Americans started bombing Baghdad and other Iraqi cities on 17 January. For some weeks prior to this, we were able to hear, quite easily on shortwave, the build-up of American and other Allied military forces within Saudi Arabia and nearby Gulf states.

A furious propaganda war broke out on shortwave prior to the commencement of hostilities, and lasted well after they finally ceased. Several clandestine operations emerged from within Saudi Arabia and other mid-east locations, broadcasting to Iraq and occupied Kuwait. The Baghdad regime countered this with deliberate jamming of the broadcasts directed to Iraq. This was easy to spot, as the jamming had, and still has, a very distinctive sound, being quickly referred to as the bubble jammer. It appears on top of Arabic broadcasts, including those not normally targeted on Iraq. When the aerial bombardment commenced, all HF transmitter sites in Iraq and Kuwait were identified and destroyed. This removed the bubble jammer until recently when it began to cause problems once more.

Some listeners were very fortunate to hear Tactical Air Traffic on HF, especially around 11.1 to 11.25MHz. As well, the British Forces Broadcasting Service was heard here from BBC senders in Cyprus and the UK. They broadcast mainly cheerios from home to the troops. The Ground Offensive for the Liberation of Kuwait lasted only 100 hours, and again shortwave radio very rapidly provided news of events.

Radio Baghdad was silenced and has not yet reappeared with any significant signals. Neither have the Radio Kuwait senders, which were previously easily heard on HF worldwide. I guess there were more pressing problems in the rebuilding of the small Gulf nation after Iraqi plunder and excesses.

In April, Radio Canada International virtually closed its shortwave programming. Although still operational, it is at a much reduced level, with relays of the CBC domestic service in English and French. The only foreign-language services are in Russian, Ukrainian, Czech, Spanish, Chinese and Arabic. Popular English presenter, Ian McFarland, who hosted the SWL program, is now on Radio Japan's English service.

Other broadcasters to make severe programming cutbacks in their output, due to budgetary cutbacks, have been Radio Tirana in Albania, Radio Budapest in Hungary, the English Service of Kol Israel in Jerusalem, and the Asian and European sections of Radio Moscow have also been severely cut back. One major station that disappeared was "Radio Peace and Progress" from Moscow.

As well, the number of clandestine broadcasting stations has also markedly declined, especially in Africa. Ethiopia threw off its Marxist yoke and its support of rebel political groups in adjoining countries. They gave program time to these various groups over their senders. Also, the number of regional outlets on shortwave from within Central and South America appears to be slowly declining. There also seems to be less Indonesian outlets within the tropical bands, although the number of legal and illegal HF SSB networks across the HF spectrum, located in Indonesia, have increased, particularly within exclusive allocations such as aeronautical and amateur.

At the time I am compiling this column the civil war within the Balkans between Serbia and Croatia is at a stalemate. I realise European monitors have had numerous advantages over monitors elsewhere, because electronic activities on MW and FM have so far dominated. The Serbian-controlled Radio Yugoslavia has reportedly been observed but is, not surprisingly, very erratic in its output.

But the major development for the year must be the attempted coup in Moscow on 19-21 August. Listeners were startled by the reimposition of censored broadcasts and ideological programming for three days. But, as we now know, the coup failed dismally. Even Gorbachev was able to keep abreast of what was happening on the streets of Moscow. Although temporarily imprisoned in his Crimean dacha, he and his loyal aides hastily erected a shortwave receiver and antenna, tuning to the BBC Russian Service for the news. The Communist Party virtually disappeared overnight, in the public's eyes being discredited in influence and prestige.

The external services of Radio Moscow also emerged from the attempted coup with their credibility somewhat tarnished.

Since the momentous changes within the former USSR, we have seen major changes in the broadcasting organisations. Independent stations and networks have rapidly filled the void across the various sovereign republics. The Baltic countries of Estonia, Latvia and Lithuania have won their independence from Moscow. They had to rapidly develop their own shortwave senders, as the relays that were formerly provided by senders located elsewhere in the Soviet Union were no longer available. Signals are, I believe, best in the Nordic countries at this stage.

I would predict that events in the former

Soviet Union possibly won't impact as in previous times. Already several foreign broadcasters have commenced airing programs over Soviet domestic networks, obviating the need for HF broadcasting.

I believe the World Radio Administrative Conference (WARC '92) in Barcelona will become a significant milestone in the history of HF telecommunications. Clearly, with the virtual disappearance of jamming as a result of Cold War rivalries, and with financial cutbacks to international broadcasting and programming, perhaps there could be less demand in the developed world for HF broadcasting allocations. I believe a demand, particularly in Asia and Africa, for shortwave broadcasting will still exist.

Propagation conditions have been very poor of late. Just lately I have noted shortwave fadeouts often disrupt communications. This is the case on the decline of the sunspot cycle.

Well, that is all for December and for 1991. Don't forget, if you wish to send messages via packet BBS, the route now is as follows: VK7RH @ VK7BBS Launceston TAS AUS OC.

ar

POUNDING BRASS

GILBERT GRIFFITH VK3CQ – 7 CHURCH ST BRIGHT 3741

The information on learning the code featured this month was kindly sent to me by Jim Gray VK2DPU and is from the Marconi School of Wireless way back when its address was in 47 York St, Sydney, and the phone number was 2 0233! There is no date on the (copied) publication so I wonder if anyone knows when the booklet was produced.

These days there are many ways of speeding up the learning process, from tape cassettes, which would have been undreamed of then (as would have tape recorders), to the latest computer programs which are "intelligent" enough to monitor a student's progress and alter the lessons accordingly.

My own learning was done from cassette using the well known EISH5 formula, and I can now see how this process was initiated, because the Marconi School used the EISH5 formula for its sending practice in this publication, the learning of the alphabet was just that, with no preference to groups of letters.

What follows are only excerpts which I hope you will find interesting and maybe helpful as well; there is not enough space to print the lot in this column.

Introduction

Before commencing to learn telegraphy, the student should carefully read and understand the instructions contained herein. He should always practise strictly in according with them.

A number of methods of training are or have been in general use but, after careful investigation of all these methods, and in the light of many years of practical experience in this subject, we have adopted the methods set out as the most efficient.

Learning telegraphy requires many hours of practice, which are only lengthened by inaccurate procedure or careless or slovenly work. Five minutes' neglect of simple rules may undo an hour's practice. Ten minutes may undo the benefit if many hours of conscientious work.

... Handwriting is very important and, as the student must spend many hours in practice, concentration on this point will not only improve his handwriting but, for reasons explains later, will greatly assist in learning the code.

The modern method of learning morse relies on the principle of training the subconscious mind to recognise the symbol, not as a series of dots and dashes, but as a letter or numeral, and it is obvious that at high speeds the action of reception and writing are done without conscious effort. We might compare this with a person reading a book. He is so trained that while he subconsciously recognises a letter, he consciously reads the word as one complete unit, although the subconscious mind actually checks every letter. By concentrating on handwriting, as previously indicated, the student does not think of the morse, therefore the conscious and subconscious minds are in step and progress will be much faster ...

If the student has not previously undertaken morse training, the following procedure should be followed until he is able to receive morse signals at about five words per minute.

How to Learn Morse Code

Rule lines on the paper, dividing the sheet into five columns. Look up the morse alphabet on page B-3 and it will be noted the symbol for A is "d'dah" (pronounced "dit dah"). The student should sing "dit dah" to himself (preferably aloud) and then write A in the left-hand corner of the first square. Do not commence to block until the symbol has been completed. Repeat this 25 times, writing five letters in each square, and keeping the letters to the left-hand side so that if the vertical lines were removed there would be at least a double space between the last letter in one group and the first letter in the net. Do each letter in the same way, including the numerals. Practise this until able to sing the alphabet and numerals without reference to the code. Carry on singing each letter five times, making a complete group of each. If any hesitation is experienced, the student should revert to the earlier procedure of singing each letter 25 times for several complete alphabets. Do not write the letter or numeral until the symbol has been completed. For instance, if the student writes the D before the last "dit" is sent, this is equivalent to commencing to write a word before pronunciation is complete, and leads to the common fault in telegraphy called "journalising", which is due to anticipating a letter or word. In the above example, the sender may be sending the letter B, the student has commenced to write D when the extra dit is received, and he has to change the letter to B. This causes confusion and wastes a lot of practice ...

The student may by diligent practice sing to the speed of up to 10wpm without having heard a signal. After attaining this speed, or before, the student should have access to morse receiving by means of a buzzer, and all future practice should follow along the lines of signal reception ...

In undertaking telegraphy instruction the following order should be followed:

1. The student should make himself thoroughly conversant with the method of blocking code letters and numerals (capitals). It is not necessary to practise blocking separately but to read the section dealing with blocking and understanding the reasons underlying the system.
2. Learn Morse Code in the manner proscribed, ie "singing" until able to recognise all morse symbols without difficulty. Practise reception of the code until able to receive about 8wpm.
3. Concurrently with singing practice, but after the student can recognise all symbols, commence sending practice in accordance with the directions contained herein.
4. When able to receive code at about 8wpm carefully read and understand the instructions for writing Plain Language, and proceed to practise receiving plain language.
5. Divide receiving practice into periods of Plain Language and Code.
6. Become conversant with test conditions. The method of conducting tests is set out herein. Always remember that accuracy is paramount and, whilst a number of errors may be permitted in a test, in commercial telegraphy errors are not permitted.

