Volume 73 Nos 1 & 2
January/February 2005

Amateur Radio

$6.50
incl GST

WIRELESS INSTITUTE OF AUSTRALIA

The magazine for **AUSTRALIAN** radio amateurs

How to build a Q meter

Jim Tregellas VK5JST

MORE ABOUT

Antennas

Part 2 of
Drew Diamond VK3XU's
A compact, effective vertical antenna for 160 metres

Rob S Gurr VK5RG concludes his series on wire antennas

Amateur Radio INDEX 2004

9 770002 685024 02

BENELEC

YAESU

Experience the Ultimate.....

"The Radio": FTDX9000

FTDX9000MP 400 W Version HF/50 MHz

Dual Analog Meter Sets, LCD Display, Memory Card Installed, Main and Sub Receiver VRF, Full Dual RX, Switching External Power Supply/Twin Speaker Enclosure.

To be Launched & Seen @ WYONG Fieldday in February '05

FTDX9000D 200 W Version HF/50 MHz

Large TFT Display, Built-in Memory Board, Main and Sub Receiver VRF, Full Dual RX, "μ" Tuning (3 modules) Installed, Internal Switching Power Supply.

Detail Technical Overview on www.benelec.com.au

FTDX9000 Contest 200 W Version HF/50 MHz

Dual Meters + LCD, VRF Installed in Main Receiver, Extra Key and Headphone Jacks, internal Switching Power Supply.

.....the world is @ your finger tips

www.benelec.com.au

Authorised Yaesu Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosound.com.au

Action Communications

VIC
Strictly Ham P/L
Tel: 03 9729 7656
sales@strictlyham.com.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8342 4700

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

Amateur Radio

Volume 73, Number 1 & 2
January/February 2005

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Publications Committee Members
Brenda Edmonds VK3KT
Ron Fisher VK3OM
Don Jackson VK3DBB
Evan Jarman VK3ANI
Tom Potter VK3UBS
Bill Roper VK3BR

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

A proposal for reforming amateur examination processes (Opinion) 18
Ian Jackson VK3BUF

Peter Naish VK2BNP (Silent Key) 27
Michael Owen VK3KI, Barry White VK2AAB, Chris Jones VK2ZDD

Greetings from the Cook Islands 27
James Goodger ZK1DG

Amateur Radio Magazine Index 2004 56

TECHNICAL

Building a Q meter 5
Jim Tregellas VK5JST

A compact, effective vertical antenna for 160 metres. Part 2 – Construction 12
Drew Diamond VK3XU

Some useful wire antennas for HF. Part 3 23
Rob S Gurr VK5RG

The Yaesu FT-7B and the FT-77 (Know your secondhand equipment) 30
Ron Fisher VK3OM.

COLUMNS

ALARA 28
AMSAT 44
Beyond our shores 46
Contests 48, 49
Club news 41
Directory 64
DXCC Listings 43
Editorial comment 2
Gridsquare standings 21
Hamads 62
HF predictions 60
Know your 2nd hand equipment ... 30
Opinion 18
Over to you 22
Silent keys 17, 22, 27, 31, 39, 47
Spotlight on SWLing 55
State news 34
VK1 news 34
VK2 news 34
VK6 news 35
VK4 news 36
VK7 news 37
CRARC 40
Try this 20
VHF/UHF – an expanding world 54
WIA comment 3
WIA News 4

Our Cover this month

The Q meter. See Jim Tregellas VK5JST's article on page 5

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
Business hours: **10am – 4pm weekdays**

National Office staff

June Fox	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
	Robert Broomhill	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ewan Mcleod	VK4ERM
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Treasurer	David Pilley	VK2AYD

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
Education	Ron Smith	VK4AGS
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
FTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	t.b.a.	
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glen Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

From DX to emergency

2005 has started with a marvellous response across the world to the tsunami disaster in the Indian Ocean. An Indian DXpedition had at long last been able to operate from the Andaman Islands but instead found itself a major contact with the outside world when the waves struck. From DX to emergency communication without the DXpedition even starting. This is just one of many amateur operations set up across the region to provide emergency communications in response to the disaster. Links to reports on specific amateur operations are on the wia.org.au web site. We express our thanks to all amateurs who helped in this very necessary amateur operation and congratulate them on their selfless dedication to provide communications in a time of much need. Theirs is a great example of amateurs helping their fellows.

Over the Christmas - New Year break I have been considering several aspects of Amateur Radio magazine: -

1. For several months now we have not been able to provide a DX column and I have not had one comment about its non-appearance. Does this mean the Internet now carries all the news of DXpeditions, special event stations etc and AR magazine cannot provide the up to date information most operators require? Do we just need to publish a short list of future DXpeditions with their websites and short paragraphs on special event stations?
2. In a somewhat similar way our propagation charts generate no feed back. No one seems to want different circuits or comments on possibly the ones they use most and would like to have in hard copy in the magazine. Does this mean there is no further need, as the Internet now allows access to ionospheric data and DXers run their own prediction programs?

I would appreciate some comment on these topics. There is of course the matter of "What do we provide, in the only Australian amateur radio magazine available to the public and aspiring amateurs, to those who are interested in learning more and need pointers as to when to listen and on what frequencies and when they might find stations operating from exotic locations."

In this issue I have tried to provide a balance between technical articles, without which AR is not an amateur radio magazine, and news and comment. Several items I had hoped to publish have had to be held over until March AR and I apologise for that. Some of the material in this issue has to be published regularly to keep the participants updated and this issue got caught with DXCC, Grid Square and Operational Satellite data. We also had to publish the RD 2004 Contest results and the rules for the 2005 John Moyle Field Day in March. To help clear this backlog you have a 64 page issue, but March will be back to 56 pages.

I wish you all a Happy New Year and I hope we will not have to provide communications support to any major disaster this year. However please remember to keep the emergency equipment ready to operate at short notice just in case.

73 Colwyn VK5UE

February events

Central Coast Field Day
Wyong Racecourse,
Sunday 20 February

VK3GHA's HAMFEST Sale
Sunday 27th February, 2005
10am to 2pm
Healesville Memorial Hall
Maroondah Highway, Healesville

More details elsewhere this issue

Michael Owen VK3KI

A year in review

This is the first "WIA Comment" for 2005.

2005 is not only a new calendar year, but also a new financial year for the WIA.

So, let me look back over a year of great change, and see what has been achieved and what lessons can be learnt, with the new national WIA in place for just over half of that year.

For the new board I think that there have been three major issues in the first period of the restructured WIA.

The first has been the acceptance of the new structure by what used to be the Divisions, with Amateur Radio New South Wales the last to emerge just before Christmas as supporting the national WIA. Each of the former Divisions has recorded its support of the national body and its basic relationship with the national body in a formal agreement.

Now we have 3 former Divisions as separate organisations, offering services as a local club, or maintaining repeaters or providing other services for their members and the other 4 former Divisions have either wound up, or are in the process of winding up.

The second major issue to emerge was BPL. Experience overseas indicates that this is a threat to all users of the HF spectrum, not just amateurs. A small group has addressed the issue, ultimately proposing to the ACA an approach that turned out to be almost entirely consistent with the approach that the Authority has now announced that it is taking.

The other major issue has been the ACA's publication of the result of its review of the amateur service regulation, with the proposed changes to the structure of amateur licences, including the introduction of the Foundation Licence.

That publication occurred almost immediately after the WIA adopted its new Constitution, and led initially to much debate, and then to a great deal of work, as the Board and various experts and groups of experts responded on various aspects of the restructure.

One fundamental matter is the issue of how can we better serve the candidate. In the last issue I raised the issue of accrediting assessors, so that the candidate could get immediate guidance. The only responses of which I am aware have been supportive. That has now been put to the ACA, as has a suggested syllabus for the Foundation Licence, prepared by a small group of experts. Both documents have been placed on the WIA website.

These have been the major issues.

Have we done any more than address those issues?

I think we have.

We have tried to work closely with the Editor and the Publications Committee, trying to ensure a much closer working relationship between the Board and those responsible for the magazine.

We have been supported by a brilliant broadcast team, and have tried to ensure that as much information as possible is made available through the broadcasts.

Perhaps the WIA has, in the last 6 months, changed sufficiently and done sufficient to be able to say to those who decided to "wait and see" that they should now consider becoming a member.

We have changed the website, updated it continuously and released as much information as possible as quickly as possible through the site.

In short, we have worked very hard to ensure that anyone who wants to know what the WIA is doing can find out.

In terms of representing the amateur service, we have had some successes. The WIA proposal that the 160 metre band allocation become primary rather than secondary was accepted.

The WIA submission to the ACA in relation to proposals affecting the 5.8 GHz band was accepted.

The WIA awaits a response from the ACA in relation to its proposal for spot frequencies around 5 MHz.

Much time has been devoted to meeting with the clubs, seeking their support, seeking their views, formulating the criteria for affiliation, and finally negotiating an acceptable liability insurance scheme for the WIA and the clubs.

We have adopted the discount card, previously a privilege of Queensland members, adopted a new membership certificate and caught up with sending them out.

The various national committees, coordinators and representatives continue to serve the WIA, undertaking their various tasks, ranging from involvement in the preparation for the next ITU World Radiocommunication Conference in 2007 to managing contests and awards, coordinating WICEN and many other aspects of the WIA work.

Whenever I try to summarise what the WIA is doing, I am amazed at the number of people doing so many things, for the benefit of amateur radio, and for the benefit of WIA members, and I am also amazed at the number of people we still need, given the extent of our activities.

Yes, I think that many people have worked very hard to make a better WIA, and a more effective WIA, and we have had some good results.

But there is much to be done. Not merely finishing the things that we have started, but doing some things better.

In each state there is an Advisory Committee, created under the WIA Constitution, comprised for the first 3 years from May last year of the members of the former Divisional Councils who were prepared to be a members. The Advisory Committees will be elected every 3 years after that.

To date we have really allowed the Advisory Committees' role to evolve, and while clear directions have been adopted in some states, in others there is uncertainty as to their role.

It seems that the role of the Advisory Committees will vary from area to area, and perhaps it is now time to start defining roles and perhaps even tasks,

continued on page 11

WIA news

Vale Peter Naish VK2BPN

On Sunday 9 January 2005 Peter Naish, VK2BPN, secretary of the WIA and Chairman of Directors IARU Region 3 passed away in St Vincent's Hospital, Sydney.

A moving service for Peter was conducted at St Kevin's Catholic Church, Eastwood, on Friday, 14 January 2005. Secretary Don Beattie, G3OZF, represented IARU Region 1, and Region 3 secretary Keigo Komuro, JA1KAB, represented IARU Region 3 and JARL. A number of the members of the WIA Board as well as many other friends were also present.

A full tribute to Peter is published elsewhere in this issue.

Amateurs provide emergency communications

Shortly after the Tsunami devastated so many places in Asia on 26 December 2004 with such tragic loss of life WIA National WICEN Coordinator John Weir, VK3ZRV placed a number of stations on standby in case communications to the devastated areas were requested. This did not occur, and ultimately the stations were stood down.

Amateurs were able to assist with national communications in a number of countries.

While many reports have been placed on the WIA website, there is no really comprehensive overview at this time.

However, local newspapers have carried stories about the contribution of amateurs. For example the Indian newspaper, Hindu Times has reported on amateur radio activities during the emergency, and the Singapore Straits Times carried a story on the contribution of the Indian amateurs on Andaman Island.

WIA publishes its suggested Foundation Licence syllabus and accredited assessors framework

Last year the WIA Board appointed a small working group of experts to prepare a draft syllabus, initially for the proposed Foundation Licence, and based on that, for the proposed standard and advanced licences. In addition, a framework for the accreditation of assessors of competency in amateur radio has been prepared.

The working group comprises Ron Bertrand, VK2DQ, Lee de Vries VK3PY, Carlo Gnaccarini VK3BRZ and Fred Swainston, VK3DAC.

The suggestion of accredited assessors was raised in the WIA Comment column in the December 2004 issue, and to date the only feedback has been supportive.

The WIA proposes that the present system of invigilators/examiners run parallel with the proposed assessor accreditation system, allowing time for clubs, the heart of any widespread system to have their people accredited. Indeed, if because of distance or other reasons, the present system continues, particularly in remote areas, the WIA believes that is better than having no facility at all.

The WIA has forwarded the documents to the ACA as drafts for its consideration, and has published them on its website, www.wia.org.au

Club affiliation and insurance documentation posted

In mid December 2004 the WIA National office posted explanatory documents and application forms relating to club affiliation and insurance to every club that could be identified.

These documents are now available for download from the WIA website, under "Clubs".

It is hoped that as many clubs as possible will become affiliated with the WIA, and give serious consideration to the public liability insurance that has now been made available.

AX for Australia Day

Australian amateurs were allowed to use the AX prefix to celebrate Australia Day on January 26, with the period of use running from 26 0001 to 26 2359 hours local time.

WIA releases BPL Report

On 14 December 2004 WIA President Michael Owen, VK3KI, announced that the WIA Board had adopted a report prepared by its specialist group, the WIA BPL Working Group, charged with the responsibility of monitoring and analysing the development of BPL - Broadband over Power Lines.

The report is a comprehensive review of BPL in the Australian context

The report contains a description of BPL, its advantages, disadvantages and risks from the perspectives of the relevant stakeholders. It concludes that the WIA is not opposed to BPL per se, but is opposed to conduct that results in substantial interference with radiocommunications or substantial disruption or disturbance of radiocommunications. The WIA believes that is fortunate that BPL is not the only way ahead, as it is confident that advances in emerging technologies will meet Australia's growing need for Internet access.

ACA announces conditions for BPL trials

The WIA wrote to the ACA on December 9 outlining the WIA concerns as to the possible interference caused by BPL trials to the HF radio spectrum. The Authority replied to the WIA addressing the WIA concerns and on January 21 2005 the ACA released the guidelines applying to such trials.

The WIA has published the two letters on the WIA website and added a link to the ACA BPL pages which include the guidelines.

WIA director interviewed on Melbourne radio station

WIA Director Phil Wait VK2DKN was interviewed on Melbourne FM radio station 3MDR in relation to BPL issues. The station transmits on 97.1FM and each Saturday between 12:00-14:00 hours features a program called TekTime.

Australian Amateur now primary at 160

The ACA has now published the Australian Radio Frequency Spectrum Plan, replacing the earlier plan of January 2002.

In identifying the changes made to the Table, the Authority says that it has promoted the amateur service to primary status in the 1825 – 1875 kHz band. Previously the amateur allocation at this band was secondary.

The WIA is particularly pleased, as this change accepted in full the WIA's submission made during its involvement in the consideration of the draft table.

Interestingly, despite removal in some states, the band 420 - 430 MHz remains allocated on a secondary basis to the amateur service.

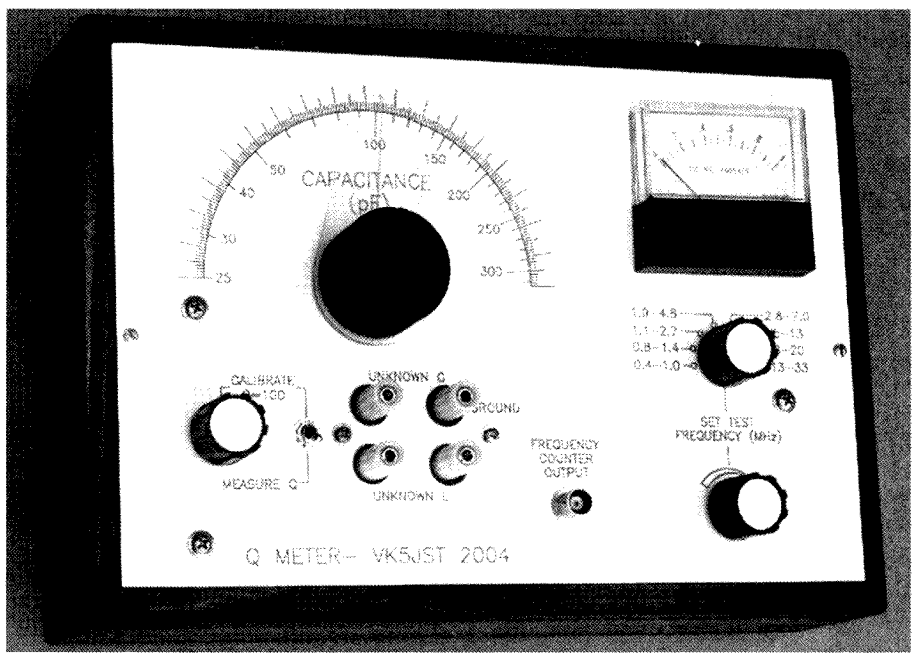
ar

Building a Q meter

Jim Tregellas VK5JST

Want to design and measure inductors? Want to measure small capacitors at their frequency of use? Want a cheap signal generator? This is the one to build!

Q meters have been around since the 1930s. They are still available, and a search of the internet will reveal that they cost upwards of $3,000. To some extent they have been replaced by instruments such as network analyzers, but what radio amateur can afford the $60K price tag for such equipment? Apart from the price problem, the sheer automation of such instrumentation often makes it difficult to develop an engineering feel for what is going on, and so the manually operated Q meter has a lot going for it.



The principle of operation of the Q meter is based on the series resonant LC circuit. Of course numerous mathematicians have analysed this circuit ad nauseum, creating great confusion and complexity. But what is going on is really quite simple.

At resonance, if the circuit is efficient (low losses), the inductive and capacitive reactances are equal but of opposite sign, and very much larger than the loss resistance. Because of their opposite phases, the voltages across the inductor and capacitor cancel, leaving the applied voltage to appear across the loss resistance. This establishes the current which flows around the circuit, generating much larger voltages across the capacitor and inductor than across the loss resistor, and the circuit thus exhibits a voltage gain. If the losses are reduced, the voltage gain and selectivity of the circuit will further improve. This brings us to the best definition of Q, and explains how the Q meter works (see Fig 1).