Next month I hope to continue with more from this booklet in the form of learning to send Morse Code. ar

Don't buy stolen equipment – check the serial number against the WIA stolen equipment register first

INTRUDER WATCH

GORDON LOVEDAY VK4KAL – AVIEMORE, RUBYVALE 4702

WIA IARU MS Summary September 1991

Date	Time U/TC	Frequency in kHz "M" or "E"	Callsign If Heard	Mode Air	Time on	Logs X	Details of Traffic If Known any any Other Information
230991	1303	7003	V	A1A			Beacon
2009	1100	7007/8		J3E		5	Asian traffic 2-way
2409	0001	7009		F1B		2	No shift stated
2009	1125	7012		J3E		7	B/caster Asian language
2908	0915	7015/7016		F1B/B9W		2	Would like shift please
300991	1020+	10107		A3E?			B/cast in Spanish/test transm
2209	0951	14007	UMS	F1B +A1A			1st logging on this freq
230891	0800	14023.5		F1B	24hrs	2	250Hz shift
1509	0850+	14046	R Aust	A3E			Spurious mixing?
mni	1105	14044/7		J3E/L	24hr	28	Asian RTF
mni	1039+	14045		N0N		6	Carrier for telephone channels
mni	1020	14058/63		A3C	24hr	28	Helschrsiber ... China?
mni	mni	14075	VRQ	A1A		30	Vietnam. 5ltr code tfc
130991	1410	14117	J2K	A1A			Ltrs & figs
1209	1115	14119		F1B		3	1000Hz + A1A ltrs & figs
mni	0620+	14120		F1B		6	500Hz shift
230891	0812+	14170	MNR	F1B	24ht	10	Moscow Nav radio 250Hz RTTY
1009+	1020+	14183/4		F1B	24hr	3	1000Hz RTTY
1209+	mni	14203/4		F1B	24hr	8	Rmks "OJK5 QCM K"
mni	mni	14212		F1B	15hrs	26	1000Hz
1209	1210	14215	CAZ	A1A		13	also P7A
1609	mni	14217/8	UMS	F1B	18hrs	21	Mos Nav radio USSR
0709	1246	18074/5		A3E		6	B/c stn prog in Chinese +18120
0209+	mni	21031	UMS	A1A		16	
0209+	0830+	21032.5	MNR	mxd		21	Not UMS tfc to UUMS
2608	mni	21115	P7A	A1A		26	Was CQ5 mni freqs
0609	0450+	21135	VVH	F1B		2	200Hz ID A1A 0558 z
1209+	1000+	21448	R Mosc	A3E		15	Severe distortion & Splatter
Can be resolved in F3, located at Yerevan, Armenia							
2209	2315	28640	BBC	A3E??		2	BBC World Service News In Indonesian, English language lesson at 2330z.2345z transmx change slg degraded

Reports from VKs 2GDF, 4BG, 4AKX, 4BHJ, 4BXC, 4BTW, 4CAS, 5LG, 5BJF, 6RO, 6XW/M, 6BWI.

Notes this month come from Col VK4AKX, who is a dedicated follower of the intruders emanating from USSR (Russia). thanks Col.

Of most importance, as they cause much strife to our operating, are 14.058-14.063MHz involving QSY hopefully caused by amateur QRM (keep it up). Suspected of being in China: 14.211.5MHz-14.215MHz, two channels of F1B (not F7B) each channel is independent of the other; normal frequency change is in September each year, possibly due to poor conditions. 14.217.5MHz, this is a true UMS station, traffic is from UMS; its procedure in CW mode is as in combined operations in WWII. 21.031.5, Moscow Naval Radio with traffic to UUMS in CW, F1B various shifts (RTTY), but 250Hz most used. Transmissions have a lot of RYs. 21.325.5/21.328MHz; "nest" of three R7Bs, Nil ID R7B used extensively by USSR naval shore stations. Weather (WX) fax stations are on the increase, conditions again I suspect; drum speed around 120rpm, heard on 21.344.5/21.347.5MHz, no ID. Note .5 in frequency, point to navigational transmissions, most are on air about 18 hours, 60 percent of that time with traffic. I hope this will enlighten some of our observers that it's worthwhile keeping a copy of logged stations, and, referring each time, a dossier can be built up. It will come in very handy for DoTC. The Radio Society of Sri Lanka has joined "The System". 73, VK4KAL

ar.

KNUTSHELL KNOWLEDGE

GRAHAM THORNTON VK3IY

A brief overview of what other magazines have to say. The information given below has been supplied to the WIA free of charge by Thornton Publishing. Your divisional library may have copies of the references quoted.

Amplifiers

All-Purpose Wideband Amplifier.

Andrew Pierson, *EA* vol 53 No 11 Nov 1991 pp 122 - 123, 136. il cct. A design is given for a wide band amplifier within 3dB from 5Hz to 32MHz. The output swing is 1.8V p-p into 75 . Input impedance is 1M .

Power Amplifiers.

Peter Phillips, *EA* vol 53 No 11 Nov 1991 pp 56 - 61, 103. il ccts, cmp, diag, pcb and photos. A general dissertation on the design of audio power amplifiers is given. A specific design is presented for a class AB amplifier suitable for an 8 speaker, requiring 190 mV p-p for full output.

Antennas

Magnetic

The Square Pancake Antenna. Ken M Doolittle W2SMR, *73* issue #372 Sept 1991 pp 18, 20. il diags and photos. A seven-turn small loop is described which is suitable for indoor use. It covers 80 to 20m. Taps on the loop provide matching for different bands and for extremes of the same band.

Marconi

Dual-Band Vertical. David F Curry WD4PLI, *73* issue #372 Sept 1991 pp 38, 40 - 42, 44. il ccts, diags and photo. An antenna with capacity top hat is designed for both 160 and 1750m bands. The antenna is insulated from ground by mounting on a bottle. A variometer design is included.

Mechanical Details

A Limited-Space Dipole Support. Al Dion W1DWX/4, *QST* vol LXXV No 9 Sept 1991 pp 22 - 23. PVC pipe and fittings are the basis for a cruciform structure, on the upper portion of which an inverted vee is mounted. The lower leg drops into a TV mast or PVC pipe. A specific design is given for 10m, but it can be scaled for other bands.

Rotating Tower Systems - Rohn 25 Rotation system. (Product Review) James W ('Rus') Healy NJ2L, *QST* vol LXXV No 9 Sept 1991 pp 35 - 37. il photos. An evaluation is given for this system, which rotates the entire tower instead of an individual beam.

Miscellaneous

A Clothesline Dipole. Ig J Galgan WA2VIA, *QST* vol LXXV No 9 Sept 1991 p 32. il diag. A 15m dipole is attached to a continuous external clothesline, solving a space problem for an apartment dweller.

The L-O-N-G Long Wire. Stan Gibilisco W1GV, 73 issue #372 Sept 1991 pp 46, 50 - 51. il diags. The erection of an 880 foot long wire antenna is described. The difficulties of erection and results obtained are discussed.

Multiband

Carolina Beam. (Product Review) Bill Clarke WA4BLC, *73* issue #372 Sept 1991 pp 34, 36. il diag and graphs. A controlled feeder radiation Windom type antenna is reviewed. Its frequency response extends from 10 to 80m. Polar azimuth and elevation plots are presented.

Economical Mobile HF Antenna. John Portune AA6NG, *73* issue #372 Sept 1991 pp 26, 28. il cct, diag and photos. A modification is described to convert a Radio Shack 21-908A Trunk Lid Mobile CB antenna to HF operation from 10 to 40m. A different loading/matching coil is required for each band.

Product Review

The Outbacker All-Band HF Mobile

Antenna. David Cassidy N1GPH, *73* issue #372 Sept 1991 pp 12, 14. il photos. A review is given of this multiband antenna after a 12 month road test.

VHF/UHF

More on the Glass-Mounted 2-Meter Mobile Antenna. Bill English N6TIW, *QST* (Technical Correspondence) vol LXXV No 9 Sept 1991 pp 41 - 42. il diag. A pair of wire radials is used when this antenna is installed on a vehicle which does not have a metal roof.

Yagi

Indoor 10 Meter Beam. Jacquelyn J McGlothlin N9CAP, *73* issue #372 Sept 1991 pp 24 - 25. il diags and graph. An indoor two element Yagi is described, which is constructed of coaxial cable. A coaxial balun is incorporated as part of the antenna. 5 - 6 dBd gain is claimed.

Audio

Simple Low Cost 'Karaoke' Adaptor. Rob Evans, *EA* vol 53 No 11 Nov 1991 pp 82 - 85. il cct, cmp, diag, pcb and photos. A differential amplifier eliminates lead singer's voice from stereo recording. A microphone input is mixed with the residual music, to allow voice substitution.

Sound Effects Generator. Ben Buxton, EA vol 53 No 10 Oct 1991 p 57. il cct. Two 555 timers and a decade counter are combined to produce a ten-note musical sequence.

Computers

Computer Interface. Greg Smith, *EA* vol 53 No 11 Nov 1991 p 72. il cct. An I/O data device which uses the computer parallel port to communicate.

Electronic Devices

Automotive

Budget Car Alarm Mk2. Rob Evans, *EA* vol 53 No 10 Oct 1991 pp 58 - 61. il ccts, cmp and photos. An improved version of an earlier design is described. Both exit and trigger delays are incorporated. The device senses any change in battery voltage caused when loads as small as the interior dome lamp are activated. A detailed description of the 555 timer is also given. The alarm is available in kit form from Dick Smith Electronics cat K-4310 price Aust$32.95.

Miscellaneous

A Simple Touch Light. Peter Murtagh, *EA* vol 53 No 11 Nov 1991 pp 93 - 95. il cct, cmp, pcb and photos. A touch sensitive toggle switch operates three LEDs. A discrete transistor flip flop is used.

Fluoro Light Wand. Peter Phillips, *EA* vol 53 No 11 Nov 1991 pp 90 - 92. il ccts, diag and photos. A hand held 18W fluorescent light is described, which is powered by six NiCads and an inverter. A kit is available from Oatley Electronics, PO Box 89, Oatley West, NSW 2223. Price Aust$ 27 posted.

Mini Night Viewer. Branco Justic and Peter Phillips, *EA* vol 53 No 10 Oct 1991 pp 78 - 82. il cct, cmp, diag and photos. A design is presented for an infra-red hand held image converter. This enables images to be viewed in very low light levels, such as starlight. A kit is available from Oatley Electronics, PO Box 89, Oatley West, NSW 2223, Australia, price Aust$299.

Quiz Game. David Pickering, EA vol 53 No 11 Nov 1991 p *73*. il cct. A circuit is given which provides an individual push button and light for a number of contestants. First button to be pressed operates a communal buzzer and excludes other buttons. A reset button is operated by the compere.

Timers

Automatic Light Switching. A R Lyons, *EA* vol 53 No 10 Oct 1991 p 56. il cct. A circuit is presented which switches on exterior lights when the ambient light reaches a low intensity. The lights then remain on for a pre-set period adjustable from 2 to 7 hours.

Narrow Band Modes

Decoders

Improved HF Weather Facsimile Programs. Ben Vester K3BC, *QST* (Technical Correspondence) vol LXXV No 9 Sept 1991 pp 40 - 41. il cct and photos. A description is given of an op amp clipper which provides square wave output to a computer serial port. High resolution software, written in assembly language is available from the author.

S-VGA, VGA/EGA Fax Pics for Listening Post II. Jim Rowe VK2ZLO, *EA* vol 53 No 10 Oct 1991 pp 44 - 45. il graph. A description of an improved version of Listening Post II is given, with better resolution. The kit is available from High Tech Tasmania, 39 Pillinger Drive, Fern Tree, Tasmania 7054, Australia, price Aust$63 including software.

Hardware

PTC_The PACTOR Controller. Martin Clas DL1ZAM and Peter Mack DL3FCJ, *QEX* #116 Oct 1991 pp 7 - 11. il ccts and photos. A complete circuit is described for a PACTOR controller. An 8MHz CMOS version of the Z80 is used as the microprocessor. A series of LEDs indicate the system condition. AMTOR and RTTY can be used; the data can be transmitted in the form of Huffman code or ASCII. A choice of FSK or AFSK is available.

Miscellaneous

PACTOR - Radioteletype with Memory ARQ and Data Compression. Hans-Peter Helfert DL6MAA and Ulrich Strate KF4KV, *QEX* #116 Oct 1991 pp 3 - 6. il diag and graph. A description is given of a new system which combines the benefits of AMTOR and packet. Each packet consists of a header, data, status indicator and check code. A summing technique (ARQ - Automatic Repeat reQuest) eliminates noise from repeated transmissions. The baud rate automatically changes from 100 to 200, depending on transmission path conditions. Data compression uses the Huffman code in such a way that the most frequently used characters require the least time for transmission.

Power Supplies

Batteries and Cells

Longer Life for NiCads - 1. James Moxham, *EA* vol 53 No 10 Oct 1991 pp 30 - 32. il ccts, diag and graph. A general dissertation on the technology of NiCads is given, including the fundamental chemical reactions. Permissible charge and discharge rates are discussed. Techniques and precautions are given to extend useful cell life.

Quantum Ham Battery. (Product Review) David Cassidy N1GPH, *73* issue #372 Sept 1991 p 22. il photo. A review is given of this 12V 2.1Ah sealed lead-acid battery, which is suitable for extended operation of handhelds.

Battery Chargers

Constant Current Charger. Ranjit Singh, *EA* vol 53 No 10 Oct 1991 p 57. il cct. A two transistor circuit is used for constant current battery charging. Formulara are given to adjust the charging current.

Series Regulated

Low-dropout Voltage Regulator. H F Nissink, *EA* vol 53 No 10 Oct 1991 p 57. il cct. A series transistor and an LM317 are combined in such a way that the input/output voltage differential may be as low as 0.1V.

Variations on the 18V/1A Benchtop Power Supply. Rob Evans, *EA* vol 53 No 10 Oct 1991 pp 64 - 66, 68, 72. il cct, diags, graph and photos. A laboratory power supply is described which can be built to give either up to 18V output at 2A, or up to 30V at 1A.

Receivers

Accessories

Antenna Tuner and RF Preamp. Jim Rowe, *EA* vol 53 No 11 Nov 1991 pp 74 - 81. il cct, cmp, diag, pcb and photos. A solid state pre-amplifier and antenna tuner is designed to operate over the range of 500 kHz to 30 Mhz, improving receiver performance. Varactor tuning is used.

Product Review

AOR AR2500 Scanning Receiver. Kirk Kleinschmidt NT0Z, *QST* vol LXXV No 9 Sept 1991 pp 33 - 35. il photo. A review of this equipment is presented, complete with measurements.

Technology

Automotive Engine Control - 1. Tony Mercer, *EA* vol 53 No 11 Nov 1991 pp 32 - 35, 99. il ccts, diags, graphs and photo. A review is given of modern techniques for electronic carburettion and ignition in motor vehicles.

What Your Frequency Display Really Tells You (2). David Newkirk WJ1Z, *QST* vol LXXV No 9 Sept 1991 pp 26 - 30. il diag, graph & photos. A discussion of various methods adopted for display of frequency is given. Accuracy is distinguished from precision.

Our Evolving Network of Communications - 1. Robert Owen, *EA* vol 53 No 11 Nov 1991 pp 28 - 31. il diags, graphs and photos. An overview is given of Integrated Services Digital Network (ISDN). A/D conversion and PCM are discussed, together with X.25 protocol for packet transmission.

Test Equipment

Miscellaneous

'Lightning Meter' for SWLs. Alex Eades, *EA* vol 53 No 10 Oct 1991 p 56. il cct. A simple instrument is described which measures the relative intensity of lightning discharges; time differences can determine distances.

Probes

Poor Man's Logic Probe. Paul Fitzgerald, *EA* vol 53 No 11 Nov 1991 p 73. il cct. A simple probe is presented which indicates a high or low state by the illumination of an appropriate LED.

Transceivers

Home Brew

A High-Performance Easy-to-Build 432 MHz Transverter (2). Ed Krome KA9LNV, *QST* vol LXXV No 9 Sept 1991 pp 18 - 21. il cct and photos. The transverter alignment is considered in this part. The 10W power amplifier is discussed. This is designed around a Toshiba S-AU4 linear 'brick'. An optional 70cm band pass filter is also described as a sidebar.

Glossary of Abbreviations

il The article contains illustrations, a list of which follows.
cct A circuit diagram
cmp A component layout drawing
EA *Electronics Australia*
diag A mechanical drawing
pcb A master drawing from which printed circuits may be produced
QSTVE *QST Canada*
RadCom *Radio Communication*
RadZS *Radio ZS*
73 *73 Amateur Radio Today*

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DIVISIONAL NOTES

VK2 NOTES

Tim Mills VK2ZTM

Another year almost gone. May I, on behalf of the Council and office bearers, wish all members, wherever you may be, the compliments of the festive season and may 1992 be an improved year for all.

Over the holiday break the Divisional Office will be closed for personal visits and the dates will be given on the VK2WI broadcast. Mail will be cleared, PO Box 1066, Parramatta 2124. The fax will be on line (02) 633 1525, and the phone answering machine on (02) 689 2417. The last live broadcast from VK2WI will be on Sunday, 22 December. The first for 1992 will be on Sunday, 12 January. On 29 December and 5 January there will be a morning transmission with mainly pre-recorded material. There will not be any major evening segment, other than the tape being played via the Gladesville ATV segment on VK2TVG on Channel 35 at 7.15pm for those in range of the Sydney transmission.

There are almost 50 clubs and groups in VK2 affiliated with the Division. As part of the Technical and Historical tape which precedes the VK2WI news, it is planned to include a slot for a thumbnail sketch from each group in turn. It can last up to 10 minutes and be submitted by either typed copy or cassette tape. The contents should cover the origin of the club/group, present activities and future aims, whether you conduct classes, operate repeaters, meeting details, membership size and the area or region served; if you conduct field days, contests or awards. In fact, it is to record your history before it is lost or forgotten.

This lack of maintained history was brought home in the Division recently, when some details were sought about the early and subsequent development of Dural. There are some brief details in these columns of *AR* and in some bulletins of the day. There are, however, gaps with minute books and other official records because of cleanups to get rid of the "old" rubbish. To try to reduce some of these gaps, we would welcome any copies which previous office bearers may have tucked away. Minutes, newsletters, photos and anything which relates to the development of Dural and Atchison Street properties. If you can help, please contact the Divisional Office. In fact, anything which relates to the history of Amateur Radio should be checked before it's tossed!

Looking for a Christmas gift or need to drop a hint? The Divisional Bookshop has most of the books listed in this edition of *Amateur Radio*. Call in or contact the office for details.

New Members

These members joined the NSW Division during October, and a warm welcome is extended to them.