This also is how a crystal set works. A very small AC voltage from the aerial is selected and magnified by the tuned circuit, appearing much enlarged across the tuning capacitor where it is rectified and applied to headphones. No amplifiers or power supplies, and no wonder Grandpa got excited.

So Q is very important. As Fig 1 shows, we measure it using a calibrated wide range RF signal generator (to generate the input voltage E) and a high impedance AC voltmeter to measure the voltage across the tuning capacitor. If E is known and fixed then we can calibrate the AC voltmeter directly in terms of Q.

The inductor we are designing/testing is of course L. Note that the losses in most well made capacitors are far less than those existing in practical inductors and can generally be ignored. Certainly that must be the case in this test circuit, where the tuning capacitor will have a Q much greater than 1000, and hence negligible losses, if it is chosen as detailed later in this article.

The reasons for this are not hard to understand. Firstly, the dielectric is air, and the only less lossy dielectric which could be used is a vacuum. Secondly, capacitors are collections of short thick conductors (the plates) where the resistance of each plate appears in parallel with those of the other plates - resulting in very low resistance. Inductors on the other hand are just one long thin conductor.

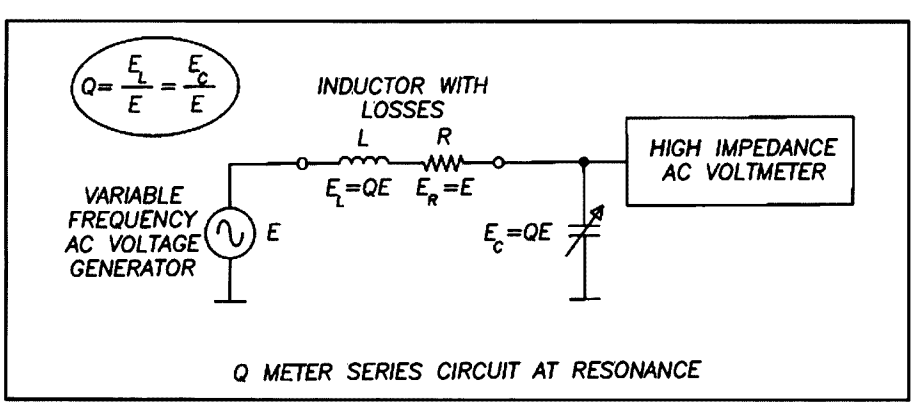


Fig 1 – How the Q Meter works.

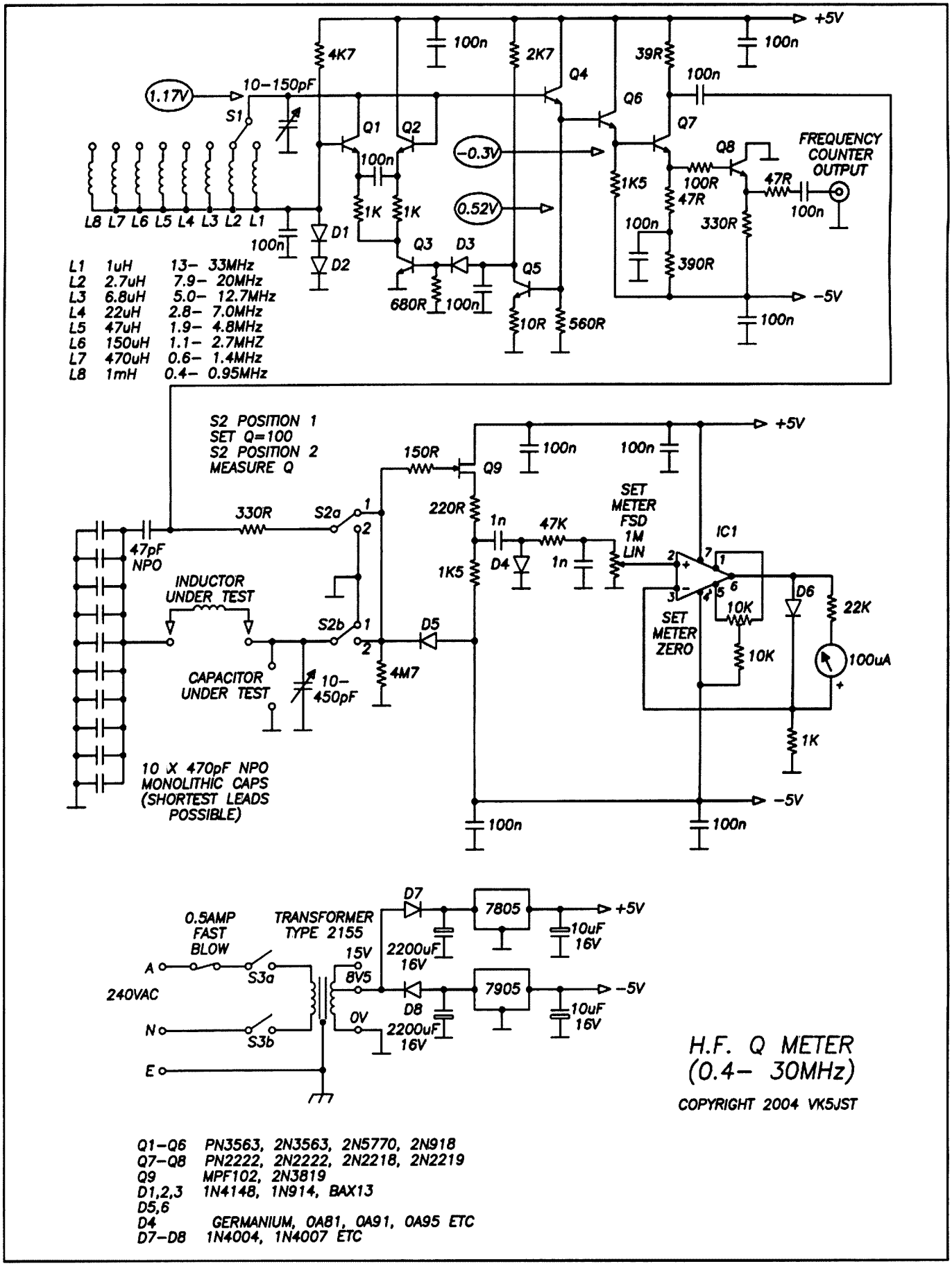


Fig 2 – Circuit diagram of the Q Meter.

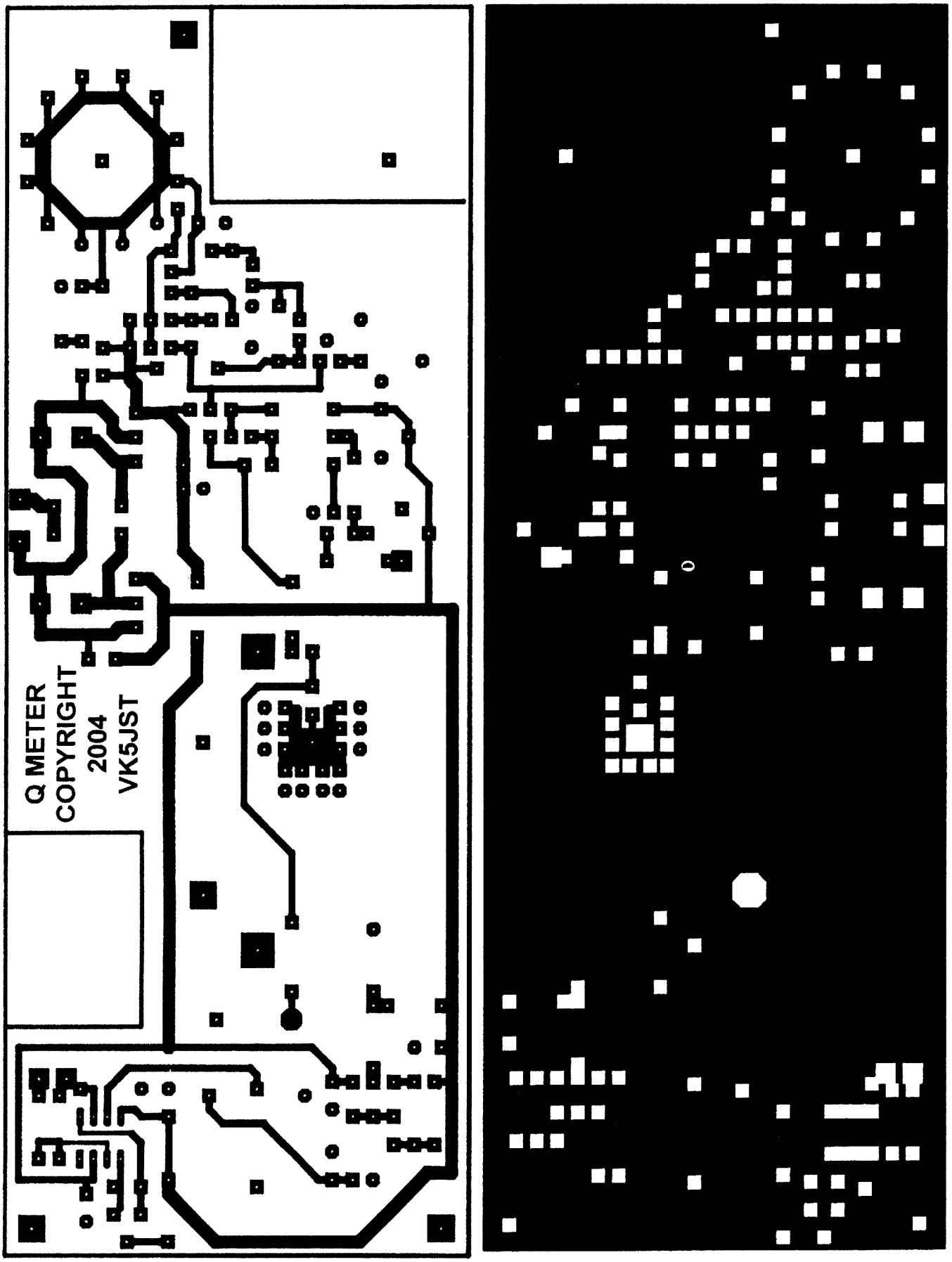


Fig 3 – Artwork for the circuit board.

How it works

The circuit, Fig 2, can be broken down into the three sections previously mentioned:

1. RF signal generator
2. test circuit
3. high impedance AC voltmeter.

The RF signal generator consists of a wide range RF oscillator with AGG and buffering to provide a near zero output impedance to drive the test circuit. To the best of the author's knowledge this circuit is original and was probably patentable before publication. It is one of those rare designs which provide a clean, constant amplitude sine wave output over an enormous frequency range using bog standard devices, and is an ideal oscillator to power things such as aerial bridges, signal generators and other bits of test gear. It will work from audio frequencies to well over 100 MHz. In this design, off the shelf inductors (advertised by DSE, Jaycar and others as RF chokes) are used to provide continuous coverage from 400 kHz to 30 MHz. It is a wide band power circuit, and to avoid unwanted dips in the output amplitude, must be carefully laid out using short leads over a ground plane. Careful RF bypassing is also necessary. Of particular importance, the inductors L1 to L8 should be carefully separated so that stray capacity coupling does not cause interaction. Under no circumstances make up the values specified with a long chain of series inductors, as this is really asking for trouble at higher frequencies.

The circuit operates as follows: the oscillator itself is made from an emitter coupled differential pair (Q1 and Q2) coupled in circular fashion (base to collector: emitter to emitter) to provide wide band power gain. The frequency of oscillation is determined by a parallel tuned circuit in the collector of Q1, which causes the gain of this transistor pair to be maximum at a single frequency. Unlike most oscillators which start in class A but run in class C, these two transistors run in class A under steady state conditions, due to AGC action. As the operating frequency is changed with the variable capacitor, the dynamic impedance of the tuned circuit also varies, requiring the amplifier gain to be varied if a constant amplitude sinusoidal output voltage is to be obtained. The power gain of Q1 and Q2 is simply determined by the current flow through them, which is maximum at startup when the amplitude of oscillation is zero, Q5 is off and Q3 is thus saturated with a collector potential very close to ground (10-50 mV). As the amplitude of oscillation builds, the positive half cycles appearing at the base of Q5 cause it to draw collector current, reducing the potential at the base of Q3 which in turn reduces the current flow through Q1 and Q2. Note that under no signal (starting) conditions, Q5 is biased to the edge of cutoff with 0.4 V on its base, but that under running conditions it has a voltage

gain of around 270 (2700/10) ensuring very good AGC action. The AGC action may be watched by measuring the DC drop across either of the 1k emitter resistors of Q1 and Q2 with a DVM. As the frequency is varied from 0.4 to 30 MHz, the DC drop will vary from a few millivolts to several hundred millivolts depending on frequency and tuned circuit Q.

The circuit is not working correctly if the AC signal amplitude at the collector of Q1 is greater than about 850 mV p-p. At amplitudes larger than this, there is a risk that Q1 will saturate, AGC action cease and a non-sinusoidal output occur. If the circuit is working correctly, around 650-750mV p-p should appear at the emitter of Q4. Typical DC voltages around the circuit with a very short length of wire between Q1 collector and base (5mm max) and hence no oscillation are:

Q1 base and collector, Q2 base, Q4 base 1.17 V

Q1, Q2 and Q4 emitters 0.43 V

Q5 base and emitter 0 V

Q5 collector 1.31 V

Q3 collector 15 mV

All these figures are at normal temperature and a supply voltage of 5.00 V. Note that the circuit will work correctly from 4.0 to 6.5 volts without modification.

The sine wave appearing at the emitter of Q4 is buffered by emitter follower Q6 which in turn drives a wideband power amp Q7. This stage has a bandwidth of around 70 MHz and drives the test circuit. It also drives Q8 providing an output for a frequency counter and/or for use as a 50 ohm signal source. The driving voltage E for the test circuit of around 7 mV p-p is provided by a 100:1 capacitive divider consisting of 47 pF and 4700 pF, derived from Q7 collector. This provides a source with very low internal impedance relative to the test circuit impedances. Note that the top of the divider chain has a voltage 100 times greater than the output and so can be used to calibrate the meter for Q = 100.

The usual approach for obtaining a driving voltage with a low internal impedance is to follow the generator with a resistive divider having an output resistance of around 0.02 ohm. This resistance is negligibly small in comparison to the losses in most tuned circuits. However this technique is only possible if you are a manufacturer and can have special non-inductive resistors made with zero lead lengths. Standard resistors cannot be used for this application because even very short connecting leads will introduce impedances which are far larger than 0.02 ohm at 30 MHz and all calibration will be lost. The use of monolithic capacitors is a far better approach but has only recently become possible because super miniature monolithics are now being made in sizes of up to 820 pF with NPO dielectrics (Jaycar, DSE). Unlike the high K dielectrics previously used, these capacitors have zero temperature co-efficient allowing a stable temperature-independent capacitive divider to be constructed. Provided the leads are kept very short on these capacitors, they remain very 'pure' components at 30 MHz and unlike resistors do not introduce losses into the tuned circuit. Moral - keep the leads on the 470 pFs near zero length.

The test circuit is the next item for examination. Keep all the leads around it short and direct so that you really measure the inductor being tested, not the test circuit. The printed circuit board has been drafted so that any good quality miniature air variable capacitor can be mounted (no mounting holes – just a general area). Do not use the miniature transistor radio variable capacitors on sale with plastic insulation between the plates. The best quality capacitors will have a good electrical friction contact between the shaft and frame next to the PCB, and hopefully one at each end of the shaft. Use the best you can get your hands on for the test circuit. The oscillator is much less critical of component quality. Professional air variable capacitors have silver plated brass plates and a very good electrical connection between shaft and frame, and are ideal for making a really first class instrument. You do not have to use either of the variable capacitor values specified which are only published as a guide.