H	Bayraktar	Assoc	Lalor Park
H	Brende	VK2LHB	Wahroonga
P T	Britton	Assoc	Manly
P	Chappie	VK2KPC	St Marys
E G	Chittick	VK2EGC	Murwillumbah
P	Collins	Assoc	Rozelle
N	Deitch	VK2ZXC	Port Kembla
B	Edmonds	Assoc	Woodpark
P J	Field	Assoc	Miranda
L	Gay	Assoc	Condell Park
P	Hughes	VK2PVG	Vincentia
W	Hoevenaars	VK2TRY	Glenhaven
J	Mawrey	Assoc	Abermain
S J	Megarrity	VK2LSM	Londonderry
W B	Patterson	VK2LWP	Wagga Wagga
J	Pollock	Assoc	Lavington
G	Ryan	Assoc	Repton
J G	Scherrenberg	Assoc	Castle

A further note to repeater groups. Check the details which appear in the callbook. Are there any corrections required? Send these to the State Repeater Co-ordinator early this month, so the data issue of *AR* which comes out in February is up to date. Any group interested in setting up a 6m beacon in the 50MHz window should register interest with the SRC. It will be on a shared frequency. Much of VK2 has now reached saturation with 2m repeater allocation. It is no longer practical to allocate a channel which does not overlap with another service area. If new systems are required, they will have to adjust coverage and accept co-channel sharing. There is still plenty of space for systems on 70cm, so why not consider this band?

See you in '92

ar

VK3 NOTES

Barry Wilton VK3XV

It is quite some time since VK3 notes appeared in print as we simply have not been able to obtain the services of a suitable "scribe" on a regular basis; however, it is to be hoped the situation will be rectified in 1992.

A lot has happened during the past year, including the purchase of the new property in Ashburton and the setting up of our new office. No longer do we have to pay rent, and the acquisition of the new premises will provide a substantial and secure asset base for the Division in the future.

The Division is in a sound financial position at this time as the result of much hard work and forward planning. However, we must not become complacent, and need to be vigilant and recognise change in the hobby and the needs of today's members.

History shows that the Victorian Division has, over the years, been financially unstable, with periods of prosperity and then, for various reasons, it has undergone a process of decline and suffered substantial losses.

It is a matter of record that when the going is tough, members are generally unconcerned, and the destiny of the Division is left to a handful of hard-working and dedicated people; but, when we are "riding high" there always seems to be an influx of interested members with a multitude of suggestions and new ideas.

More than anything, the Division needs the participation of members with enthusiasm and ideas, and who are genuinely prepared to work to achieve their goals, not simply put forward suggestions and expect them to be implemented by others.

When the Division was in the doldrums, member interest in the administration of its affairs was minimal and presented a problem in terms of human resources. But, now we are financially secure and administratively responsible, another problem has surfaced.

There may be groups of amateurs or organisations which believe they should have more input into the policies and financial management of the Division, and whilst the benefit of the hobby in general may well be their prime motivation for this thinking, it may also be that they desire to further their own personal ambitions and secure a benefit for the group they represent. This may well be to the detriment of the Division and the members as a whole.

If history is not to be repeated, it is advisable to ensure the members' representatives charged with the responsibility of managing the affairs of the Division are persons preferably not aligned with any specific group or organisation which may benefit, either directly or indirectly, by their participation in the decision-making process.

The program for 1992 is one of challenge, and will see a considerable upgrading of member services — the first of which will be the regular opening of our new premises for "disposals" sales on Saturday or Sunday.

Nineteen-ninety-two will see the commencement of a new era of repeater linking through AUSSAT, and further linking of the Sunday Broadcast in country areas.

There is rapidly increasing demand for assistance to members experiencing interference problems, especially in the area of Telecom equipment which suffers from RFI. We expect to be able to provide some positive help in the new year.

Operating costs of the Division have risen during the year, and our income derived from investment capital has been considerably reduced by the property purchase and falling interest rates. The economic recession, which is particularly bad in Victoria and affecting many members, has greatly influenced Council's decision regarding fees for 1992.

Good financial management practice dictates that we should budget to increase our invested capital annually by an amount at least equal to the rate of inflation. To achieve this the Divisional component of the subscription would need to be increased by $5.50. However, in view of the financial hardship being experienced by many members, and having regard to past profits, there will be a fee increase of only $1.25 in the Divisional component for 1992.

The Divisional Office will be closed during the Christmas/New Year holiday period, as has been the practice in recent years. The last day of business will be Thursday, 19 December, and we will re-open on Thursday, 6 February 1992.

Nominations for Council

Nominations for the 1992/93 Council will close at 3pm on Friday, 17 January 1992. Nominations will be accepted only on forms available from the Secretary. Nomination forms must be obtained prior to close of business on Thursday, 19 December 1991. Nominations may be returned by ordinary mail to the office, and will be processed during the holiday period.

Membership Applications

These are continuing to flow in at a healthy rate, and as a number of applications were received in January last year when the office was closed, arrangement has been made for all new member applications to be processed during the holiday period.

Wishing all members a very Merry Christmas and the continued enjoyment of amateur radio in 1992. ar

5/8 WAVE

JENNY WARRINGTON VK5ANW

I'm sitting here, on a very wet Adelaide Grand Prix race day, thinking how ironic it is that I have just spent six weeks in England, and had only one afternoon of rain in all that time! The main focus of the trip was my mother's 80th birthday but, along with my daughter, Wendy, I managed to catch up with a lot of friends and relatives, most of whom I had not seen in 27 years. We also managed two nights in ZL on the way over and two weeks in the USA on the way home, staying with a friend. I would like to be able to tell you of my vast amateur experiences whilst abroad, but you'll have to make do with the truth! Although I spoke to several amateurs on the phone (Kathy ZL2ADK, Shirley GM4LUS, Sheila G3HCQ and Nigel G4IJF (the OM of Angie G0CCI), I actually met only three face to face. Two of those were ZL YLs Alma ZL1WA and Celia ZL1ALK (I'll tell you about that another time, in the ALARA column). The other was John G8JBK, with whom I grew up in Essex (suffice to say that more time was spent reminiscing than discussing amateur radio, though it did get a mention).

I would like to thank Rowland VK5OU for taking over in my absence. You did such an excellent job, I thought I might be able to retire; but I have a sneaky feeling that YL Pam wouldn't be very happy about that.

My first amateur activity on my return was the Old Timers' Lunch at the Marion Hotel on 29 October. As usual, a good time was had by all, but it is always sad to hear of those who became Silent Keys during the year, or who are now too sick to attend. We were pleased that George VK5RX and Thelma Luxon were able to join us after their serious accident, when a train they were boarding in January started to move off. The door prizes were won by the following: Rex Richards VK5DO, Murray Rogers VK5HH, Murray Nicholson VK5YN and Bronte Nitschke VK5KV.

If you would like to attend next year, the date will be Tuesday, 27 October, and if the wives of any of the OMs would also like to attend, we would be only too pleased to have you join the group of ladies who already make it an annual event.

As the September meeting focused on Jota and Aussat, the October meeting was the Display of Members' Equipment night. Unfortunately, only three members bothered to enter this year. (I don't know how many brought things in September). Keith Gooley VK5BGZ showed and described his microprocessor-controlled frequency counter, and won the ICS Award. Mark VK5AVQ brought along his auto-ranging digital voltmeter and a two-tone oscillator. Clarry VK5KL described his 50MHz pre-amp. As none of the above is a beginner in the homebrew "stakes", it was decided not to present the Millar Award this year, as it is given particularly as an encouragement award to newcomers. Our thanks to all who participated.

While I was away, the Yorke Peninsula Repeater Group has been formed, its main object being to build and locate a repeater at Lochiel. On Saturday, 26 October, under the leadership of Paul Cooper VK5AJL, they held a fund-raising day — a most successful one by all accounts. Norm VK5ZAH gave a talk on making printed circuit boards, and later, Grant VK5ZWI and Graham VK5SU gave a talk on packet radio (and how to get started in it). Steve VK5ZNJ had a "gear testing service" to test any pre-loved gear that had been bought. The organisers were very grateful to Dick Smith Electronics for attending, and also to the WIA boys who took ESC & Pubs (Equipment Supply Committee & Publications) and, last but not least, a big thank you from everyone to the ladies who provided the wonderful barbecue. Seems I missed an excellent day!

Diary Dates

Christmas Meeting — Tuesday, 10 December, Woodville Community Hall, 64c Woodville Rd, Woodville (between Port Rd and Town Hall). Meeting starts 8pm; bring your partner and a plate of supper.

The speaker will be Bob Major from the Department of Mines, who you may remember, spoke on Chernobyl earlier in the year. This time he will speak on the volcanoes of Italy, but he assures me it is more a travelogue than a geology lesson. I hope to see you there. I would like to wish everyone a happy and safe Christmas and new year.

ar

VK6 NOTES

HARRY ATKINSON VK6WZ

Attendance was down at Hamfest last month, but the NCRG says business (amateur and commercial) was good. Displays were mounted by about half a dozen electronics firms in addition to amateur displays of ATV, digital modes, club and institute exhibits etc. NCRG officials were delighted with the generosity of trade donors of prizes for the raffles — totalling something like $3000 in retail value. The car park flea market had 21 spaces sold.

WA chapter of WICEN is to update its equipment if an application to the Lotteries Commission succeeds. If the $3000 is forthcoming, it will be matched dollar-for-dollar by the WIA, allowing WICEN to buy new HF, VHF and UHF gear and return the present equipment to its owners. The final "shopping list" will be determined by the outcome of the current local and federal WICEN reviews.

Season's greetings to all from the president and council of the WA Division.

ar

CLUB CORNER

Radio Amateurs Old Timers Club

At the October luncheon in Melbourne, the committee election resulted as follows:

President: Alex Stewart VK3BMS, phone (03) 579 0006. Secretary/treasurer: Harold Hepburn VK3AFQ, phone (03) 596 2414. Publicity/broadcast: Allan Doble VK3AMD, phone (03) 570 4610. Past president: Ken Pincott VK3AFJ. Members: Ken Seddon VK3ACS, John Tutton VK3ZC, John Fullagher VK3AVY.

The broadcast on the first Monday of each month except January will continue at the times and frequencies shown until the return to standard times in April.

145.700MHz FM and 7.060MHz LSB 2300 Zulu

14.150MHz USB beaming north from Melbourne 2400 Zulu

14.150MHz USB beaming west from Melbourne 0100 Zulu

Contributions of interesting items for inclusion in the broadcast and/or the *OTN* journal will be very welcome indeed. The next issue of *OTN* is due in March, so articles are needed now!

And, for those members who meant to send along their $10 subscription a couple of months ago, please accept a gentle reminder. Secretary Harold would be delighted to hear from you.

73 for now and all the best for Christmas and the coming year.

ALLAN DOBLE VK3AMD

ar

OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 300 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS.

Bitter Experience

This letter has been written out of sheer frustration and to forewarn others of the dangers of paying for equipment in advance, whether it be for radio or any other item.

Over the past number of months in a rival magazine a few of you may have noticed articles such as **Captain Communications are Moving" ... "Captain Faces Court Martial" and Captain Apologises.** Well, as far as the moving goes, he certainly did that, and, as for the court martial, I would have given Breaker Morant a better chance.

I don't know of anyone who was apologised to, other than via the other mag. The apology itself was worthless, as the firm is now in receivership.

Since 10 July 1991 when moneys were paid to Captain Comma who, for some eight weeks before that, had promised delivery of a couple of 2m radios, it has been nothing but an uphill struggle to get any truth from them. We paid this money in full as requested, to expedite delivery. Perhaps it was gullible to do so, but we had waited two months already.

The staff of Captain Comma not only conned others as well as myself into handing over money and equipment which has not been returned to its owners, but later requested in the other mag that people write to them as I myself had done but, unfortunately, to no avail.

The lesson to be learned here is not to pay in advance for any equipment. If it is not on the store shelf when you want it, wait until it is or just go to another supplier, no matter what other freebies you may be offered. Dishonest people will always be around to take your money and run!

JIM ZENNER VK2LJZ
PO Box 949
BOWRAL 2576

Who Built Your Tower?

Could you please inform your readers that it has been brought to my attention recently that some amateurs have acquired what they thought was a Nally radio tower, when in fact it was not.

The Nally is a free-standing two-section wind-up tilt-over tower 13.7m (42 feet) high.

If you are going to purchase a second-hand tower, I would be pleased to help you to verify whether or not it's a Nally tower.

You can contact me on phone 018 388 959.

A D ROWE VK3KMN
NALLY RADIO TOWERS
46-48 ELLIOTT RD
DANDENONG 3175

JOTA Thank You

I am writing through *AR* to all readers who were operators at the stations on the weekend of 19-20 October 1991 for JOTA (Jamboree on the Air). A big thank you and well done to all who helped at these stations, also to AUSSAT for use of the satellite links on two metres.

Some operators had girls visit their own radio shacks, some created instant large stations in Guide and Scout halls and at camp sites; still others came along as help and support to operate these stations.

Approximately 46 stations in which Guides participated operated throughout Victoria. To all these people I would like to say many thanks for your time, help and support without which many girls could not have participated in this weekend.

In this modern world with so many other electronic machines available, it is gratifying to see so many Girl Guides interested in radio. They are becoming more confident in front of a microphone, and this all helps considerably with extending their personal self-confidence, which is a part of our extensive program.

To all operators and participants on behalf of the Girl Guides of Victoria, I would thank you very much for your help and participation.

ANNE WATSON
RADIO ACTIVITIES CO-ORDINATOR
GIRL GUIDES ASSOCIATION OF VICTORIA

A Kiwi in VK8

In September this year I had the pleasure of travelling by road some 8000km from Brisbane to Darwin by a most roundabout route. An experience not to be forgotten. Some of this route was with a University Continuing Education Program and some in a campervan.

What wonderful — and different — birdlife you have in both wet and dry areas. Some of the birds we soon began to recognise, but I wonder if some of your readers could please help identify one we could not see, but heard away in the distance when all was quiet, usually mid-afternoons and toward evening in isolated areas.

The call is like the sound of a flute or recorder, monotone, and about "E" or "F#". I called it the "Morse Code" bird, for that's just what it sounded like — Morse Code. On two occasions, near Elliot and Wallara, I jotted down the "call" for a few moments.

Most of my copy was like this: ----. -----. ..--- .. -... ------ etc. Not much sense; what did 9 T 9 mean? Kilometres from — or to?

Then I noticed that sections of the call, over a period of time as I recorded, became recognisable, and a "message" soon became clear — the bird was learning to spell! From my jottings I "unscrambled" this message: ".... .. ? ---. ?? - . -. - --?? .... .- ---.--- .-. .. -??---? - .-. -.-:"

HI? ON?? TEN TM?? HA M, RIT?? O? TRK. (The ?s denote unrecognisable elements of the message).

Decoded, it could read:

"Hi, on to Elliot on time, Ham, right on track!"

Thus assured of my timetable and map-reading ability, I was soon at the camping ground in Elliot ... and into the pool.

Best wishes, and I like your "Tidy Town" idea.

HAROLD B MAUNDER ZL3ABW
23 BUCHANANS RD
CHRISTCHURCH 4 NZ

Titanic Radio Calls

The article by Frank Patrick VK3FJP and Q Foster (*AR* Oct '91) made great reading and revealed much about the early days.

Those of us with "black boxes", so easy to run — unlike old-time gear — (see page 7 of that issue re spark transmitters!) bear a heavy debt to the early operators for their grit and determination.

I must defend Captain Arthur Rostron of the Cunard liner "Carpathia" and its wireless operator and passengers who gave such sterling assistance in the "Titanic" disaster.

The ship which did not answer the "Titanic's" distress calls was probably the Leyland liner "Californian" (although this is still denied by some). She was stationary in ice some 10 to 19 miles away, and her radio room had been shut down shortly before the "Titanic's" distress calls. She later ignored Morse lamp signals and rockets.

The "Carpathia", 58 miles away and travelling the other way, changed course immediately upon hearing the "Titanic". One ironic fact: the "Californian" had sent urgent ice warnings to the "Titanic", but was ignored by radio operator Phillips, busy with private messages to Cape Race.

The "Titanic" struck the iceberg at 11.40pm, Sunday, 14 April 1912. At 12.05am, Captain Smith gave the order to radio operators, Jack Phillips and Harold Bride, to commence sending the distress signal.

In 1912 not many ships had wireless, and the two operators, employed by the British Marconi Company, were not part of the established shipboard chain of command. Messages to the bridge followed no routine procedure.

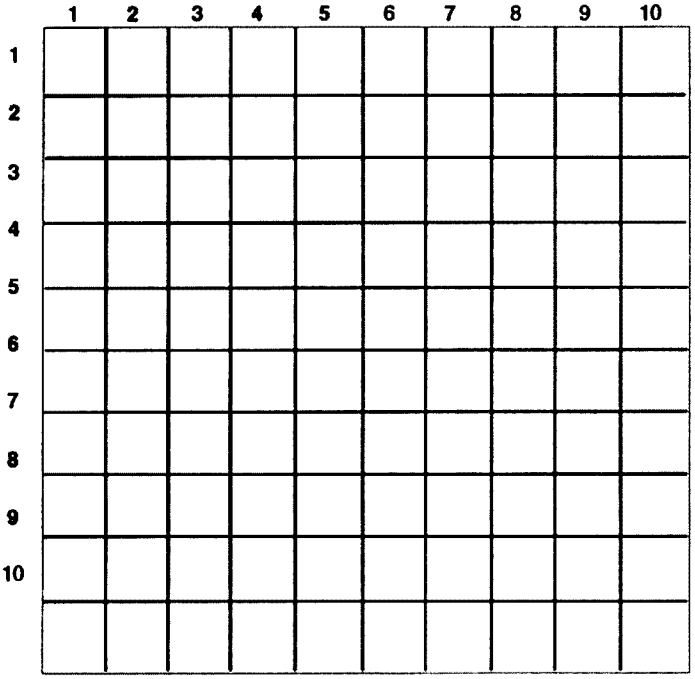
The original distress signal was "CQD", but "SOS" was also known, and the "Titanic" began sending both signals, one of the first SOS calls ever made from a ship in distress.

Several of these messages still exist; one, received about 1am, reads "SOS SOS CQD CQD we are sinking fast — passengers are being put into lifeboats".

Subsequently, regulations regarding radio watch were tightened up, although not specifically recommended by the British Board of Trade Enquiry.

Morseword No 57

Solution page 64



Across:
1 Severe
2 Namely (Latin)
3 Dirty mark
4 Bottom
5 Difficult situation
6 Fairy's tool
7 — in (betray)
8 Ins and —
9 Inter — (among others)
10 Electronic sound

Down:
1 Publicity feat
2 Warble
3 Satisfied
4 Baker
5 Stetsons
6 Picture
7 Gawk
8 Corrosion
9 Ukrainian city
10 Rescue

Audrey Ryan 1991

Thanks, Frank, for stirring up a bit of interest in our history, and especially that "Night to Remember".