Last we have the AC voltmeter. A source follower Q9 with lots of extra features to stop it oscillating provides a 4.7 Mohm input impedance and drives a half wave rectifier D4. The resultant DC output is applied to a meter via a pot which allows a Q of 100 to be set to any convenient point on the meter scale (e.g. to 20% of FSD giving Q =500 at

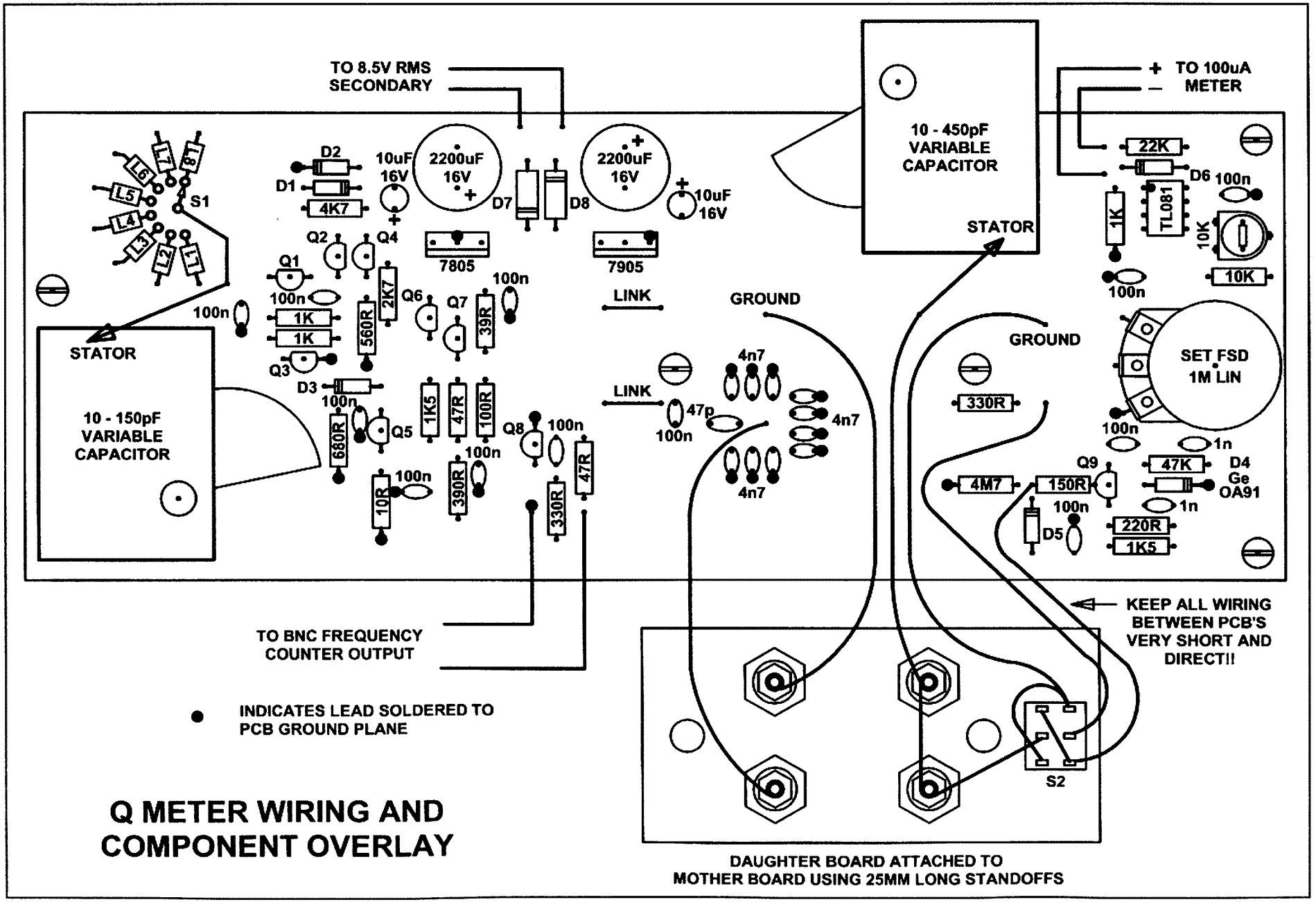


Fig 4 – Main circuit board component overlay.

FSD). The meter zero is set using a 10 K trimpot which cancels the effects of the amplifier dc input offset voltage.

Calibration

Calibration of the instrument is very simple. No calibration of the RF oscillator is provided as these days frequency counters appear in most amateur shacks and are very much more accurate than dial scales. The precision tuning capacitor in the test circuit is calibrated using a DVM on its 4 nF (4000 pF) range connected to the inductor terminals. In this way the effect of the 4700 pF driving capacitor is included in the calibration. S2 should be switched to the MEASURE Q position. Before starting calibration, adjust the SET METER FSD pot. so that the amplifier input is zero. Also make sure that the square wave applied by the DVM to the test circuit isn't so large that D5 (the FET protection diode) is forced to operate These precautions will prevent 'meter bashing' and inaccurate dial scales.

Using the instrument

To use a Q meter is simplicity itself. You simply plug in the coil you are designing/testing and adjust frequency and system capacitance until the meter peaks. You don't even need to calculate the inductance. All you need to know is that the coil works successfully at say 14 MHz exhibiting low losses with the value of resonating capacitor you picked. You adjust turns and coil size/ shape until this occurs - what could be easier? To measure small capacitors, you use a known inductance which will resonate at the frequency you want to use with the tuning capacitor set to near maximum value. You then add the unknown capacitor in parallel with the tuning capacitor, and without adjusting the frequency, back off the tuning capacitor until resonance occurs again. The difference between the two tuning capacitor values is the value of the unknown. Unfortunately there is no room in an article such as this to cover more than the basic uses, but you can do all manner of RF measurements if you are sufficiently devious, including transmission line measurements - read the literature and you will be staggered at how flexible a Q meter is.

ar

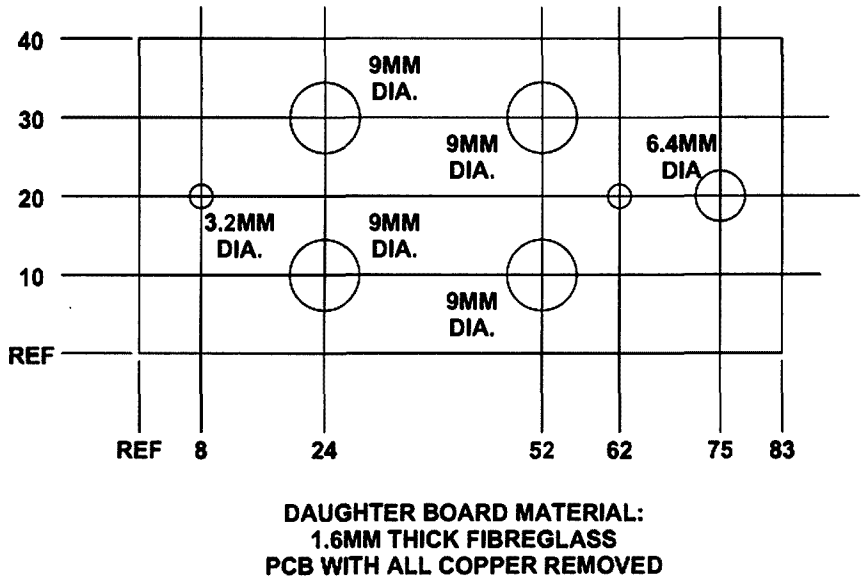
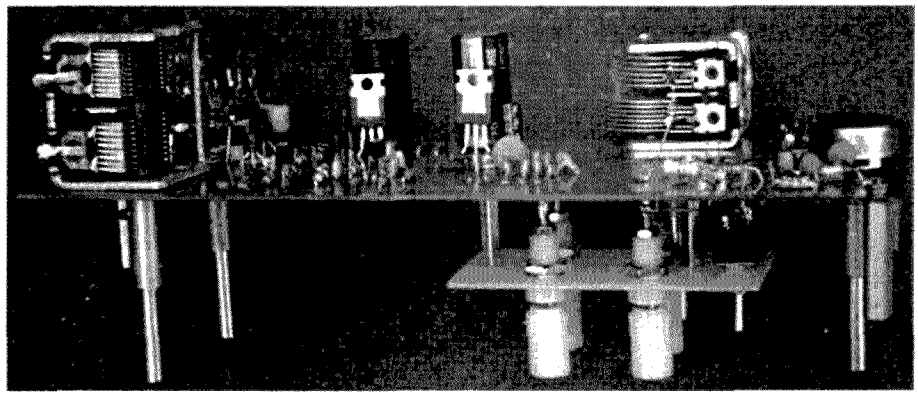


Fig 5 – Daughter board details.



WIA Comment *continued*

and ensuring better consultation between the WIA and its Advisory Committees.

The Foundation Licence will be one of the great challenges of 2005. Will it attract new amateurs? Will the clubs make it attractive? Will we as existing amateurs welcome the newcomers? Will the new licensees seek to move to a higher qualification? Will they support the clubs? Will they support the WIA?

It is obvious, I think, that many people who spend so much time working for amateur radio and the WIA believe that we can meet those challenges. Otherwise why would they bother?

Can we make the WIA something that every amateur will want to support?

I know that when the WIA adopted its new Constitution and became a single, national body so that all amateurs could become direct members, there were some people who said that they would wait and see how the "new" WIA performed before they would become a member.

Perhaps the WIA has, in the last 6 months, changed sufficiently and done sufficient to be able to say to those who decided to "wait and see" that they should now consider becoming a member.

Can you, as a member, say that to someone who is not a member?

I hope so.

And I hope that you do.

ar

A compact, effective vertical antenna for 160 metres

Part 2 – *Construction*

Drew Diamond VK3XU

Radiator

The vertical component is a 6 to 6.5 m length of ordinary 32 mm ($1^1/_4$") aluminium tube. See Figure 8.

Genuine all stainless-steel 17 ~ 38 mm hose-clamps are ideal for attaching the various components to the aluminium tube. Solder lugs, made from zinc-plated sheet, are suggested for making the electrical wire connections to the aluminium tube. Aluminium, zinc and stainless steel are fairly compatible, so severe electrolysis should not be a problem. However, to prevent corrosion, it is good practice to use jointing compound or grease between components to exclude moisture. Do not put plain copper and another material together directly.

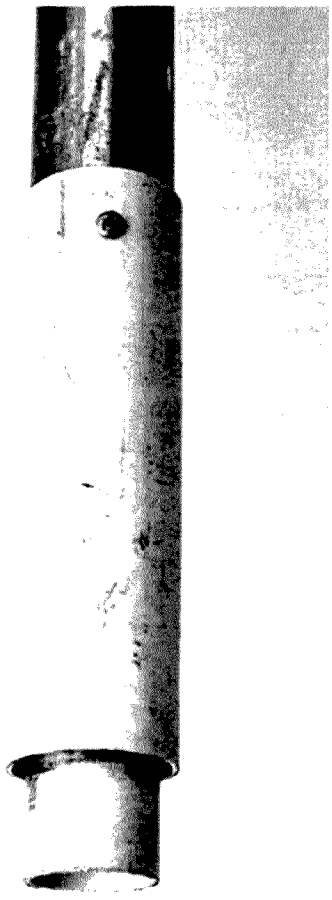


Photo 2 – Base insulator.

Insulators

For the base insulator, a 200 mm length of "20 mm" PVC pipe (actually 27 mm od - very confusing) is fitted inside the base of the 32 mm aluminium tube. External to the aluminium tube is fitted a 180 mm length of "25 mm" PVC pressure pipe (actually 32 mm od). They may be riveted or screwed together, as illustrated in Photo 2.

The base insulator rests in a 27 mm hole in an aluminium base-plate, which is made to fit across the peaks of the decking roof, and held there with two small G-clamps, as pictured in Photo 3. Note the right-angle aluminium bracket for the coax connector.

The top insulator is a 300 mm length of "25 mm" PVC pipe, inside which the main aluminium tube, and a 180 mm length aluminium top section tube are inserted, as shown in Photo 4. They should be riveted or screwed as for the base insulator. My experience of so-called "25 mm" PVC pipe is that some brands are a little smaller than 32 mm od. If this is the case for you, the PVC pipe may be persuaded to expand onto your aluminium tube by dipping the PVC into boiling water, then carefully and repeatedly working the PVC pipe onto the aluminium tube. File a bevel onto the opening of your 180 mm aluminium top tube for use as work-piece for the job.

Coil

The 118 microhenry loading coil is composed of 65 turns of #13 B&S/15 SWG (1.9 mm) enamelled copper wire space-wound upon a 280 mm length of

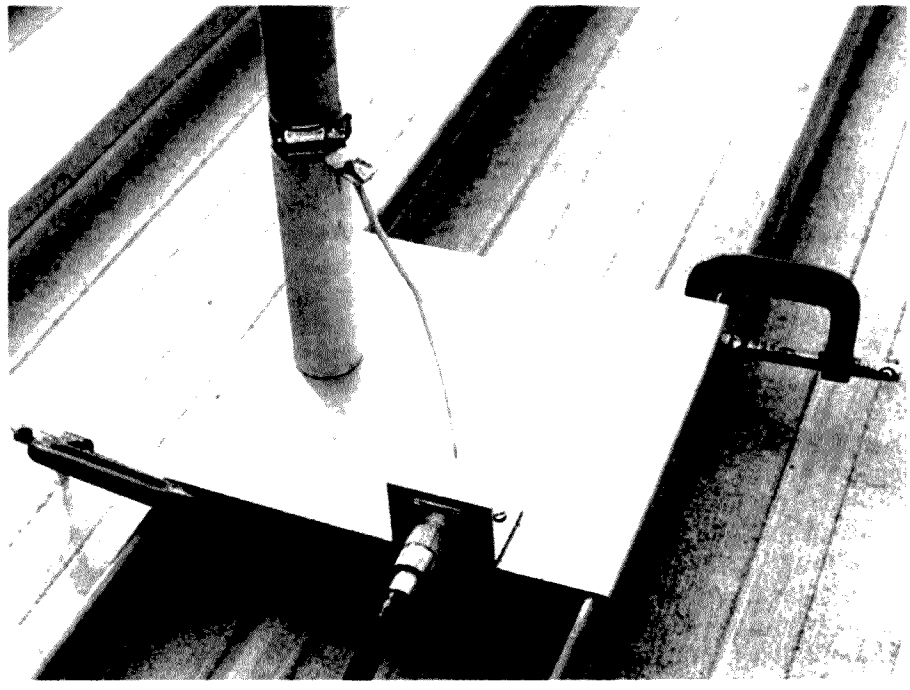


Photo 3 – Base assembly.

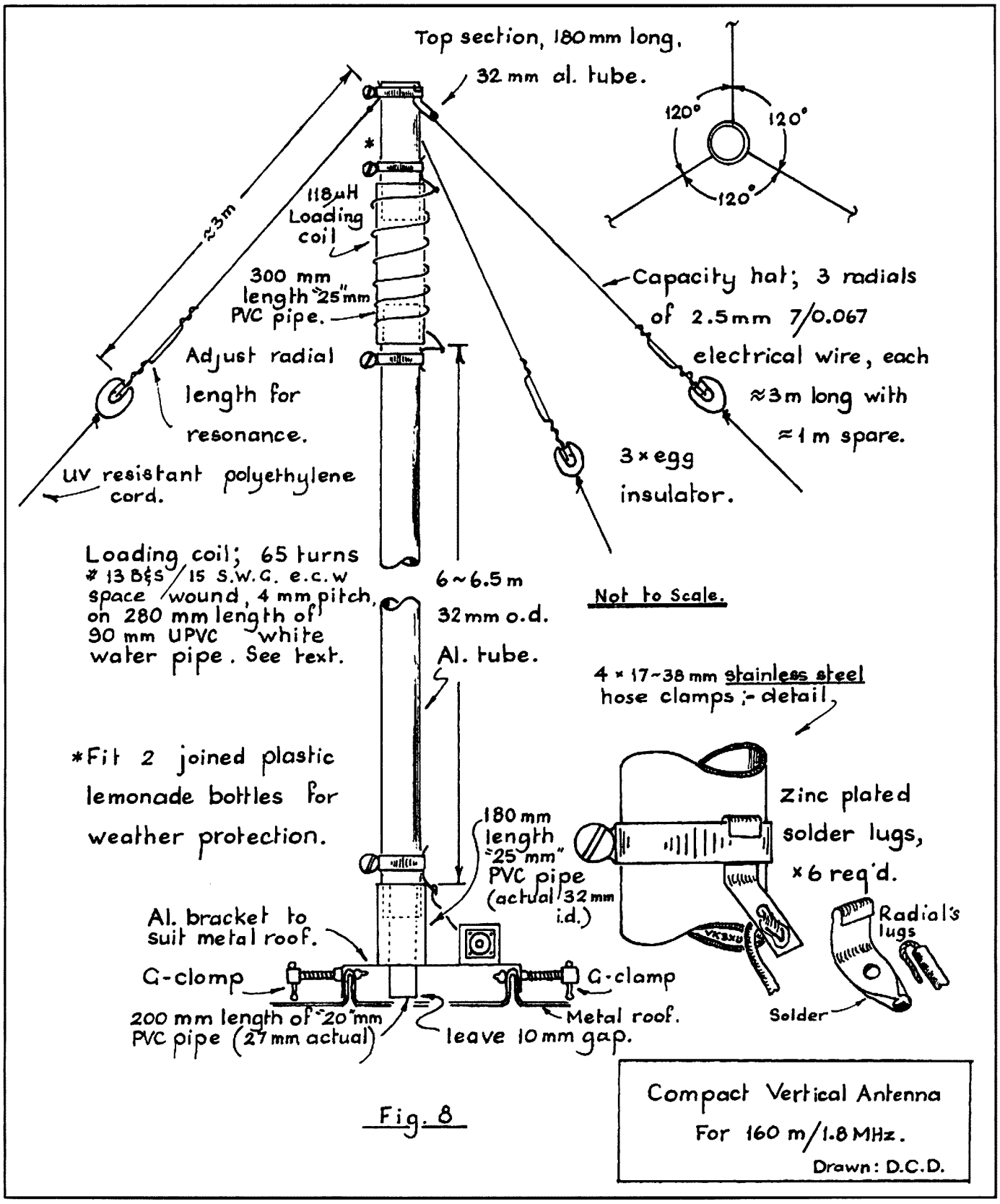


Fig. 8

Fig 8 – Construction details of the compact, effective vertical antenna for 160 metres

white (not grey) 90 mm od UPVC water pipe as a former. To aid in getting the spacing even, mark a line down the length of the pipe, then mark off 65 lines spaced 4 mm upon the longitudinal (which leaves 10 mm at each end). Hint: find an object, such as a drill shank, a tad smaller than 4 mm for use as a gauge to mark off each line. Using a triangular file, carefully form a notch at each of the 65 lines, as illustrated in Photo 5. Drill a 2 mm hole leading into the first notch, and another leading out of the last notch for the wire to enter and exit the pipe former (Photo 6).

You will need about 20 m of wire. Fix the wire end (or spool) in a vice, then run the wire out to its full length. Remember to pocket your long-nose and bull-nose pliers and cutters. Using bull-nose pliers, give the wire a firm pull to take out any small wrinkles. The wire should stretch about 100 mm in the process. Poke the wire end through the hole leaving a tail of about 200 mm, then put a bend in the wire so that it cannot slip out. Whilst keeping the wire taut, walk towards the vice, maintaining a good tension all the while. Make sure that each turn registers into each slot. Don't worry about any small wanderings - they can be straightened up when the coil is fully wound.