IAN C GRIGGS VK2WR
88 EXCELSIOR AVE
CASTLE HILL 2154

Monopole, Not Unipole

In the October '91 edition of *AR* there was an article on a "unipole" antenna by Des Greenham VK3CO. The correct name for this antenna is a "quarter wave folded monopole". The term "unipole" is an old and out-of-favour term for an isotropic radiator. The term "monopole" has been in use in antenna engineering for some time, and I quote from the *IEEE Standard Dictionary of Electrical & Electronics Terms.*

monopole Any one of a class of antennas constructed above an imaging plane to produce a radiatio pattern approximating that of an electric dipole in the half space above the imaging plane.

If you substitute imaging plane with ground plane or radials, the above is a good description of VK3CO's antenna. By using the word "class", the definition avoids any specifics such as construction details or electrical dimensions.

To add a little linguistics to the argument, unipole is out of place. The prefixes 'mono-' and 'di-' come from the Greek, while 'uni-' and 'bi-' come from the Latin. So we have monopole and dipole antenna on one hand with unipolar and bipolar transistors on the other.

You see, I don't like loose ends; that is why I built one myself. I think I will use 10mm tubing for the driven element, as this will give a broader bandwidth.

PETER O'CONNOR VK4KIP
10 SINCLAIR ST
MOOROOKA 4105

A One-Man Team!

I cannot contain my disgust at the complete lack of consideration given the faceless other two team members who participated in the Amateur Radio Operators for Relief Work in China. P55 *AR* October 1991.

Certainly this advertisement appeared in the Hamads section of our magazine, but surely the commercial enterprise responsible could at least have had the courtesy to include the names of the other team members involved!

I am aware of one other team member, but do not know him personally, and I have no other complaint against the firm involved, therefore I have no ulterior motives in commenting on this matter. To the individual/s responsible for preparing this advertisement perhaps a revision of the meaning of the word team, and a study of the basics of common courtesy would not go astray.

ALAN CHRISTOPHER VK4VE
PO Box 686
REDCLIFFE 4020

Re-United by Radio

They quite often say that wonders never seem to cease to happen and that probably also goes for such things as miracles!!

This "miracle" occurred a few months ago, but it took me a while to get around to relating the story to "Over to You".

First of all, I must congratulate *Amateur Radio* journal, which is more or less responsible for the result of my segment on Morse Code published in "Over to You" back in January.

Since being discharged from the army and also gaining my AOCP and licence about a year ago, I was determined to search the airwaves to make a contact with anyone of the members of my old unit, the 36 W/T Section.

I had almost given up the search when I received a letter from my former army O/C, who by chance happened to read my segment in *AR*. So my search ended after all these years of wondering whatever happened to all the members of that group. Thanks Ian Paterson VK2CJP and also Aub Miller VK2EEX for removing that cloud that has been hanging over my head for all these years! The equipment in those days was very heavy to handle, and had quite a few problems, but was a success in the long term.

BERT HARMER VK5AUS
14 SCOTT ST
SEFTON PARK 5083

PS: Members of the 36 Wireless Task Section:

Ian Paterson, Aub Miller, Bert Harmer, D Warren, M Burt, M Knowles, T Maddern, G Crook, R Grove, T Jacobson, D Matherson, V Bayley, K Dawe, K Farr, N Kingsford, P Mahony, V O'Dwyers, S Vickery (reunions are being held for 35-36-37 W/T Sections)

ar

SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:

Mr D G	Finlayson	L70166
Mrs J	Davidge	VK2GI
Mr G	Van Ettekoven	VK2NX
Mr W	Miller	VK2CWM
Mrs Joy	Collis	VK2EBX
Mr R J	Edwards	VK3CZ
Mr Roy	Prowse	VK3XY
Mr R	Gorman	VK3YIB
Mr N	Gee	VK4BNG
Mr E	Pawson	VK4DEP
Mr L	Gardner	VK4FPG
Mr K	Hillyard	VK4VFG

Gerrit (Gerry) van Ettekoven VK2NX, ex VK2PTE

Gerry VK2NX passed away on Saturday, 26 October 1991, aged 62. Gerry was a foundation member of Fisher's Ghost Amateur Radio Club and has been a very active member of the club ever since.

He served as Treasurer for several years and also conducted the 10m net, including the practice Morse transmissions preceding the SSB section of the net. He was also the Morse code instructor for the club; many an amateur operator in the district owes it to Gerry for the code section of his or her licence.

Besides his activities with Fisher's Ghost, Gerry was also a very active member of the VK2 chapter of the RNARS, being a foundation member and also treasurer of that group. He spent many a Saturday at the Naval Cadets College on Snapper Island, putting the callsign VK2CC on air. He was returning home from Snapper Island at the time of his death.

He is survived by his widow Rita, and also his daughter Carol, son Robert and their families. Vale Gerry VK2NX.

FROM ARTHUR HARRIS AND ALL MEMBERS OF FISHER'S GHOST ARC

Russell John Edwards VK3CZ

Russell Edwards died 19 October 1991, aged 66 years. He was a returned soldier of the Second World War and served at Tarakan. Russell was interested in radio from boyhood days, and qualified as a radio amateur in July 1978 with the callsign of VK3CZ.

Russell was a qualified building surveyor and worked in that field for many years.

He will be sadly missed by his wife Jean and son Sterling and his many friends.

JACK FALKNER VK3EB

Graeme Whitehead VK4NYE

With regret, I record the passing of my very good friend Graeme VK4NYE on 25 August 1991. He became a quadraplegic in 1976, and derived much pleasure from amateur radio. He called the activity "the great leveller" because, while on air, his disability was not a disability. Equality and participation was his favourite theme.

He was born in Richmond, Queensland, in 1940, and was always a bushman at heart. Some of his other activities were cattle and

sheep station manager, short-story writer, announcer on 4DD-FM, and he was a Lions Club member until the time of his death. He worked very hard to get a better deal for the disabled, and achieved much.

Graeme came into amateur radio in 1982, and was a founding member of the VK4 Disabled Persons Radio Club VK4BTB, which runs under the mantle of Help Handicapped Enter Life Project, of which he was also a founding member. When he could, he shared the running of VK4 Disabled Persons Net on Friday nights.

Sincere condolences to his wife Bev, his daughter, three sons and two step-daughters. He is sadly missed.

ROLEY NORGAARD VK4AOR

Joy Collis VK2EBX

(See also ALARA Notes, page 46)

"I like amateur radio; I really think it's fine that I'll still be a YL if I live to 99. It's a satisfying hobby; it will certainly do me, 'til they write beside my name the words "Became a silent key'."

Joy VK2EBX did not live to 99 as she had hoped in her verse, but she was an active YL right up to the day her illness put her permanently to bed.

Joy was first licensed about 13 years ago and was very active on the HF bands. She took part in many worldwide nets and contests, and covered the walls of her radio shack with awards. She was always a courteous operator, but was not afraid to stand up to the OMs, if she thought they were being chauvinistic.

Joy also had other talents — she wrote poetry — and in 1983 won the Bronze Swagman Award for Bush Verse.

For many years she was the VK2 State Representative and Publicity Officer for ALARA, writing the column for *Amateur Radio*. Earlier this year she was made the first Life Member of the Orange Radio Club.

Her life reflected her strong Christian faith, and last Tuesday the little church at Yeoval was packed with friends and relatives.

Joy will be sadly missed by all who knew her.

DOROTHY BISHOP VK2DDB
VK1/2 ALARA REPRESENTATIVE

George Harvey VK3CYA

On 8 September 1991, George Harvey VK3CYA of Echuca died peacefully in the Echuca Hospital after being a quadraplegic for 27 years.

The story of George's tragic accident and his more recent involvement in amateur radio was the subject of an article in *Amateur Radio* magazine in January 1990.

George's courage and enthusiasm for life, despite his handicap, was an inspiration to many people who either met him personally or spoke to him "on air".

He held regular "skeds" with many friends, and his absence will be mourned by all.

His funeral in Echuca was attended by a large group of amateurs from far afield, and to his wife Elma and their family, we extend our sincere sympathy in the loss of a great man.

DES GREENHAM VK3CO

BOOK REVIEW

THE ANTENNA EXPERIMENTER'S GUIDE

by Peter Dodd G3LDO

(ISBN 0-9516024-0-3)
Reviewed by Evan Jarman VK3ANI
200 pages, 120 illustrations

Price $20 plus $3 p&p. Our copy came from the author, 37 The Riding, East Preston, West Sussex BN162TW. Telephone + 44 903 770 804.

The humble antenna is the one item of common interest to all radio amateurs. It is the most easily constructed and its correct operation would have more bearing on overall success than any other item in the radio station. It is little wonder it is the most discussed, and written about, item of radio equipment.

Generally the antenna is built using an idea or design seen somewhere. It looked like a good idea, or the gain was just what was needed. It is constructed and then refined in an effort to improve what was built.

In an effort to improve the refining process by making it more systematic, the author of this book has collected various concepts to show how they benefit each other.

This is not a collection of designs. It shows how to measure some of the various parameters that define antenna performance; even provides designs for test equipment.

The book shows how some models for various antennas work. Computer programs are used to perfect, as far as possible, antenna performance before construction commences. This field can be very rewarding, and is devoid of many of the frustrations of building it first. It is quite amazing how changes in things like conductor size can affect performance. It doesn't show this completely — no book can. To truly see this you need to get your hands on a computer; but it does give you an idea of what can be done.