With the 65 turns applied, grip the coil firmly so that it cannot uncoil and cut the wire, leaving about 200 mm for the tail. Poke the wire through the hole, then grip the free end with pliers and firmly pull the wire whilst pressing that last wrinkle down through the hole with your thumb. Immediately put a bend in the wire to secure it.

Straighten out any small variations between turns so that they are evenly spaced. Apply a bead of hot-melt or epoxy glue along two or three longitudes of the winding.

A 90 mm end-cap is glued on to the top of the coil former, which allows the coil to rest upon the top insulator and thus take the strain off the coil's wire connections. The cap must have a 32 mm hole in the middle, and a 2 mm hole near the perimeter for the coil's top wire to exit. My completed coil is shown in Photo 7.

It was found that rain-water upon the coil does not appear to cause serious degradation. However, to avoid corrosion, and reduce the need for substantial re-match after rain, it would be prudent to protect the coil from the weather.

Photo 8 shows my coil, over which modified two litre plastic lemonade bottles have been fitted. The neck has been removed from one, where the remaining opening has been enlarged to just a smidgen under 32 mm. The second bottle has had its top and bottom removed. The resulting cylinder is fitted inside the first, then a bead of silicone sealant has been run around the join. The bottom should remain open to permit ventilation. The assembly is pushed onto the top section and siliconed just prior to the top radials being fitted.

Capacity Hat

The three capacity hat radials are (initially) 4 m lengths of 7/067 electrical wire soldered to three zinc plated lugs, which are slid well under the top hose clamp at about 120 degree intervals, then bent over as shown in the drawing detail and Photo 8. To provide some strain relief, the solder lugs should be wrapped around the wire (using bull-nose pliers). Use UV resistant polyethylene cord (usually black) as the guy ropes, which may be tied to convenient, or purpose-made, points on or about the roof line.

Egg insulators provide a handy thimble for the radial wire but, more importantly, it was found that the black cord becomes slightly conductive when wet - hence the insulators.

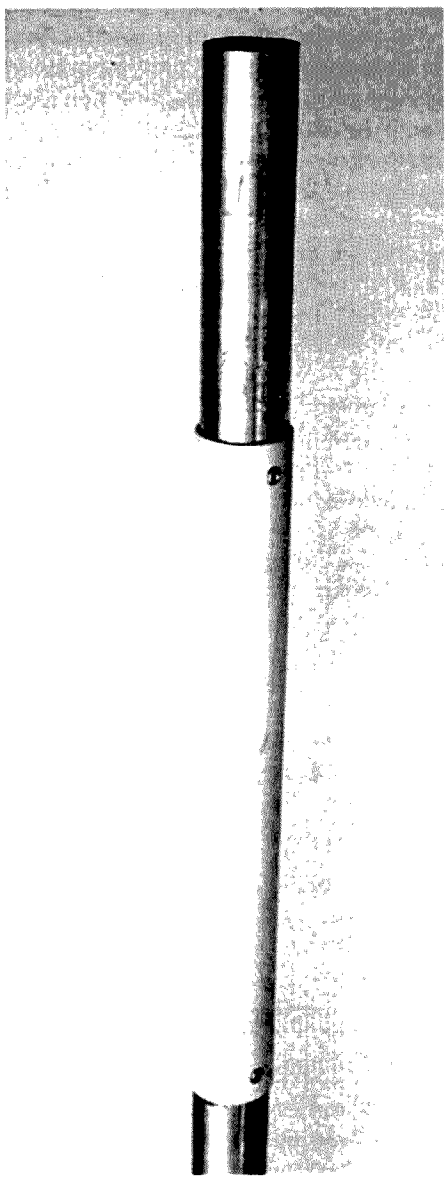


Photo 4 – Top insulator.

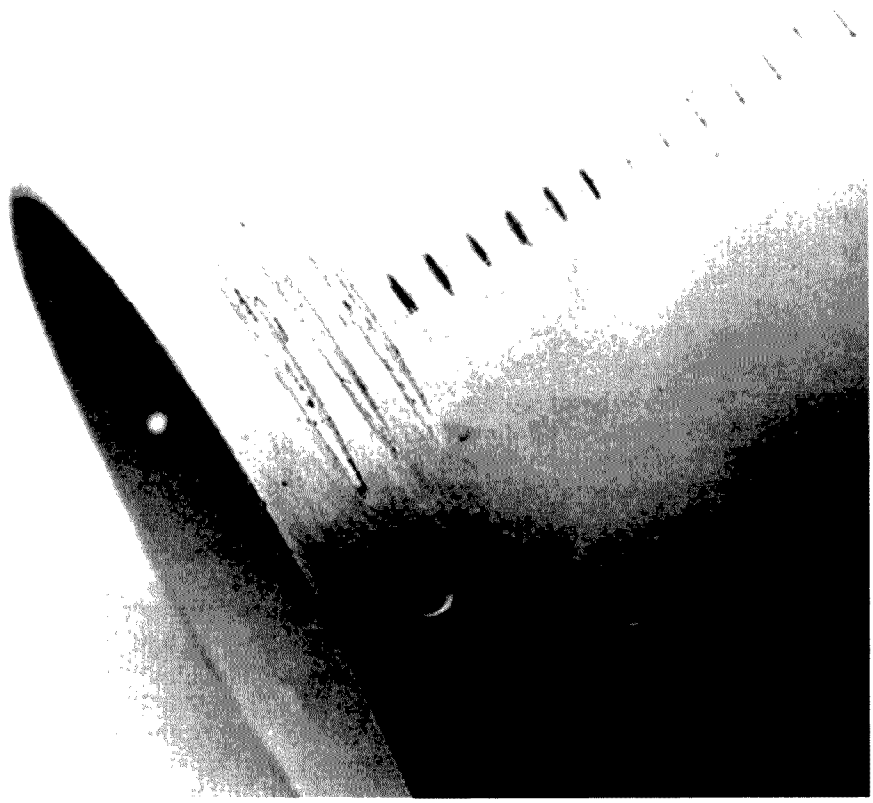


Photo 5 – First three of 65 notches.

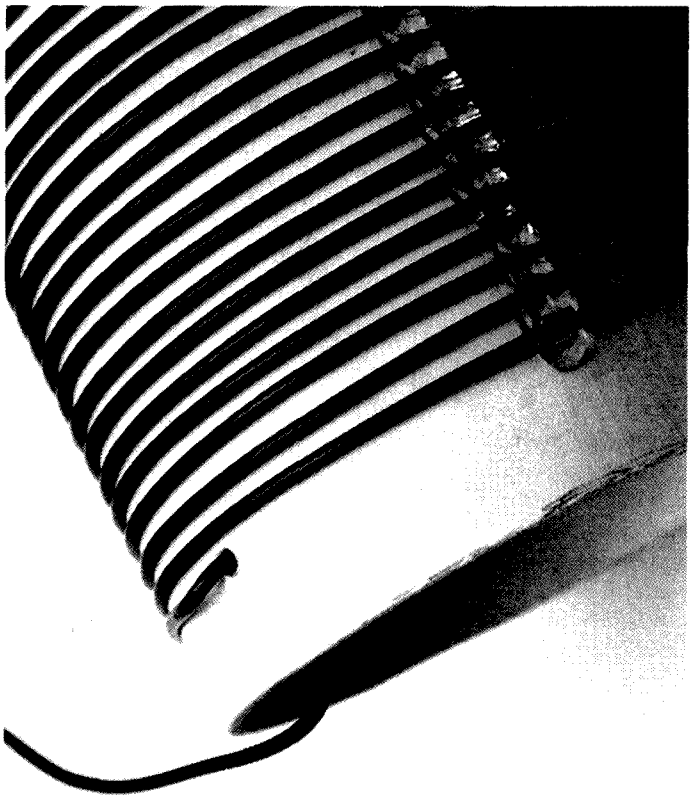


Photo 6 – Coil detail..

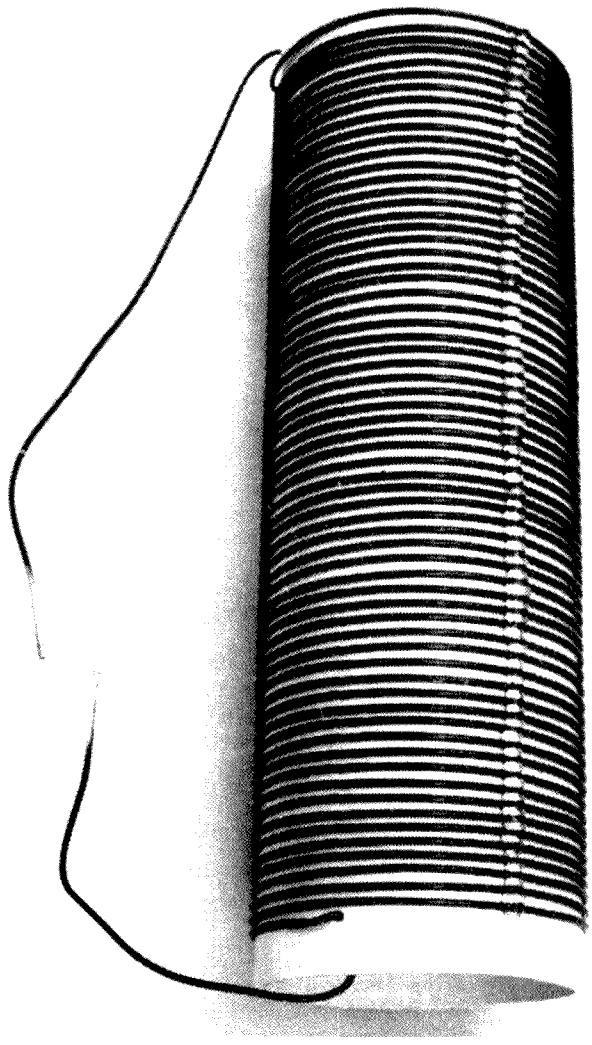


Photo 7 – Complete coil

Commissioning

Erection is a two-person job - one to push the antenna up, then hold it vertical, while the other clambers around and ties off the guy ropes.

If you have an antenna analyser, then you will know what to do. Or the antenna may be resonated using a dip meter. To improve frequency accuracy, it is a good plan to have a receiver operating near the middle of the band (say 1840 kHz), either a portable battery set near the base of the antenna, or the main station receiver within hearing range (BFO on).

Solder a 2-turn wire link, slightly larger diameter than your dipper's coil, to a PL-259 plug, which is inserted into the base connector. Place the dipper's coil near, or inside the link coil, then sweep the dipper around 1.8 MHz. You will find that the antenna radiates the dipper's signal very effectively. Look for a dip. It will probably be rather shallow and broad, so observe the dipper's meter very closely.

If the resonant frequency is too low, shorten each top radial by the same amount. Try about 300 mm at first to get a "feel" for the procedure. Lengthen the radials to lower the frequency. Hopefully, you won't have to repeat the performance too many times. Remember, the ATU/coupler is going to be in the shack, so the resonant frequency has only to be somewhere near the middle of the band.

To reduce the intensity of the E-field inside the building (in my case, by -17 dB on the near-field), and provide some lightning protection, the roof should be effectively grounded. Fortuitously, for the prototype it was possible to connect the roof to one of the metal uprights of a nearby carport, using a length of "hoop-iron" for the job.

Coupler

Impedance at the base of the radiator is about 20 ohms resistive at resonance, which represents an SWR of 2.5. At 1.8 MHz, any loss due to this mismatch will be very small in good quality coax (eg RG-8) less than $^1/_8{}^{th}$ wavelength long (about 20 m). The necessary ATU/coupler may be any of the "transmatch" or "T-match" configurations (the usual circuit used in recent commercial ATUs).

Rather than tie up your HF ATU/coupler, however, it is suggested that a purpose-built unit be used. Depending upon the impedance seen at the transmitter end of the line, it may be purely resistive, or resistive with a capacitive or inductive reactance. Theoretically, a coil and capacitor L-network should do the job of matching. It is found that at some point in the band, the necessary arrangement swaps from needing to be C on the transmitter side, L in series, to C on the line side, L in series.

The solution, of course, is to use a pi-coupler, consisting of two, 2-gang broadcast capacitors and a tapped 13 microhenry series coil. Provision is made for connection of extra fixed mica capacitor(s), up to about 1500 pF, across

either variable capacitor to permit an efficient match to be made between the transmitter's output, and the line input.

Parts

Aluminium tube, 32 mm od ($1^1/_4$") is available in 6.5 m lengths from Caplan (Alcan). Melbournians may be interested to know that Challenge Metals (recyclers, phone 1300 653 625) have (at writing) 6 m lengths of 32 mm aluminium tube for about $9 per length. The PVC components were purchased from Bunnings, who supply PVC pipes in various short lengths of various sizes. Stainless steel hose clamps may be obtained from auto parts suppliers. For enamelled copper wire suppliers, look up "magnet winding wire" or "transformers" in your local Yellow Pages phone directory.

Conclusion

Urban amateurs may be prevented from exploring our 1.8 MHz band by the perceived difficulty of erecting an effective antenna in restricted circumstances.

A vertical antenna is the most accepted all-rounder for 1.8 MHz work. Where a reasonably-sized conductor, such as a metal roof, is available for use as a "ground-plane", it has been practically demonstrated that a fairly compact, loaded vertical antenna, made from procurable materials, is capable of providing very acceptable performance, both for local and long-distance work.

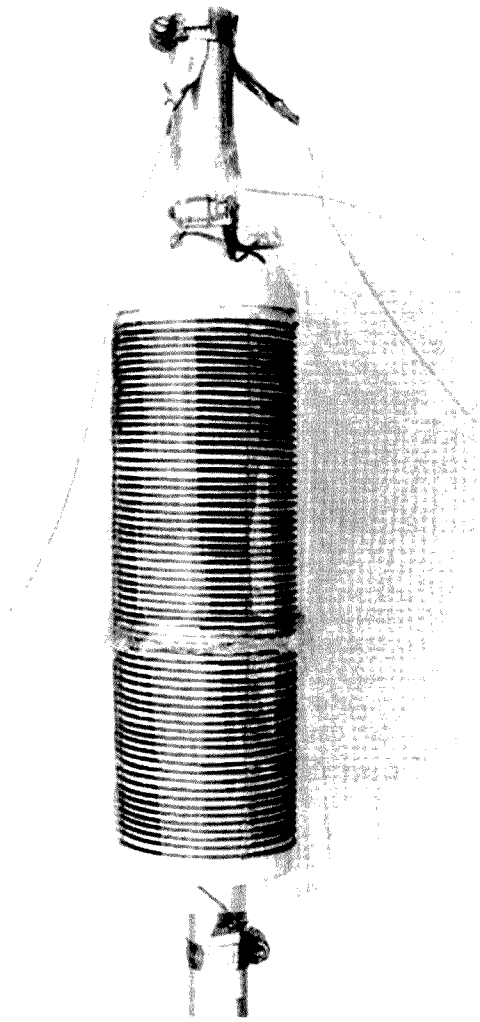


Photo 8 – Loading coil with radials connected at top.

Acknowledgment

My thanks to the friendly 160 metre gang, particularly the "Coffee-break" (11 am Monday - Saturday, 1843 kHz AM) fraternity, for their comparison reports, helpful suggestions and technical advice

ar

Silent key

I.D. McNabb (Sandy) VK3AMN

13-05-1919 – 16-07-2004, 85 years

Sandy was born in Caulfield (Victoria), but spent his early school years in Branxholme (Western District). His first interest in radio was a crystal radio built from a kit. He passed his exam for a full call licence VK3AMN on 6th April 1949. From then on there was no stopping him, he was always building or constructing some type of "home brew" transceiver or antenna. My early memories are of hearing the CQ, CQ DX calls coming from the radio room at the end of the corridor in Windsor and later his shack in Boronia. In 1956 Sandy built a TV receiver using an article in an amateur radio magazine as a guide. We were the most popular people in the street with lots of visitors to watch TV. In 1957 Sandy was proud to move into his own QTH in Boronia with his young family, XYL Jean, and children John, Ed, Elizabeth and Jim. Here he built a garage with the sole purpose of having a Radio Shack and workshop separate from the house. His first antenna tower was built from a ladder going straight up into the sky, using guy wires tied to the fences and trees. On top of this was a cubical quad made using bamboo canes for spreaders. (This was for 20 m, 15 m, and 10 m). The rotator was made from the diff of a Ford 10 Prefect and an aircraft flap motor. In 1989 Mum and I bought him a 2nd hand Nally tower for his birthday, he put a TH3 junior with other commercial antennas on it. He was often fiddling or changing the antennas to get them just right, often with the help of family or friends.

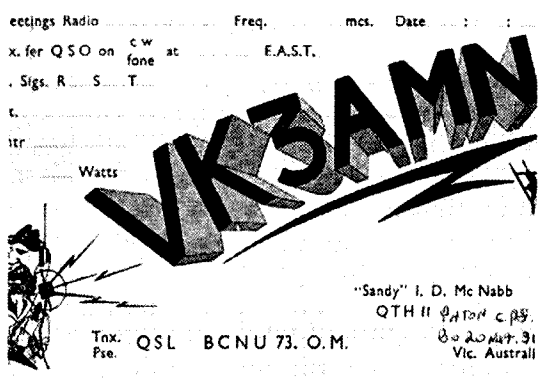
Over the years Sandy enjoyed many forms of amateur radio including fox hunting, going mobile or being portable when on holidays. This was before the days of mobile phones when you could talk to many people on the radio when out and about in the car. Sandy loved to buy new rigs and was interested in all the latest gear even getting involved in amateur satellites, RTTY, Packet and PSK31.

After the death of his beloved XYL Jean in 1991 Sandy started to import his gear into the house, first onto the lounge table and then into the spare room which became the radio/computer room. This was so he could keep in touch with his mates without having to venture outside in the hot/cold/wet weather.

Sandy's idea of open house was to have anyone with an interest in amateur radio into his shack to discuss the many ideas of communications. This included having scouts for Jamboree of the Air for many years. There were also many occasions when Hams from overseas or just up from the country would call in to visit. Sandy even managed a return visit to some friends from Japan.

Sandy was slowing down a bit in later years, but still tried to keep up with his radio and computer until he lost the battle after a short illness.

Elizabeth McNabb (his daughter)



Opinion

A proposal for reforming amateur examination processes

Ian Jackson VK3BUF

This document relates to the examination process for Amateur Radio operators. The need for change has been pressed upon the amateurs whether they want it or not. Simply making the minimal administrative changes to conform with new legislation would limit the uptake of the hobby to a straggling few and reinforce the downward spiral. To seize the initiative and establish a publicly accessible system is to spearhead a new era of amateur radio for all Australians. Let us not allow this opportunity to pass us by.

This article is a condensed version of a more complete proposal put forth by myself and others over several years. To request the full version contact: ianjackson@dcsi.net.au

The existing system:

The present system for Amateur examinations has not changed for many years. Interested persons must contact and apply to a certified coordinator within Club or Zone groups.

Conducted by volunteers, exams are usually staged at infrequent 1 to 2 month intervals. Add to this a 30 day (typical) delay while papers are being marked. (longer over Christmas). The ACA then takes 14-21 days to process a licence application.

Candidates must typically wait 56 to 100 days before they can get on air if they are successful. Unsuccessful candidates may have to repeat this cycle several times before all subjects are passed.

Notwithstanding the difficulty of the exam, the actual exam process is the biggest disincentive we have for people contemplating an Amateur Radio Licence.

A major change in the examination process is needed, and it should happen in conjunction with the other proposed licence changes presently being considered.

The proposal:

- We retain or expand our present list of examiners with the various clubs and divisions.
- An Internet site is established with a range of on-line exams for both theory and regulations. These would be real exams, but they can only be engaged and conducted by the authorised examiners.
- The examiners confirm all identities and help conduct the on-line exam. A Pass/Fail result would appear on the screen at the end of the exam.
- If they fail, the attempt is logged with the site and the candidate can try again at the examiner's convenience. The next day or week – whatever.
- If they pass, they select a vacant callsign and a temporary licence is printed. The candidate then leaves an ACA licence fee with the examiners and goes home with a valid callsign.
- The examiners forward the application to the WIA National office, who retain a fee, confirm all identities and forward applications to the ACA who send a formal certificate & licence to the candidate in the normal fashion. The ACA would almost certainly prefer to receive these licence applications as a block from a single source rather than intermittent correspondence they receive now from around the country.

With such a system the workload in the W.I.A National office is greatly reduced. This will make a big difference to the number of exams being held, for less workload. Even when candidates fail, they would know immediately, which would reduce stress and tension.

Over many years I have seen the process itself infuriate genuine would-be amateurs to the point that they have walked away from the hobby, never to return.

Combined NAOCP/ AOCP (Standard/ Advanced) examinations

The Novice and Full theory examinations have always been separate exams. This may have been appropriate in earlier days when novices had no access to advanced modes. With the inclusion of extra facilities for Novices has come an expansion of the syllabus. They are similar in content to the 'Full' exam and differ only in the degree of difficulty.

The existing Novice syllabus should be abandoned, as all of its content is already encompassed by the present AOCP syllabus. The NAOCP theory standard will soon become the new 'STANDARD' licensing option, and the existing AOCP or 'Full' licence will become the 'ADVANCED' licence.

Maintaining these two question banks as separate entities is unnecessary. Exam integrity could be preserved by allowing the STANDARD / ADVANCED candidates to sit the same exam. The result would be determined by the pass mark obtained on the day.

- A 70% or greater exam mark would result in a pass to the ADVANCED licence.
- A mark of (say) 50% to 70% would result in a pass to the STANDARD licence.

Candidates would no longer have to decide which licence level to initially apply for. This has been a real dilemma for people new to the hobby. Much time has been wasted by candidates who may well have been up to the Novice standard, have instead attempted the AOCP standard and have failed. The result is that they have nothing. They then may have to wait for several months before having to make the same decision yet again.

Foundation licence examinations

The new entry level or 'Foundation Licence' as it is now known, will be implemented in the near future. The standard chosen should resemble that of the European counterpart rather than creating another 'standard' from scratch. This will have important ramifications for CEPT equivalence between nations.

Persons wishing to gain a Foundation Licence would require a pass with a mostly multi-choice exam. Because it is largely operator oriented, this would best be different and more interactive than the STANDARD/ADVANCED examination. It would be strongly oriented towards setting up a successful amateur station in a 'safe' way with low interference potential.

The Foundation Licence exam should also be Internet (or CD Rom) based. It would require the candidate to complete several tasks, such as dragging pictures of transmitters, antenna tuners and test equipment into a 'work area' and correctly interconnecting the ingredients of filters and earthing requirements. Only when the candidate has completed all assigned tasks correctly within an allocated time frame would they be deemed to have 'passed'. Other questions would require a more general knowledge of basic RF and Electrical topics akin to that present in the UK Foundation Licence syllabus.

The exam question bank

With our present system we have a large question bank which forms the source of exam papers. This is a closed bank and candidates and educators alike have no access to it.

Over many years I have assisted many students through radio club based classes. I have seen first hand what motivates potential amateurs and I have seen what makes them walk away.

There are three important issues that must be addressed in conjunction with any proposed examination system:

1. Bank access

As the exam question bank is presently sealed, it is extremely difficult to give candidates a true view of what they will encounter in an exam situation. The degree of difficulty of many trial papers presently in circulation is greatly misleading, as are most old reference books. Numerous unreasonable questions have crept into the question bank and instructors, prohibited from viewing exam papers, have increased difficulty in preparing their students.

It is important that this information be made available to both students and instructors. This should not be seen as a quest to reduce technical competency, but as a valid educational aid.

2. Relevance of questions

I have often been asked about the relevance of questions encountered in exams, such as: "Why must amateur operators be examined on things like geo-stationary satellites and the rotational speed of the sun?" I have never been able to provide a reasonable answer to such questions.

It is not simply a question of standards or degree of difficulty. It is the appropriateness of empowering prospective amateurs with the essential skills and safety standards. At some point there must be acceptance that a new amateur need not know everything about everything, it should suffice that they know how to find out. (Compare the present syllabus size with one of 30-40 years ago!)

Educators who have no access to actual exam papers have no way of resolving the intent of many questions encountered by candidates. It is essential to candidates and educators alike that the question bank of any amateur exam be placed in the public domain.

3. Examination consistency

This is a slippery topic to address. In reality some exam papers are harder than others by a good 15 to 20% margin.

It is a condition that has both infuriated and alienated more prospective amateurs than any other.

After exam events I usually ask candidate groups how they have found their paper. There is always a consensus that a number of questions are 'easy' and some are 'hard' or 'tricky'. A bad paper is one that has a disproportionate number of 'hard' questions. Naturally this is a subjective response tied to the material most or least studied by the candidate, but beyond their knowledge is an arbitrary degree of difficulty that swings randomly with the chosen questions.

What can be done?

One strategy is to allow poor questions to be altered or removed from the question bank. (detailed below) This would minimise the silly and obscure questions that are habitually encountered.

A second approach affects the question bank more directly. Questions are presently held in categories so that exam papers have the right mix of topics. A relative degree of difficulty could be attributed to each question. If a small panel of people were to read and rate each question in 'degree of difficulty' on a simple 1 to 5 scale, an aggregate of that figure would be stored as a flag against each question. When the computer is called upon to generate an exam from the bank, it must continue to choose questions until the combined difficulty value falls between two predetermined thresholds.

This process sounds more difficult than it is, but it would be a simple function of programming within the exam database. Once implemented, it would go a long way in restoring confidence to potential candidates.

Regulations examinations

It should be possible to incorporate regulations questions within the theory exams. Regulations then become 15-20 questions embedded as another topic and would not then require a separate exam process. This is current practice with amateur exams conducted in the USA and seems to work well.

A forum for question bank changes

Presently it is difficult to challenge any exam question because the very people who train candidates and administer

examinations have no access to its content. While we must take care in maintaining exam integrity, we are collectively ignoring one of our best resources; our nationwide network of radio clubs.

A more consultative process is needed. A suggested way of achieving this is:

- W.I.A. affiliated radio clubs would have the option of putting forward an individual to be available in the nominal role of an Exam Content Consultant.
- Both Clubs and individuals could submit that an exam question is unfit or unreasonable. In doing so, they must offer an alternative wording for the suspect question. In the case of a question being deemed 'irrelevant', the alternative question may simply be a new question from the same general category.
- At intervals of approximately six months, suspect questions would be sent from the National office as a block (by Email) to the Exam Content Consultants who would simply accept or reject the alternative wording. A majority consensus would dictate whether the change is accepted or not.
- The revised questions would then be introduced to the question bank for immediate use.

Such a process would not be difficult to implement. Most clubs would enjoy the opportunity to contribute to a national effort. It would also be seen to be a consultative process.

About the author of this proposal

I have been a licensed operator since 1978. I have been a member of both the Gippsland Gate Radio & Electronics Club and of the W.I.A. throughout that time. I have been the instructor/coordinator of many formal Amateur Radio classes. Aged 43, I presently operate a small electronic engineering business in Drouin West, Victoria.

ar

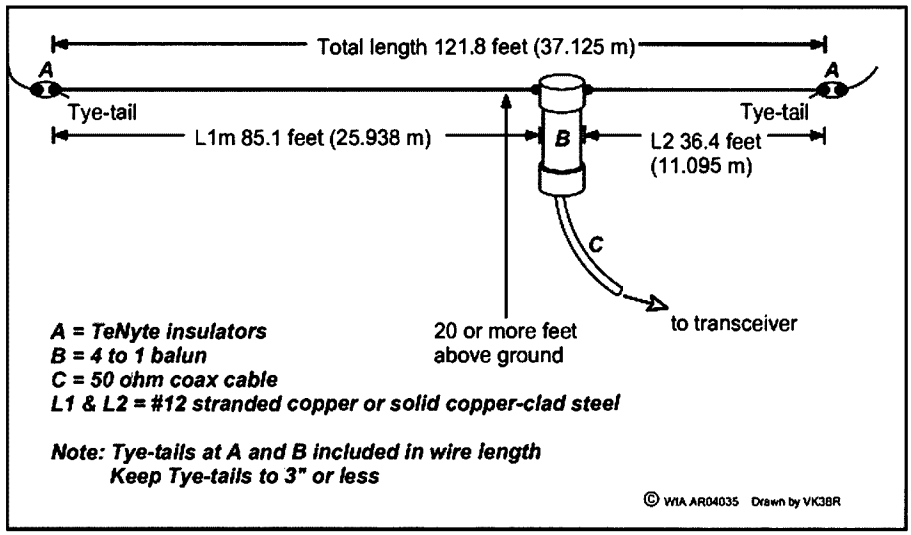
Try this

A Windom antenna

Chris Wright VK2UW

The attached drawing describes a variation on the well-known Windom antenna.

Operating CW and SSB on 80, 40, 20, 15 and 10 metres, I did not use an antenna tuner. On all but 15 metres the VSWR was better (less) than 2 to 1. On most bands, it was less than 1.5 to 1. On the CW portion of 10 metres, the VSWR was slightly above 2 to 1.



600 Hz selective CW audio amplifier

Robert Milne VK7ZAL/AX2TAR

I have developed this amplifier with a bandwidth of 52 Hz at 600 Hz. It is capable of lifting CW out of the noise by over 10 dB. I use it when listening to CW signals on 181.4 kHz from New Zealand.

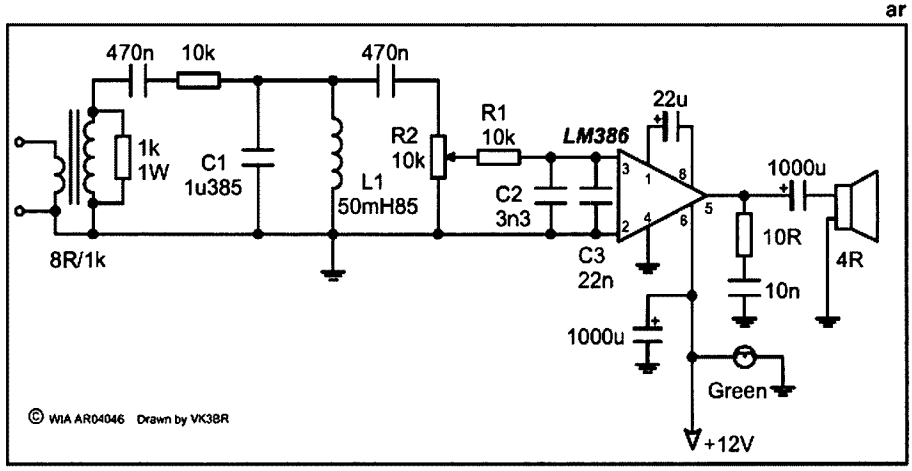
I resonate the antenna, amplify and apply the signal to my FRG100 receiver. This 600 Hz amplifier plugs into the phone jack of the receiver. On the LF band there is usually quite a lot of noise and this filter helps improve the signal to noise ratio.

The parallel tuned circuit of C1 and L1 must tune to the frequency of the tone of the CW coming out of the receiver, in my case 600 Hz. Some additional filtering is provided by R1, C2 and C3 forming an approximately 600 Hz low pass filter.

In my case, L1 consists of two layers of 0.5 mm diameter wire wound on a ferrite core 2.23 inches square and 0.5 inch thick. The inductance value is not critical as long as it resonates with C1 somewhere near 600 Hz. The core of L1 should also be such that the inductance doesn't drift.

The 8 ohm/1 kilohm transformer is a speaker transformer. The volume control R2, is a 10 kilohm potentiometer.

ar



Gridsquare Standings at 24 December 2004

144 MHz Terrestrial

VK2FLR	Mike	111
VK3FMD	Charlie	103
VK2KU	Guy	102
VK2ZAB	Gordon	78 SSB
VK3KAI	Peter	77
VK2KU	Guy	69 SSB
VK3CY	Des	68
VK3PY	Chas	68 SSB
VK2DVZ	Ross	62 SSB
VK2TK	John	62
VK3EK	Rob	62 SSB
VK3HZ	David	62
VK3XLD	David	55 SSB
VK2EI	Neil	54
VK3TMP	Max	53
VK3ZLS	Les	51 SSB
VK3BDL	Mike	50
VK3BJM	Barry	50 SSB
VK2DXE	Alan	47
VK2KU	Guy	47 Digi
VK7MO	Rex	47
VK3KAI	Peter	46 SSB
VK3WRE	Ralph	46 SSB
VK2DXE	Alan	43 SSB
VK3CAT	Tony	39
VK3KEG	Trevor	39
VK4TZL	Glenn	38
VK2TK	John	35 SSB
VK4KZR	Rod	35
VK3KAI	Peter	33 Digi
VK3ZUX	Denis	33 SSB
VK6HK	Don	33
VK3ZYC	Jim	31
VK7MO	Rex	30 SSB
VK3KME	Chris	28 SSB
VK2KRR	Leigh	27 FM
VK2TK	John	27 Digi
VK4DFE	Chris	26 SSB
VK2TG	Bob	24 SSB
VK7MO	Rex	24 Digi
VK3YB	Phil	23
VK5ACY	Bill	23 SSB
VK2EAH	Andy	21
VK3HV	George	21 SSB
VK3TLW	Mark	20 SSB
VK6KZ	Wally	20
VK3BBB	Brian	19
VK3AL	Alan	18 SSB
VK6KZ/p	Wally	16
VK3ZYC	Jim	14 SSB
VK3DMW	Ken	13
VK2CZ	David	12
VK2EAH	Andy	12 SSB
VK7ZSJ	Steve	12
VK2EI	Neil	11 Digi
VK4CDI	Phil	11
VK2DXE/p	Alan	10
VK3ANP	David	10
VK3BG	Ed	10
VK2EAH	Andy	9 Digi
VK6HK	Don	6 Digi
VK2TWO	Andrew	5
VK3ZDR	David	5 SSB
VK2AKR	Neil	3 Digi
VK2DXE	Alan	3 Digi
VK4TJ	John	3 SSB
VK6DXI	Mirek	3 FM
VK2AKR	Neil	1 SSB
VK3XLD	David	1 Digi
VK4CDI	Phil	1 Digi

144 MHz EME

VK2FLR	Mike	110
VK2KU	Guy	89
VK7MO	Rex	87 Digi
VK3CY	Des	70
VK2KRR	Leigh	24
VK3HZ	David	4
VK3KEG	Trevor	4
VK3FMD	Charlie	3
VK2DVZ	Ross	2
VK2DXE	Alan	2
VK4CDI	Phil	1