Theoretical antenna design is touched on. A reprint of an article in *QST* on the direct drive ring radiator is a joy for those who consider mathematics to be a tool and not something to be scared of.

The measurement and design work is complemented by a chapter on masts and materials showing what is involved in constructing your creation. Just remember: the bigger they are the harder they fall, and antennas work best when they are up in the air.

The book is rounded off with a chapter of designs of experimental antennas the author has used. It was nice to see a reference to our noble Editor as one of the sources for his ideas (*AR* October 1990).

This is not a reference book. It is a book of ideas that are meant to be put into practice. It is for those who like to experiment and know what they are doing.

The only thing I found irksome was that some measurements are marked with units and others not. I can only assume from my reading that they are all meant to be imperial. Where the inch symbol was not used I kept defaulting to millimetre (or metric) as did others when I showed them the book.

No doubt it will please many of the older operators who are used to them, but those who use metric (which is most) assume them when there is no alternative marking.

The author obviously enjoyed writing this book. It is obvious he has spent many happy hours using the concepts he explains. For those who would like to enjoy experimenting with antennas because they understand what they are doing, this is a good book.

HAMADS

TRADE AOS

● AMIDON FERROMAGNETIC CORES: For LF/HF/VHF/UHF applications. Send DL size SASE for data/price to RJ & US Imports, Box 431, Kiama NSW 2533 (no enquiries at office, pleaae... 14 Boenyo Ave, Kiame). Agencies at: Geoff Wood Electronics, Sydney; Webb Electronics, Albury; Assoc TV Service, Hobart; Electronic Components, ACT; Truscott Electronics, Melbourne.

● WEATHER FAX programs for IBM XT/ATs. RADFAX2 $35, is a high resolution shortwave weatherfax, morse & RTTY receiving program. Needs CGA, SSBhf radio & RADFAX decoder. Also RF2HERC, RF2EGA and RG2VGA, same as RADFAX2 but suitable for Hercules, EGA and VGA cards respectively. SATFAX $45, is a NOAA, Meteor and GMS weather satellite picture receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card & WEATHER FAX PC card, & 137MHz receiver. All programs are on 5.25" or 3.5" disks (state which) & documentation, add $3 postage. ONLY from M Delahunty, 42 Villiera St, New Farm Qld 4005. Ph (07) 35 82785.

FOR SALE — NSW

● ICOM IC202 with IC3PS power supply and IC20L 10W pep amplifier satellite xtals fitted and manuals. S/No 22177, $200. Nick VK2AOH QTHR (063) 625229.

● TS130S $600. FT101E $425. KW2000 valve rig 1.8-30MHz $250. System 80 computer $100. 28MHz T/Rs $150 ea. Aircraft scanner RA-MA $125. MX100 RX.5-30MHz $65. Mobile whips 7-28MHz Hustler. Best offer all gear. VK2AJY QTHR (043) 96 4553.

● TOWER triangular self-supporting 30ft in two sections. Tilt-over. GC. $250 ono. John VK2KAV QTHR (02) 878 5958.

● NEW ZEALAND "BREAK-IN" magazines, approx 170, mostly 1967-1972. Any offers or anything to swap. Brian VK2EFD QTHR (049) 77 2178.

● KENWOOD TS440S/AT HF transceiver, still under warranty with MC-60 deck mike and Alinco power supply 30amp max, $2100. Steve VK2ASG (043) 241 74 1749 AH or (02) 565 9730 BH.

● ANTENNA SUIT ATV Installation RF Industries model COL8 SN 1087 omnidirectional gain vertical tuned to 579MHz $100 plus freight ono. WARC inc, PO Box 294 Wagga 2650 or ph John VK2BXD AH (069) 25 1720.

● YAESU FL2100B amplifier 4 x 572B spare tubes, manual, vgc, $1300. Yaesu FT290R 2m all mode transceiver 30watt linear nicads mobilemount, vgc, $600. (02) 971 9795.

FOR SALE — VIC

● MICROWAVE MODULES 432MHz Linear Amp, 50w out 10w input, model MML432/50, S/No L432/502802198, $150. Gil VK3AUI QTHR (03) 808 2794.

● YAESU FT707 unused, $1200. FP700 P/S $300. FC700 ATU $250. 5 band trap vert, $75. FDK 2M FM xcvr with 4ch, $100. Galaxy V Valve HF xcvr, complete, $350. John VK3GU QTHR (051) 56 6110.

● ICOM 735 transceiver ser 01040 with AT150 auto antenna tuner, ser 01993, complete with microphone and handbooks gwo in original cartons, $1250. Stan VK3AGT QTHR (058) 58 2426 AH.

● TR10/KENWOOO TS500 & PS500 spare valves $125. Werner Wolf 10/15m 5-element duo bander $120. KENWOOD BS-5 pan adaptor for SM220 $50. RCA 6146B tubes, pair, as new $30. Chirnside 2m ringo $50. 6DQ6A valves $5. Assorted valves $15. Brendan VK3KFB, 20 Leach St, Briar Hill 3088.

● YAESU FT209RH handheld transceiver sn223400 with battery pack, rubber duck antenna, trickle charger $295. Santron GT838 CB transceiver, sn00818, 40 channel, 12 volt, with mic, $45. Pair of Pioneer 40W, 8ohm 10cm dia tweeters, new, $20. VK3BKU QTHR (03) 764 4457.

● MALDOL HS260 HF/VHF SWR/Power meter 12W to 120W ranges, manual and box, ec, $50 ono. Paul VK3EPD (059) 83 1771.

● YAESU FT-480R 2m multi-mode transceiver, $450 or negotiate swap for IC551 or TS660. Chaa VK3BRZ (052) 82 3167 AH Only.

● KENWOOD TS440S A/T HF txvr with mic, manual DC lead, $1595. ICOM IC2E 2M HT with battery charger, $160. Bert VK3BH QTHR (03) 857 9438.

● SPECTRUM ANALYSER HP8558B+182C to 1.5GHz, $2200. Signal Generator FM10C Singer and plug ina to 513MHz, $300. Manuals included. Bearcat 220 scanner, $50. All units operating but collecting dust! David VK3YIZ (03) 718 2293.

● YAESU FT820B 6m SSB rig C/W mic, AC/DC pwr leads and 50MHz band xtal, $375. YAESU FT901DM FV901DM combo. Rig has mem option fitted and VFO has 40 mems, C/W YD-148 desk mic and all leads. Top DXing rig, $900. TOKYO HY-POWER HL110V 2m linear 2.5/10W in gives 120W output. Built-in RF amp, $425. Delivery to Melb city area no problem. I will haggle on prices. Bert VK3TU (052) 78 2374 AH.

● YAESU FT1000 top of the range txcvr, Immac cond, hardly used, 200W output BPF-1 fitted for dual bend receive MD1 desk mic as new in boxes, $4500 ono. (054) 22 3985.

FOR SALE — QLD

● VARIAC VARIABLE TRANSFORMER 500W cat/no 273-9504 input 240V output 0/260V 2.5 amps. Micronta lab instrument, $140. Freight extra. Barrie VK4LN QTHR (074) 82 2675.

● OSCILLOSCOPE SOLARTRON type CT436 dual beam 6MHz $200. Belden RF bridge, $25. Heathkit PSU 0-30Volt lamp, $25. Heathkit audio generator $35. Two video cameras, monochorme, one without lens, $35 ea. Frequency counter 500MHz home brew, $180. Norm VK4ZFQ not QTHR (077) 78 4641.

● YAESU FT747GX serial no OE320030 10 months old, hardly used, $950. Manual and original carton. Brian VK4BOW (077) 86 2367 home (077) 86 2108, fax (077) 86 1815.

● TEKTRONICS CRO model 524AD serial 006531 working $50. Bill VK4WO QTHR (07) 359 8808.

FOR SALE — SA

● ATN LOG PERIODIC ant good cond $700 ono. VK5RI QTHR (088) 93 4001.

● YAESU FT101E HF txvr with manual, new finals, ec, sn7G280503 $450 ono. Michael VK5CK (085) 84 1354 AH, (085) 84 7101 BH.

● DRAKE TR4C transceiver s/n41213, A-4 power supply & RV5C external VFO 260W 80-10m, ec, $650 ono. Heath DX40 transmitter and VF-1 ext VFO 70W 160-10m, 1957 vintage wireless, $120 ono. Doc VK5HP (086) 45 4971, (086) 45 4168.

FOR SALE — WA

● NEW MATCHED PAIR 8950 lx valvss, cost $126, sell $90 post free VK area. VK6CH (09) 377 1283.

● KENWOOD 530S $575. Kenwood antenna tuner AT230, $380. One 50ft wind-up maat with quad and rotator, $365. Prices neg. (09) 277 9264.

FOR SALE — TAS

● SONY ICF2001D World Band Receiver. Current model covers SW, MW, FM & aircraft bands, cost $900, sell $650. Also 2 active antennas, Technikoop 3to suit Sony $160 ono. Deceased estate. (003) 44 4333 or (003) 27 2258.

● SATELLITE TNC/Modems package, TNC320 and ext 1200PSK and 9600FSK G3RUH modems in case with power supply. All new. TNC320 does HF & VHF packet, also includes cables to radio and computer, $720. Dennis VK7YAO (002) 24 0518.