432 MHz Terrestrial

VK2ZAB	Gordon	57 SSB
VK3PY	Chas	50 SSB
VK3FMD	Charlie	47
VK3XLD	David	47 SSB
VK3ZLS	Les	40 SSB
VK2KU	Guy	38
VK2KU	Guy	34 SSB
VK3EK	Rob	34 SSB
VK3HZ	David	33
VK3CY	Des	32
VK2DVZ	Ross	31 SSB
VK3BJM	Barry	30 SSB
VK3KAI	Peter	28
VK3KAI	Peter	27 SSB
VK3BDL	Mike	26
VK3WRE	Ralph	26 SSB
VK3TMP	Max	25
VK3KEG	Trevor	21
VK2TK	John	18
VK2TK	John	17 SSB
VK7MO	Rex	17
VK3ZUX	Denis	15 SSB
VK3CAT	Tony	14
VK4KZR	Rod	14
VK3TLW	Mark	13 SSB
VK6KZ	Wally	13
VK2KRR	Leigh	11 FM
VK4TZL	Glenn	11
VK3AL	Alan	10 SSB
VK3ANP	David	10
VK3BG	Ed	10 SSB
VK3YB	Phil	10
VK2TG	Bob	9 SSB
VK4DFE	Chris	9 SSB
VK3KME	Chris	8 SSB
VK6KZ/p	Wally	8
VK3BBB	Brian	7
VK2FLR	Mike	6
VK4CDI	Phil	6
VK7MO	Rex	6 Digi
VK2KU	Guy	5 Digi
VK3HV	George	5 SSB
VK3KAI	Peter	4 Digi
VK3PY	Chas	4 Digi
VK3XLD	David	4 Digi
VK3ZYC	Jim	4 SSB
VK2CZ	David	3
VK2TWO	Andrew	3
VK6DXI	Mirek	3
VK2DXE/p	Alan	2
VK4TJ	John	2 SSB
VK2AKR	Neil	1 SSB
VK2TK	John	1 Digi
VK3DMW	Ken	1

432 MHz EME

VK4KAZ	Allan	14 CW
VK3FMD	Charlie	5
VK3HZ	David	1
VK7MO	Rex	1

1296 MHz

VK3XLD	David	35 SSB
VK3PY	Chas	34 SSB
VK3FMD	Charlie	32
VK2ZAB	Gordon	29 SSB
VK3ZLS	Les	26 SSB
VK2KU	Guy	25
VK2KU	Guy	22 SSB
VK3EK	Rob	20 SSB
VK3KWA	John	19
VK2DVZ	Ross	16 SSB
VK3KAI	Peter	16
VK3WRE	Ralph	16 SSB
VK3KAI	Peter	15 SSB
VK3BDL	Mike	12
VK3BJM	Barry	12 SSB
VK3TMP	Max	11
VK2TK	John	10 SSB
VK4KZR	Rod	10
VK7MO	Rex	10
VK3HZ	David	9
VK3TLW	Mark	8 SSB
VK3AL	Alan	7 SSB
VK2CZ	David	5
VK3HV	George	5 SSB
VK3ZUX	Denis	5 SSB
VK3ZYC	Jim	5
VK6KZ/p	Wally	5
VK3BG	Ed	4 SSB
VK3BVP	Shane	4
VK3YB	Phil	4
VK3ZYC	Jim	4 SSB
VK6KZ	Wally	4
VK2KU	Guy	3 Digi
VK3BBB	Brian	3
VK3KEG	Trevor	3
VK2DXE/p	Alan	2
VK2FLR	Mike	2
VK3CY	Des	2
VK3KAI	Peter	2 Digi
VK3KME	Chris	2 SSB
VK3XLD	David	2 Digi
VK4TJ	John	2 SSB
VK6DXI	Mirek	2
VK3DMW	Ken	1
VK3ZYC	Jim	1 Digi
VK4TZL	Glenn	1
VK7MO	Rex	1 Digi

2.4 GHz

VK3PY	Chas	11 SSB
VK3XLD	David	11 SSB
VK3WRE	Ralph	9 SSB
VK3FMD	Charlie	8
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK3HV	George	4 SSB
VK6KZ	Wally	4
VK3BJM	Barry	3 SSB
VK3KAI	Peter	2 Digi
VK4KZR	Rod	2
VK3BG	Ed	1 SSB
VK3TLW	Mark	1 SSB
VK3ZUX	Denis	1 SSB
VK4TZL	Glenn	1

3.4 GHz

VK3FMD	Charlie	8
VK3WRE	Ralph	6 SSB
VK3KAI	Peter	5 SSB
VK3HV	George	4 SSB
VK3XLD	David	4 SSB
VK6KZ	Wally	4
VK3EK	Rob	3 SSB

5.7 GHz

VK3FMD	Charlie	10
VK3WRE	Ralph	9 SSB
VK3KAI	Peter	7 SSB
VK3XLD	David	5 SSB
VK6KZ	Wally	4
VK3BJM	Barry	2 SSB
VK3EK	Rob	2
VK3HV	George	2 SSB
VK6BHT	Neil	2 SSB
VK3KAI	Peter	1 Digi
VK3ZUX	Denis	1 SSB

10 GHz

VK3FMD	Charlie	9
VK6BHT	Neil	9 SSB
VK3WRE	Ralph	8 SSB
VK3XLD	David	8 SSB
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK6KZ	Wally	5
VK3HV	George	4 SSB
VK3PY	Chas	3 SSB
VK3TLW	Mark	3 SSB
VK3ZYC	Jim	3 SSB
VK2EI	Neil	2 SSB
VK3BJM	Barry	2 SSB
VK3ZUX	Denis	2 SSB
VK7MO	Rex	2
VK3BG	Ed	1 SSB
VK4KZR	Rod	1
VK4TZL	Glenn	1

24 GHz

VK6BHT	Neil	3 SSB
VK2EI	Neil	2 SSB
VK6KZ	Wally	2
VK3FMD	Charlie	1

474 THz

VK7MO	Rex	1

Additions, updates and requests for the guidelines to Guy VK2KU, vk2ku@tsn.cc, or by mail (QTHR 2005).
The guidelines (and the latest League Table) are also available on the website of the NSW VHF Dx Group at www.vhfdx.radiocorner.net - click on Gridsquares.
Next update of this table will be in mid March 2005.
Stations who do not confirm their status for more than 12 months may be dropped from the table.

ar

Over to you

AR Article by Michael Owen

Dear Michael,

I have just read your article in AR about the proposed revision of the examination system.

I wholeheartedly support the ideas set out. I particularly like, the facility to give exam candidates an indication of their success or failure at completion of the exam or soon afterwards. Most importantly, for those who may not have passed, an indication of where they need to improve their knowledge or skill.

From my own experience a few years back, I know how nerve wracking it is waiting for up to six weeks to find out.

I passed my Novice Theory and 5 words Morse first go. If I had not, I would have wanted to get straight onto more study of the areas that I had missed out on.

For my Intermediate Licence, I was never sure which areas of the Advanced Theory I had done well in and which I had not.

The idea of accredited Assessors is a good one. It is consistent with Nation Competency based training and assessment in the workplace.

No system is perfect. It does seem logical however, to take advantage of the large amount of work already put into this area. I refer to changes made to workplace and educational training and assessment standards.

There are a number of Amateurs who act as invigilators and educators for Amateur Radio who are already qualified as teachers, lecturers or specialists in their field of knowledge. It would be counterproductive not to make use of their skill, experience and motivation to further the Amateur Radio Hobby and service.

I hope that what you have proposed is accepted. It would in my view improve the way the examinations are conducted. I believe that it would also encourage unsuccessful candidates to brush up on weak areas of knowledge and attempt the exam again.

The current system can be very discouraging to unsuccessful candidates. We did not all find it easy, especially those of us who do not have a work background in electronics.

Greg Arrell VK2KGA

More than 15 mins

Your correspondent VK6PF Fred Parsonage is entitled to his opinion but I could not let his letter in the November 2004 issue of 'Amateur Radio' go unchallenged.

This is a problem of today's negativity; this is not right! that is not right! I suggest to the writer that he SHOULD read all the articles and not be a "15 minute flip through wonder". He might just learn something. I am surprised that Fred took only 15 minutes reading to cover the articles he mentioned, not a lot of depth? If the authors make the time and effort to research, develop and write articles it is up to us all to make the time and effort to read them. As a general policy I read all articles in AR, sometimes the title might look uninteresting but I have been fooled many times and have found the article of value. I have learnt something from each one of them, be it a different slant, point of view or result. This in itself makes it interesting and worthwhile

I have had a technical problem which I have had unresolved for over two years in spite of reading and research. This problem was resolved by a recent article of Drew Diamond's. If I had taken VK6PF's attitude the problem would still be, in all probability, unresolved.

Fred, how about contributing an article to AR instead of moaning.

You can be assured that it will be read by at least one person, Is that worth the effort?

Dave Rosan ZL1AFQ
Mairangi Bay, Auckland.

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

Silent key

David Robert "Dave" Gibbons VK1GD

It is with deep regret and sadness that we record the passing of David Robert Gibbons on 29 July 2004, just one day after his 78th birthday. Dave as he preferred to be known amongst the amateur fraternity, was UK born and served with the British Military Forces in Royal Signals Corps in such places as India and Japan.

He is best known for his experimentation both in his employment at the ANU and as an amateur radio operator, in the latter, trying to fathom the mysteries of antennas and propagation; he spent considerable effort attempting to understand EH and Cross Polarization radiators.

Dave had an extreme depth of knowledge in the fields of physics and electronics and in particular associated instrumentation. He is fondly remembered by amateurs in VK1 as an eagerly helpful and generous peer, especially to the many novices that eventually graduated to full call status, after upgrading during the 70's from VK1NDG to VK1GD.

Some of his on-air involvements were 10-10 participation, JOTA and net participation. He was recently net controller of the Royal Signals net. Dave suffered a major loss on 12 July 2004 when his wife Reiko passed away and at the time contracted a severe case of pneumonia, which he eventually succumbed to. He is fondly remembered and sadly missed by his daughters and sons-in-laws Melanie and Rodney, Beryl and Ray, Estelle and Dennis, Heather and Scott and his great grandchildren and grandchildren. Vale "Dave" Gibbons VKIGD.

Submitted by John Clare VKICJ.

Antennas:

Some useful wire antennas for HF

Part 3

Rob S Gurr VK5RG concludes his series on wire antennas.

Quarter wave sloper

This must be the cheapest effective and useful antenna available. In the simplest form it may be considered a quarter wave vertical, but fed at the top instead of the bottom. The "ground plane" is the support tower and the mass of the other beams and antennas mounted on the tower. I have fabricated a mast clamp that enables me to secure it to the top of a tower, and from this clamp have run a quarter wave wire to a nearby pole or tree. A coaxial cable socket is available to connect the feedline. Tuning is by altering the length of the wire a few inches either way, as guided by an SWR reading, or noise bridge.

The initial SWR should be quite low; however, it may be improved by moving the bottom of the wire from place to place in the yard. Best SWR may sometimes be time consuming to achieve, but it will be worth it. The antenna has a low angle of radiation and on 7 MHz has provided me with USA contacts that have not been possible on a centre fed dipole. If you have a tower and a spare coax running to its top, this is a "Bonus" antenna.

Full wave loop

The use of a full wave horizontal loop at a very low height has become popular throughout the world in recent years. Erection of a large multiband array in a moderate size suburban backyard has been the wish of many hams. Although not large, the full wave loop has a great deal to offer.

In its general configuration, a full wave of wire is suspended (as a square of equal sides) at between three and ten metres above the ground. One corner, or the centre of one side, is fed with open wire line and the array matched at whichever frequency is desired. The radiation is predominantly through the plane of the antenna and, therefore, is directly vertical to the ionosphere. This is of great assistance, as reflected power is toward the ground and may spread over up to 1,000 km.

There is a need to consider some aspects of the ionosphere to understand the working of such an antenna:

1. The ionosphere surface is not a clear reflecting plane as is a glass mirror. It is a most uneven surface, with sections so irregular in shape that reflections may occur at many angles, hence the resultant broad geographic coverage (both on long distance hops or local vertical incidence paths as in this case).
2. There is a frequency above which the radio wave is absorbed by this surface, varying from time to time, season to season, known as the critical frequency.

The overall benefits of such an antenna are, therefore, good low frequency coverage over a local path and at no great expense of supports. Above the critical frequency, at perhaps 14 MHz, random lobes from the horizontal wires, which may have a reasonably low angle of radiation, can give acceptable DX performance.

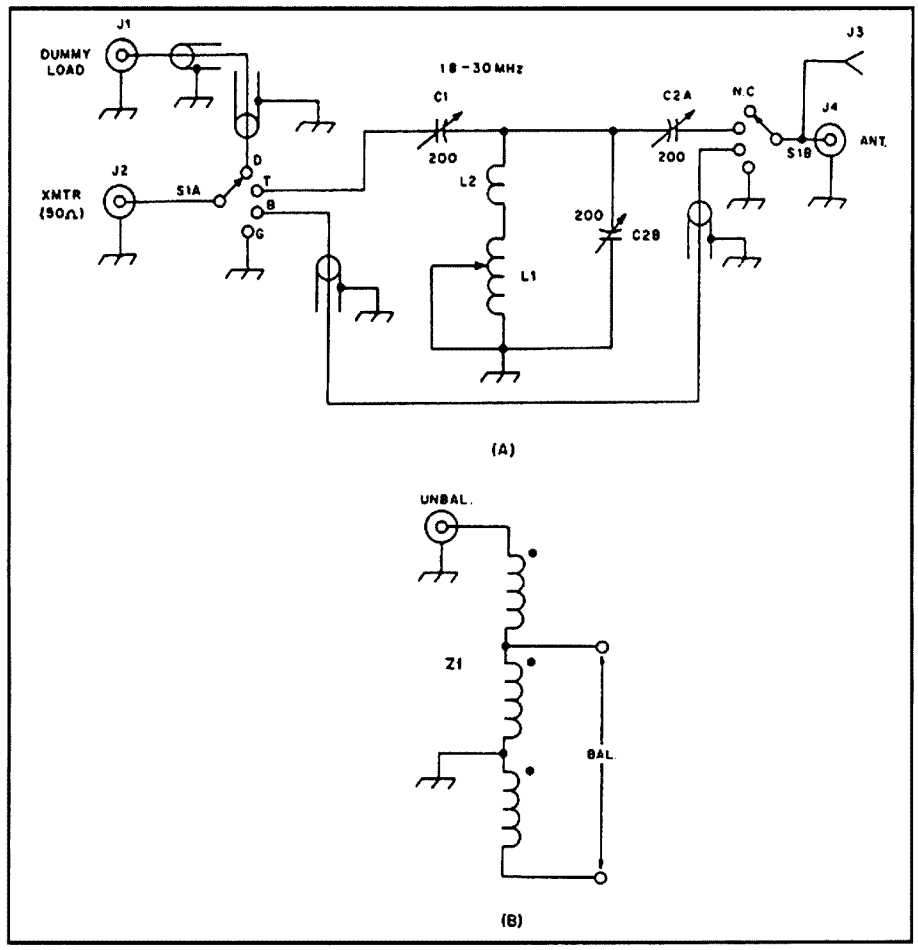


Figure 23 - Schematic diagram of the SPC transmatch. Capacitance is in picofarads. *(Reprinted from the* ARRL Handbook, *1988 Edition, page 34-16)*

A number of such low antennas may be used for multiband work. I mention them mainly in the context of their low frequency usefulness. A typical antenna may be erected as a 10 metre-a-side loop on three metre high masts, or on short poles protruding from the top of fruit trees, and give a 7 MHz signal into a nearby state comparable to a full size dipole at 15 metres used by another ham for DX work. The principle here is never to consider your back yard too small to erect an antenna, which will be effective in some way or other! The point at which such a loop is fed is more a matter of convenience than an electrical requirement, although the need to retain symmetry should be observed. I have seen some fed with coaxial cable via a balun; however, the practicality of using it on a number of bands makes the use of open wire line very attractive.

Alternative forms

I have encountered many of these antennas with a terminating resistor opposite the feedline point, as well as some with an open circuit at this point. These may provide some with an experiment or two to work out the worth of such modifications.

Antenna tuning unit

Coupling the feedline of the antenna to a transmitter is arranged through an antenna tuning unit (ATU). This item may be treated as a "black box" that matches the impedance found at the end of our feedline, on the various bands, to the 50 ohm load impedance of our transceivers. The feedline lengths may be chosen to arrange for either a current or voltage node to be present at the ATU terminals, where either a series or parallel resonant tuned circuit would simplify the adjustments.

Modern tuning units of the "SPC" (Fig 23) or "Z Match" (Fig 24) designs are more tolerant to complex impedances and it is not necessary to use "resonant" feedline lengths with these. The components within these ATUs are altered, by the adjustment of the controls, for a reverse power between the transmitter and the ATU of zero. This completes the matching process.

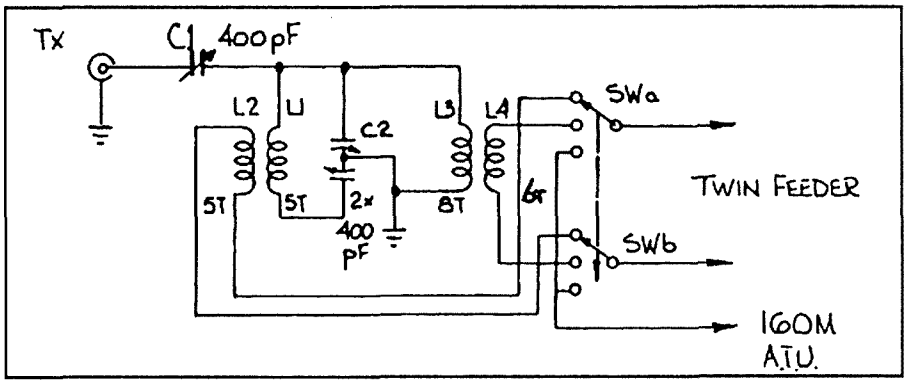


Figure 24 - The Z Match.
(Reprinted from Amateur Radio, *September 1984, page 17)*

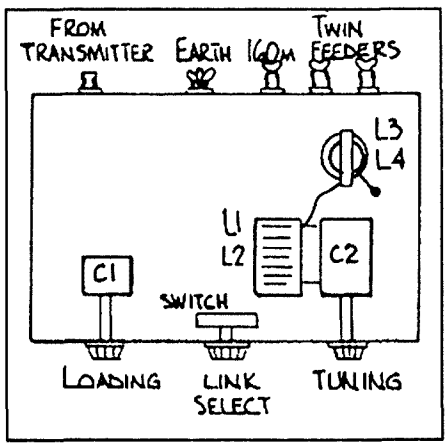


Figure 25 - The Z Match layout.
(Reprinted from Amateur Radio, *September 1984, page 17)*

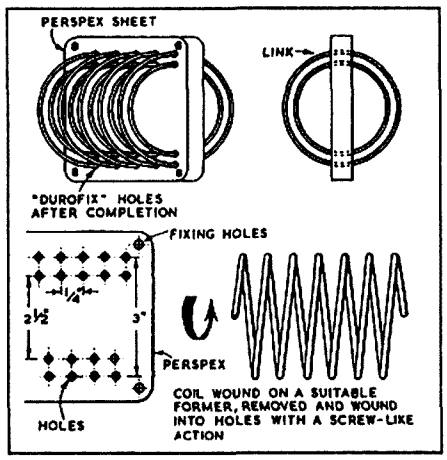


Figure 26 - Coil construction for the Z Match.
(Reprinted from the RSGB Amateur Radio Handbook, *3rd edition, page 369)*

Z Match antenna tuning unit

The Z match antenna coupling unit has been very popular for a number of years since it was featured in ARRL and RSGB publications, and more recently in Amateur Radio magazine. Many units have been described using an assortment of coil dimensions and layouts, including single and two coil set ups, and units to cover from 1.8 to 30 MHz.

I have had success with the RSGB version (Fig 24), which covers 3.5 to 30 MHz only, and have now successfully built a number of these. My modified version has been copied by several VKs, and while the RSGB description gives excellent information on coil construction, the suggested layout gives extremely long leads to the 14-30 MHz range coil, which is overcome in the modified version (Fig 25).

This layout places the higher frequency coil directly between the fixed terminal lugs on the two gang (H gang!) capacitor. On both the RSGB and ARRL circuits, each link is marked for 3.5/7 or 14/21/28 MHz, which has caused difficulties for many constructors, as some feedline lengths present impedances to the coupler which may be matched better by the alternative connection. I solved this problem by using a 3-position, 2-pole switch that allows the twin feeder to be connected to either link (positions 1 and 2) or to the external terminal mounted on the rear panel of the coupler (position 3). This last terminal allows the twin feeder to be used as a top-loaded vertical antenna on 1.8 MHz through an additional antenna coupler, or as a general coverage receiving antenna.

The coils may be 63 mm and 75 mm in diameter, as shown in the diagrams, and 14 to 16 SWG wire is suitable. The coils should first be wound around a cylindrical former (eg an electrolytic capacitor) of smaller diameter, and then threaded into the holes in the perspex support. A suitable adhesive (eg plastic cement) may be used to fix the coils in the holes (Fig 26).

For power up to 100 watts, standard single- and two-gang broadcast receiver tuning capacitors are quite suitable, with Stromberg "H" gangs preferred. For higher power, a pair of transmitting variable capacitors, with adequate plate spacing, should be used. Note that C1 needs to be insulated from ground and from the COUPLING control knob. The frame and rotor of C1 should be connected to the transmitter output, while the stationary plates should be connected to L1.

A most essential requirement is the use of vernier dials on the drive shafts of the two capacitors. It is impossible to tune capacitors of these maximum values with the fine accuracy needed to set the match correctly, without such dials.

The "Z" match is constructed on a simple U-shaped chassis, with a second U-shape of perforated metal as a top cover. The front panel controls are LOADING, LINK SELECTION and TUNING.

The unit should be used with a good earthing system. A minimum 1.5 m length of 20 mm galvanised water pipe should be driven into the ground

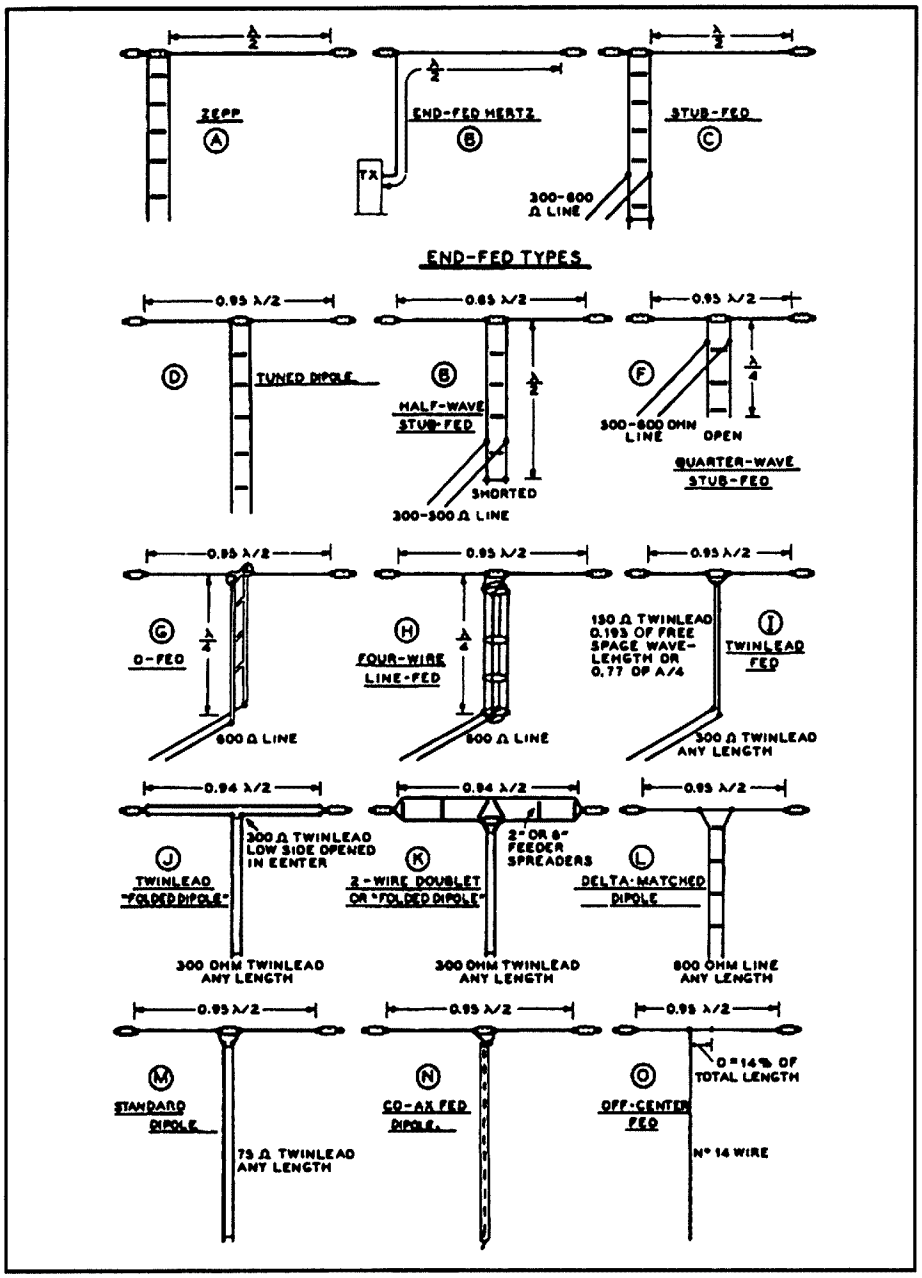


Figure 27 - Feed systems for a half-wave dipole antenna.

immediately behind the antenna coupler and, from an earth clamp on this pipe, a length of 6 mm or larger copper wire run to the earth terminal on the ATU. One to two metres of wire should be enough. Additionally, bonding of this earth system to nearby water pipes, galvanised steel carports or other metallic structures will improve efficiency when using unbalanced-feed antennas.

Although the Z match will normally be used with balanced lines, I have frequently used it to couple to coaxial cable, and have a standard connector mounted on the rear panel, adjacent to the balanced terminals and suitably insulated from the panel. A small switch or jumper clip may be used to earth the outer of the coaxial socket to the chassis, should this be necessary.

Dipoles

In Fig 27 I have presented 15 ways of feeding a half wave dipole - there are surely more! Few of these may be used with multiband wire antennas; however, all give a great basis for further experimentation with antennas.

It may come as a surprise to a large proportion of readers that there are so many possible methods. I offer them as a starting point for your next antenna matching experiments.

Conclusion

I have presented some useful antennas in this article. Some basic details have been supplied and a few hints given on methods of construction. No paper on this very broad subject can be complete in all details; however, I refer you to the list of publications to read, and conduct experiments with some of my comments in mind.

I am sure you will have plenty of fun, learn a lot about antenna theory, and obtain plenty of contacts with all parts of the world. I cannot help solve the current high frequency propagation problems.

However, with a suitable antenna, you should have good contacts when the various bands are open.

Further reading on high frequency wire antennas

'Wire Antennas'; Rob Gurr VK5RG, *Amateur Radio* September 1984.

'Broadband High Frequency Antennas'; Rob Gurr VK5RG, *Amateur Radio* January, 1988

'High Frequency Dipole Antennas'; Joe Carr K4IPV, *Ham Radio* June, 1989 (p12).

'Non-resonant Delta and V Beam Antennas'; Robert Wilson KL7ISA, *Ham Radio* May, 1990.

'High Frequency Directive Arrays'; William Orr W6SAI, *Radio Handbook* 20th Ed, Ch 24 to 29.

'Multiband Antennas'; Chip Angle N6CA and others, The *ARRL Antenna Book* 15th Edition.

'Antenna Projects': John Bloom KE3Z and others, *The ARRL Handbook* 1985, Ch 33. *Novice Antenna Handbook;* Doug DeMaw W1FB, *ARRL* 1988.

'W1FB's Antenna Notebook'; Doug DeMaw W1FB, *ARRL* 1987

'ZL Special 2 m Beam'; Fred Judd G2BCX, *Out of Thin Air Practical Wireless.*

'Horizontal "Zeppelin" Antenna'; page R 38, *Handbook of Wireless Telegraphy*, 1938 (Admiralty).

ARRL Antenna Compendium Vol 1, 1985 Edition.

ARRL Antenna Compendium Vol 2, 1989 Edition.

ARRL Antenna Compendium Vol 3, 1992 Edition.

'Low Band DXing'; John Devoidre ON4UN, *ARRL* 1987.

'Antenna Anthology'; ARRL 1978.

'Practical Wire Antennas'; John D Heys G3BDQ, *RSGB* 1989.

Acknowledgments

The author acknowledges some drawings and diagrams copied from the following publications: *Radio Handbook, Amateur Radio, ARRL Publications, RSGB Publications,* and *Ham Radio.*

Rob S Gurr VK5RG

35 Grandview Avenue, Urrbrae, SA 5064

ar

Peter Naish VK2BPN

On Sunday 9 January 2005 Peter Naish VK2BPN, passed away in St Vincent's Hospital, Sydney. He had suffered a heart attack the previous Thursday.

Peter was born in England in 1931, and graduated from University College London in 1952 as a Batchelor of Electrical Engineering.

From 1952 until 1967 Peter worked for Marconi, initially to install, commission and maintain television transmitters in various countries, including Australia, later to design TV transmitters, particularly high power UHF transmitters, and later high power satellite earth stations.

Peter finally settled in Australia after many visits, starting around 1952.

Between 1967 and his retirement in 2001, Peter was employed by STC Australia, later Alcatel Australia, initially as an engineer, later as a Marketing Manager then as a Product Manager and then working as Project Manager for projects ranging from telephone exchange contracts to microwave link projects.

Peter was first licensed as G3EIX, then as VK2BPN.

Peter has held various positions in amateur radio.

Peter became Federal Secretary of the WIA in August 1995, a position that he held apart from a brief period until his death. In addition he was Federal President from March 1998 until April 2001.

At the time of his death Peter was Secretary of the WIA, continuing the role he held in the previous Federal Structure. Peter enthusiastically supported the restructure of the WIA to a single national body.

Just as importantly, Peter was elected a Director of IARU Region 3 at the Darwin Conference in 2000, and was appointed Chairman of the Directors at the Region 3 Conference, in Taipai, Taiwan in February 2004.

Peter married Monica in September 1961 and had two daughters, both engineers, one an amateur with the callsign VK2KFN. He had 4 grandchildren.

Despite his great contribution in such positions, Peter was above all a true amateur. He was a member of the First Class Operators Club (FOC). Membership of FOC is reserved for those who can display exemplary CW operating skills and is by invitation only. At any one time there are only 500 members worldwide.

At a moving funeral service at St Kevin's Catholic Church, Eastwood, on Friday, 14 January 2005, IARU Region 1 and Region 3 were represented, and very many of his friends from amateur radio and the WIA were present.

Tributes had flowed in from many national radio societies, as well as from his many friends in so many countries.

The loss of Peter is a great loss to amateur radio. It is a great loss to the amateur radio organisations he supported, including the WIA. But above all, Peter was a true gentleman and a true amateur. His passing is a loss to all of us.

Michael Owen VK3KI, Barry White VK2AAB, Chris Jones VK2ZDD

Greetings from the Cook Islands

Royal Cook Island Radio Club conducts amateur radio courses and exams, to the same syllabus as the New Zealand amateur radio requirements.

High school students have an open invitation to visit our club, to operate or observe, and we show them how amateur radio contributes to their safety during hurricane season.

We encourage them to monitor the VHF FM Marine frequencies, listen to their family and friends out fishing and explain the similarity between those frequencies and 2 metre amateur.

Two local candidates have recently gained their unrestricted licences.

For many years Stuart Kingan ZK1AA (Now a silent key) ran the Satellite Peacesat Station and maintained HF links to the outer Cook Islands. The Cook Island Government even buried the power cables past Stuart's waterfront property at Matavera, Rarotonga so as to make sure his station ZK1AA had no electrical interference.

ZK1JD Jim Ditchburn coordinates most of the Boys Brigade/Scouts and Girl Guide Activities. He opens his station for use in October's JOTA activity.

Victor Rivera ZK1CG/ZK1USA is the islands' most active DXer. He also takes groups to the outer Cook Islands (North Cook) and they go up by boat, to places like Manahiki and Penryn.

We are associated with SATERN (Salvation Army Team Emergency Radio Network). Regular SATERN skeds are kept to practice handling traffic and to ensure our equipment is maintained properly.

We keep regular skeds with the Inter Island Net on 14.314.00 MHz at 0700 UTC and SEANET 14.320.00 MHz at 1200 hrs UTC.

ZK1DD Des Clarke, a resident on Aitutaki, has regular skeds on Monday-Wednesday & Friday on 14.131.00 MHz USB at 0400 UTC and talks with Dick Best 3D2BA in Sigatoka, Fiji.

Sadly, Tuatia Topou ZK1MA, the only resident ham on Manahiki Atoll, in the Northern Cook Islands, is now a silent key. Tuatia ran the local general store and had an excellent fist for CW.

We are interested in seeing what the Australian Foundation Licence comprises.

Any visiting WIA member is welcome to use our club station whilst here. We will provide advice and assistance, in advance, if needed to assist visiting hams obtain a licence and ZK call sign.

Are Ra, Kia Manuia!

James GOODGER ZK1DG
Royal Cook Island Amateur Radio Club.
pukapan@yahoo.com

ALARA

Christine Taylor VK5CTY

The new year

Around the rim of the Indian Ocean it has been a very grim end to 2004 and start to 2005, but we are proud to know that amateurs on the spot and around the world are busy handling emergency traffic in places where there are no phone lines and where even mobile phones are unable to operate.

In the Andaman Islands, at Port Blair, it was a YL, Bharti VU4RBI, who, as leader of the Dxpedition to the Andaman and Nicobar Island, first made contact with the world after the tsunami hit on Dec 26th. The group were the first ham operators allowed to operate in those islands for 17 years, but they gave up the DX opportunity to provide a link to the authorities and to the news services.

There had been 'a total failure of all governmental communications' from that region until the hams of this expedition started operating, as reported in the evening news programs in India.

Elsewhere, in Sri Lanka, for example, ham operators were actually asked by the Prime Minister to set up a station inside his house to provide essential contact to the outside world and with outlying parts of the country.

I am sure, like me and all members of ALARA, you are proud to be part of a group who rise to the occasion in all times of emergency.

Please keep a listening watch and assist wherever possible.

The contest

The results of the ALARA Contest were published in the December issue of AR, but as there were some old and new names on the results list, some congratulations are in order.

To Gwen, again a worthy winner. To achieve such a high score Gwen VK3DYL works hard right through the contest. She is grateful for the support of her local club members and to her friends around the world for their assistance. No one can get a high score without having someone with whom to make a contact, and to make repeated contacts.

VK5 had a new winner in Shirley VK5JSH, and there were several new stations which submitted logs this time.

Thanks to everyone who contested. Please be there again this coming year.

The International YL Meet in Seoul

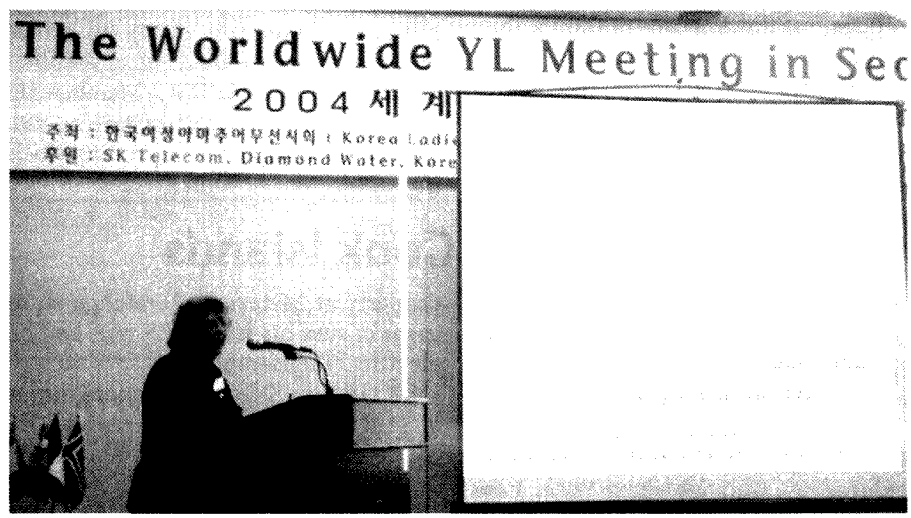
As can be seen from the following report, the whole Meet was very successful if full of surprises.