● MFJ-1278 DATA CONTROLLER S/No 3017730 with multi-grey level mxxiem for SSTV/FAX and 2400bps modem. Includes "Multicom" software for IBM PC, cables and manuals $600 ono. Damien Vale VK7CDI (003) 26 0410 BH, (003) 95 4153 AH.

WANTED — ACT

● BOOK "Practical Television Circuits", 2nd edition, by REF Street, Newnes 1968. Also 1st edition, FJ Camm. J Weaver, PO Box 398, Woden ACT 2606.

WANTED — NSW

● VALVES 6146 6146B 6883 6LQ6 6MJ6 6JE6C Atlas transceiver, any model, any cond, details to VK2DMS QTHR (066) 53 2463 or (02) 567 4560.

● HF 7.0 to 30MHz RF RX preamp. 440-450MHz T/R valves or transistors. VK2AJY QTHR (043) 96 4553.

● TUNING DIAL for Johnson Viking Ranger transmitter, also need operating & service manual. Brian VK2EFD QTHR (049) 77 2178.

● MANUALS INFO CIRCUITS extras to suit Drake R-4 HF receiver. Wayne (067) 47 4636 Box 187, Quirindi NSW 2343.

● ATLAS TRANSCEIVER, any model, any cond. Valves 6883 (12v 6146) 6146 6146B. VK2DMS QTHR (066) 53 2463 or (02) 567 4560.

● HIGH GAIN TH3JR beam, balun, cable & rotator to suit, to be A I cond. VK2FFA Peter (043) 24 4160.

● COPY OF CIRCUIT diagram and details of YAESU FL DX400 HF transmitter. Will pay all costs. Jim VK2AJT QTHR (044) 21 2786.

WANTED — VIC

● COLLINS 30S1, will pay top price for linear in gc. Roth VK3BG (03) 725 3550.

● CIRCUIT DIAGRAMS or manuals for Rangemaster FM25H, made by Rangemaster Equipment in Brisbane. Any info would be welcomed. Brett VK3JHP QTHR (03) 584 4230.

● YAESU FT747 HF xcvr, details to Ron VK3OM QTHR (059) 44 3019.

● AMATEUR RADIO MAGAZINE August 1985 and January 1986 issues, will pay current rate as well as postage. Ray VK3MBU QTHR (051) 74 1181.

● FL2100Z AMP or equivalent. Must be in good work cond. Prepared lo pay up to $700. (03) 547 0910.

WANTED — QUEENSLAND

● KEY TO FIT Philips FM828 mounting bracket. David VK4DJC (079) 38 1263.

● CIRCUIT of ANTENNA TUNER for FR7700. Will pay for copying costs etc. Murray VK4AOK QTHR (07) 379 7815.

● CIRCUIT DIAGRAMS & information for a Tamaphone radio telephone, 6ch model T-462MX transceiver. Reasonable cost paid. VK4CEM QTHR (079) 78 3430.

● TRACTOR UNIT for Epson LX 80 printer, must be good usable cond. Price to VK4KAL QTHR (079) 85 4168 any time.

WANTED — SA

● 14MHz TIP FOR HUSTLER mobile antenna. VK5BHH Hank (065) 37 0255.

6M BASE RIG; 204BA HF Yagi; homebrew HF linears, basket cases or not; Heathkit coax switch; old bug keys; tubes 3/300, 2.5/300, 3.5/750 and ceramic sockets; Icom 720; Yassu FT830S. "Doc" c/- VK5BWR Whyalla ARC (086) 45 4971 BH, (088) 45 4168 AH.

WANTED — TAS

● ICs RTL 14 pin DIL, new or on old computer boards. Motorola MC700P or MC800P series. 3.6V supply rail. EGS MC880P, MC890P, MC889P, MC817P, MC891P, MC8918P, MC892P, MC888P, MC824P, MC825P, CμL9960, Fairchild MC1013P, CμL9959 Fairchild. MC1035, MC1026. Any help would be appreciated. Trevor VK7TB QTHR (003) 24 4289 BH, (003) 98 2118 AH, fax (003) 26 5039.

STOLEN EQUIPMENT

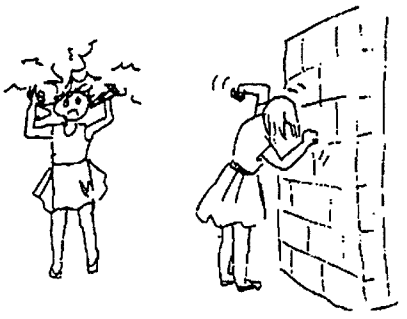
Stolen from P Overton VK2OG, 32 Fuchsia Cres, Quakers Hill 2763 on 8 October 1991: One Icom IC-02AT handheld, ser 406070630.

Stolen from Fiona Carmichael, PO Box 397, Mentone 3194, May 1991: President HR2510 ser 95000177.

Stolen from Cliff Bastin VK6 Div WIA President VK6LZ, 28 October 1991: Kenwood TR2500 2m HH ser 4101224.

Stolen from Christine Bastin VK6ZLZ, 28 October 1991: Kenwood TR2500 2m HH ser 4030422.

Stolen from VK6ID, 25 August 1991: Kenwood TS440S ser 7031310. Two x Philips UHF CB HH, model SXA (ch17 & 20). Two x Philips UHF CB HH, model 323 (ch17 and 20). King Air aircraft band transceiver. Realistic scanning Rx with BNC socket.



Sally Grattidge VK4MDG gives her artistic impression of the difficulties of getting the WIA Slow Morse Transmissions correctly published in AR.

Hamads

Please Note: If you are advertising Items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
•Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
•Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
•Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
•QTHR means address is correct as set out in the WIA current Call Book.

•WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
•Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in 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: $25.00 for four lines, plus $2.25 per line (or part thereof) Minimum charge — $25.00 pre—payable.

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Solution to Morseword No 57
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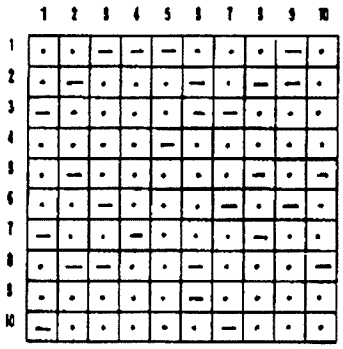

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VK2BWI nightly at 0930 UTC on 3550 kHz

VK2RCW Continuous on 3699kHz and 144.950MHz 5wpm, 8wpm, 12wpm

VK3RCW Continuous on 144.950MHz 5wpm, 10wpm

VK4WIT Monday at 0930 UTC on 3535kHz

VK4WCH Wednesday at 0930 UTC (0830 UTC daylight saving) on 3535kHz

VK4AV Thursday at 0930 UTC on 3535kHz

VK4WIS Sunday at 0930 UTC (0830 UTC daylight saving) on 3535kHz

VK5AWI Nightly at 1030 UTC on 3550 kHz

VK6RAP Nightly at 2000 local on 146.700MHz

VK6WIA Nightly (except Saturday) at 1200 UTC on 3.555MHz

The Tradition Continues...

YAESU FT-990 HF ALL-MODE TRANSCEIVER

Take a quick look at the all-new FT-990 and you'll soon see the similarity to the top-of-the-line FT-1000... and for good reason. The incredible FT-990 embodies many of the advanced features and ease of operation of the FT-1000. But in a more compact, economical package that sports several new advances in both transmitter and receiver design.

2 YEAR WARRANTY!

Designed For Easy Operation

Just like the FT-1000, Yaesu have designed the FT-990 to be as easy as possible to operate. The front panel layout puts all frequently used controls right where they should be..... at your fingertips. All controls are clearly labelled and the digital display provides an abundance of information in an uncluttered and easy to read format. The front panel keypad offers one-touch band selection (160m - 10m) with 2 independent VFOs per band and 90 memories that store the operating data held in both VFOs. You can't help but appreciate the large back-lit analogue meter rather than those confusing bar-graph meters found on other transceivers.

Direct Digital Synthesis (DDS)

Two 10-bit DDS and a magnetic rotary encoder provide silky-smooth VFO tuning, pure local oscillator signals, and very fast Tx/Rx change-over... and that's very important for QSK CW and digital modes. The DDS is teamed with an extremely low-noise, high performance receiver front-end using a PIN-diode controlled push-pull RF amplifier followed by a quad-FET ring mixer. The result is a very wide receiver dynamic range from 100kHz to 30MHz. Transmitter signal purity is also enhanced, with circuit noise nearly 90dB down from the carrier.

Unique Features

- Customizable RF Speech Processor - Yaesu's unique Frequency Shifted Processor (FSP) lets you shift the IF passband of your transmitted SSB signal to provide maximum punch with your voice/microphone combination.
- Digital Audio Filtering - Razor sharp audio filtering is available for tough SSB and CW reception conditions through the use of an astounding dual digital Switched Capacitance Filter (SCF) with independently adjustable selectivity skirts.
- Packet/RTTY - Separate interface jacks for a RTTY terminal unit and a Packet TNC are provided, while the mode selection buttons disable the mic automatically in the digital modes.

Convenience Features

- A highly efficient AC switch-mode power supply is built-in! It allows high duty-cycle transmission while keeping the weight way down, saving space and the added expense of external power supplies.
- An in-built Automatic Antenna Tuner with 39 memories is standard!
- Modular construction maximizes selectivity and makes servicing easy.
- Effective interference rejection is facilitated by IF shift, IF notch, IF bandwidth and SCF audio controls.
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IC-R7100

IC-R100

IC-R72

IC-R1

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