One of the photographs shows Gwen VK3DYL making a PowerPoint presentation at the Meet, about her DXpeditions. It was very well received – as it was the first PowerPoint attempt by Gwen, she deserves congratulations both for the actual presentation and for improving her computer skills.

Incidentally, with reference to those DXpeditions, Gwen has sent out over 10,000 QSL cards and is gathering more by the tens and scores all the time... Keep her busy please!!!

Gwen's report on the Seoul MEET

"Early in October the Capital Hotel in Seoul resounded with cries of joy as YLs from around the world met up with their friends and checked in for the 7th International YL Meeting. 195 YLs and OMs from 14 different countries attended this Meet in "The Land of the Morning Calm", South Korea. I counted 13 ALARA members present - June/VK4SJ, Maria/VK5BMT, Carol/WD8DQG, Truus/VE3MRS, Ruth/IT9ESZ, Umi/LA6RHA, Raija/SM0HNV, Sarla/VU2SWS, Walli/DJ6US, Mio/JR3MVF, Ayako/JR1VTY, Evelyne/F5RPB and myself Gwen/VK3DYL.



Gwen VK3DYL giving her PowerPoint presentation

Our welcome started at Incheon Airport with a banner held aloft by some of our hosts so we'd know who to look for, and that was followed by a big surprise as we drove down the multi-lane highway towards our hotel – as we came to the toll-bridge across the road, there was another bigger banner, in lights this time, again welcoming us. In fact, everywhere we went there were banners, even on the side of our sight-seeing buses, proclaiming to all and sundry that the YLs of the world were gathered in Seoul for a get-together.

The HL Committee, under the Chairmanship of Chae, Do Sook, HL2KDW, had arranged a programme to enable us to see as much as possible of the country's culture and history plus some "get together" time at presentations and dinners. During the Meet itself and the 2 optional tours following it, we saw temples, Buddhas, museums, a

magnificent bonsai garden, a Korean Folk Village, etc. The local Radio Club happened to be holding their monthly Flea Market and invited us to pop in so the members could meet us – the pre-loved goods for sale looked very familiar – hi!

We toured SK Telecom and the Ubiquitous Dream Hall where one can easily see the shape of digital life in the future – from digital homes to offices, schools, cars etc. – the world's first virtual display of a futuristic lifestyle. I would have liked to bring home one of their "Intelligent Robots" – it might have given me more time to play radio.

Another tour was to the DMZ (Demilitarized Zone) – the border between North and South Korea. And, no, we weren't allowed to sneak across and call CQ de P5!

We were taken to two typical Korean performances – one set in an old-time Korean kitchen where the 4 performers banged with chopsticks on various kitchen utensils to produce some very loud music (?), whilst the other was held in a traditional Korean house where a group of Korean dancing girls performed a series of intricate traditional dances and drum playing.

Back at our Hotel, we had a few presentation slide shows, one of which I gave on "YL DXpeditions Down Under". The final night of the Meet saw each country put on some sort of an act with Maria, VK5BMT, gamely getting up and singing Waltzing Matilda on Australia's behalf while everyone else present roared out the choruses – not always in English! Joining in a conga line became very popular between acts, and one was never sure whether one was coming or going. But it was fun and very noisy. But the noise and singing was nothing to that experienced on the night before the survivors left for home. Luckily the café belonged to a friend of Chae, so we all sang, Karaoke style, till the roof just about lifted off.

In between all this we visited a couple of street markets, with the end result that some of us had to buy an extra suitcase to bring all the goodies home. Korea is a shopper's paradise!

I was sorry I didn't have time to operate the special radio station set up in the hotel – DT04YL – but we were just so busy! My other memories of South Korea are – the cleanliness of the streets; the horrific lanes of traffic on the motorways; the skill of the local drivers when they wanted to go from the right-hand lane across 4 or 5 other lanes to get into the far left lane (no way Jose, would I drive there!!); the friendliness of the people, even at the street market stalls when one refused their urgings to buy; the day spent on Jeju Island; the busloads of school children on excursions to visit cultural sites, and last but not least the spicy food cooked at the table with never a bit of bread in sight!

Sarla, VU2SWS, made the offer to host the next, 8th, International YL Meet, so the farewell cry as people left for the airport was "See you in Bombay in 2 years' time". Here's hoping!

de Gwen, VK3DYL ~

VK YLs in Seoul - Gwen VK3DYL, June VK4SJ and Maria VK5BMT

The QSL Buro at the Flea market

Don't forget the ALARAMEET over that September weekend

Applications are coming in but there is room for more, for the weekend of September 9th/10th and 11th. We hope some of the early YLs in ALARA will have made contact by then too, so that we can know how they are and what they are doing now. Maybe one or two of you will decide to join us. That would be marvellous. Just contact Marilyn VK3DMS QTHR or go to our website, www.alara.org.au for more information.

We expect there to be some overseas visitors as well as YLs and their OMs from around Australia, all present and ready to enjoy some face to face contacts.

Know your secondhand equipment

Ron Fisher VK3OM.

The Yaesu FT-7B and the FT-77

Before starting my description of these two interesting transceivers, a few comments on things I have overheard on the low end of 80 metres over the last few months. It seems that one of the main discussion topics is which ATU should be bought. I have to question this. First, why do you need an ATU at all? And second, why buy one, why not build one?

At my location I have six HF antennas and only one needs an ATU. That one is a very long dipole, centre fed with open-wire line. It requires a balanced ATU to work. It is an excellent all band antenna and is highly recommended. A balanced ATU is easy to make. See Drew Diamond's new Volume 3 of Radio Projects for the Amateur.

The other five are all fed with 50 ohm coax cable and do not require an ATU. These all have a low SWR, mostly well below 1.5 to 1 across all the bands they are designed to work on.

Before spending a couple of hundred dollars on a whiz bang ATU, carefully work out what you really need. That money might be better spent on a good mast that will really help you get out better. Don't get the idea that I am anti ATUs. I am not. They certainly have their place, but make sure you know where that place is. It's just that many newcomers seem to think that a poor antenna can be made better with an ATU. If you have any ideas on the subject, please let me know so we can share your experiences.

Now, on to the subject in hand.

FT-7B

The FT-7B was released on the local market in early 1981. It sold for $599 and, for a time, sold alongside the FT-7. The main difference with the "B" model was an increase in power output to about 50 watts from the 15 watts of the FT-7. The specification for the 7B actually rates the power at 100 watts input PEP. However, there were other subtle differences and also a small range of matching options.

In appearance the two looked almost the same, but close inspection will show quite a few changes. Let's see what they are. The first important change was to provide four band-switch positions for the ten metre band. However, only one of these was supplied with the appropriate crystal that gave coverage from 28.5 to 29 MHz, the same as the original FT-7. The other three crystals were optional extras.

For CW operators an audio peak filter was included. This had a bandwidth of just 80 Hz at -6dB that could prove very handy. AM was included with an additional switch added to the function panel to select it; however, reception was through the SSB filter which could not produce reasonable audio quality. The switch's alternate position selected the CW mode and the peak filter.

An RF attenuator with a red LED indicator could be selected by pulling the microphone gain control out. From memory it gave about 20 dB attenuation. The drive control was mounted concentrically with the "tune" control and this gave adjustment of the RF power output in the CW and AM modes.

Options available for the FT-7B included an external digital display, the YC-7B. This was designed to be used when running the 7B mobile and could be mounted on the car dashboard. I am not sure if it could be adapted for use with the FT-7. Perhaps someone could fill me in on that.

Also, a very nice matching power supply, the FP-12, was available. This was rated at 12 amps, but could actually run a 100 watt output SSB transceiver so long as you kept the gain down a bit and didn't run compression. It had a built in speaker of quite reasonable quality.

On the air the 7B performed much the same as the FT-7, in other words quite well for the time. You won't be disappointed.

So where does that leave the FT-7B today. Firstly, the 7B never achieved the same popularity as the original FT-7. It had a lot going for it, but perhaps it was just a bit late on the scene. It is not seen on the secondhand market very much and, when it does, brings very little more than the FT-7. Expect to pay around around $250 to $300 for a good unmarked example.

The YC-7B display would be very hard to find. I cannot recall ever seeing

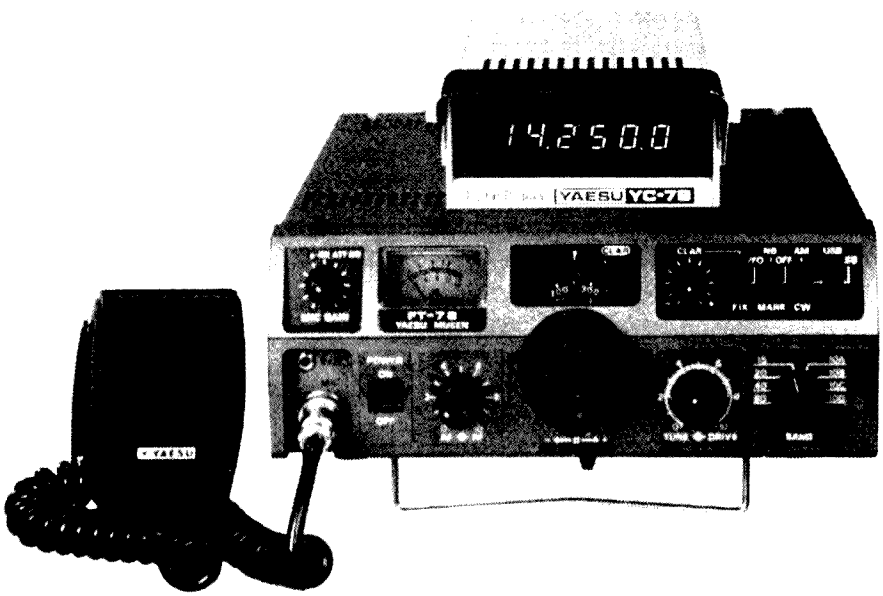


Photo 1 – The Yaesu FT-7B and the YC-7B display unit.

one advertised, but you never know. I recall Dick Smith selling them out at bargain prices many years ago, so there are probably a few sitting in a drawer in someone's shack. The FP-12 power supply is highly recommended. A clean one would be worth about $100.

FT-77

The Yaesu FT-77 was another fairly rare model. The first advertisement I could find for the FT-77 was in the January 1983 issue of Amateur Radio. The price was $650 for the 100 watt version and $520 for the 10 watt model. This version was known as the FT-77S. I should point out that there was also an "S" version of the FT-707. This is, of course, the opposite way around to Kenwood where the "S" indicated the 100 watt output transceiver. The "S" versions are not common and I believe that they were primarily produced for the Japanese home market. However, a few did get here so watch out.

The FT-77 took over from the FT-707 and some notable changes were made. In some respects the 77 was simplified compared to the 707. The width control has gone and the AM facility has also gone. In its place, the FT-77 has FM, but only as an optional extra. I would think this might be hard to find in a second hand example. But, even if it is included, the FT-77 is not usable with ten metre repeaters as no split operation can be selected unless you have the outboard digital VFO.

Photo 2 – The Yaesu FT-77 transceiver.

Unfortunately, the RF gain control has also gone, replaced with a fairly useless squelch control concentric with the AF gain. The bar-graph meter of the 707 has gone and is replaced with a standard moving coil meter that, although small, is very clear. An SWR indicator is now a handy inclusion. Frequency coverage is from 80 to 10 metres including the new (at that time) WARC bands. Like most mid-priced transceivers of the time, no coverage of 160 metres was included.

So, how did the FT-77 perform? For the time, quite well. The VFO stability was very much better than the FT-707 - not up to the later synthesised rigs, of course, but very adequate. Both transmit and receive audio quality on SSB would be rated as better than average. In all, a very good starter rig for the newcomer to the HF bands.

The range of accessories was actually the same as those available for the FT-707 and they consist of the FC-700 ATU, the FP-700 power supply, the FV-700DM digital VFO/memory unit and the FTV-700 VHF/UHF transverter.

So, what is an FT-77 worth today? In excellent condition, about $325 and down to probably $200 for one in ordinary condition. For comments on the accessories see the September issue. But note the type numbers are different. For FC-700, see FC-707. Just add a 7 and to the others in similar fashion. Prices are the same.

That's all for this month, see you at the next Hamfest. Good bargaining.

ar

Silent keys

Geoffery Hunziker VK2BGF

The Taree and District Amateur Radio Club regret to announce the recent death of our esteemed life member, Geoffery Hunziker VK2BGF

His funeral was held in Taree on Saturday December 18.

Geoff was a former PMG telegraphist, a Morsecodian and one of the founders of our Club.

He will be sadly missed by all who knew him.

Sent by John Britton VK2ZJB,
Club Secretary

Dick Grouse ex VK2AZG

Dick passed away on 10th November 2004 in Townsville. He was a keen and active Amateur in the NSW WIA for many years.

Dick and his late wife Hebe VK2AOK, were regulars on the HF bands. His homebrew 60 foot tower and quad on the hill at Marrickville in Sydney was a landmark and was the source of a booming signal around the world.

Apart from Amateur Radio, Dick applied himself to many pursuits and hobbies including chess, bridge, fossicking, and orchids. He was a keen member of the Landrover club. He will be dearly missed by his two daughters Jane and Dia and his two sons Richard and John. All of this family have qualified for and held amateur callsigns at some stage. Jane is not active at present but retains her late mother's call VK2AOK.

The end of an era."

Kan & Jane Duncanson VK4JUD & VK2AOK

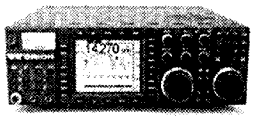
TTS Systems Communications Equipment

TTS Systems

www.ttssystems.com.au

FREE CATALOGUE

Order NOW for deliver



TEN-TEC

ORION

Dual 32-bit floating point ADI SHARC DSP processors Full dual receive capability
Very high RX intercept points
590 receive IF-DSP bandwidth filters independently selectable on each of the main and sub receivers Adjustable receiver tilter shape factors Programmable AGC response time for main receiver True diversity reception using both receivers Continuous real time spectrum display allows monitoring of band activity
"Instant Two Radio Mode" allows ORION to instantly QSY between two different bands
Virtually indestructable 100-watt PA Superb SSB audio is yours at a touch of the AUDIO button

TEN-TEC

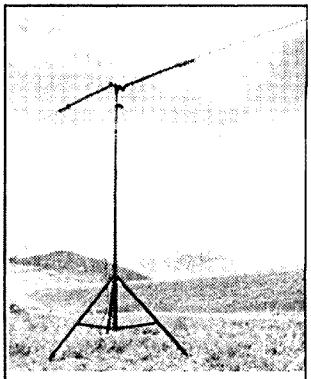
ARGONAUT V

Frequency range: TX: 10-160m + WARC
RX: 0.5-30 MHz
Mode: AM/FM/SSB/CW/AFSK
RF Power output: 1-20 W
Sensitivity: SSB/CW: 0.2-0.35 uV (10 dB SINAD @ 2.4 KHz bandwidth)
AM: 0.5-0.9 uV (10 dB SINAD @ 6 KHz bandwidth)
FM: 0.35-0.6 uV (12 dB SINAD @ 15 KHz bandwidth)
Selectivity: 35 built-in filters SSB/CW: 200-3000 Hz AM: 400-6000 Hz FM: 15 KHz
Image rejection: 80 dB **Voltage:** 13.8 VDC
Current drain: RX: 950-? mA
TX: Max 6 A
Impedance: 50 ohms, SO-239
Dimensions (W*H*D): 216*70*246 mm
Weight: 2.2 Kg
100 memories. Scanning. CTCSS encoder. PSK31-ready. IF-DSP.
"Software defined" radio.

Download new functions from your computer.

LDG ELECTRONICS

Z100 TUNER



Buddipole

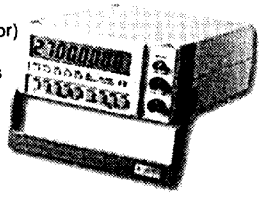
A Complete Portable Antenna System

- The Buddipole Antenna (9 bands, 2 - 40 meters)
- Tripod - extendable legs and locking base
- Portable Mast – extends to 8' in height
- Rotating Arm Kit – change configurations
- Antenna System Bag – padded cordura nylon w/ shoulder strap
- Extra Stainless Steel Telescopic Whip
- 3 extra Coil Clips
- Antenna Operating Manual
- FREE – New 10-page modeling report

Lutron

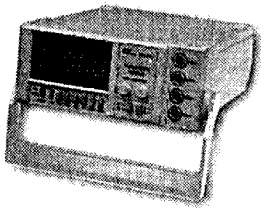
Model FC-2700 – 2.7GHz Frequency Counter
FEATURES

- TCXO (Temp Compensated Crystal Oscillator) Time Base for High Stability & Accuracy
- High Sensitivity for VHF & UHF Frequencies
- Wide Measurement Range to 2.7Hz.
- 8 Digit 18.3mm LCD Display
- Data Hold & Data Record Functions
- 0.1Hz min Resolution on 10MHz Range
- RS232C Serial Output



Model MO-2002 Bench Top Digital Milliohm Meter
FEATURES

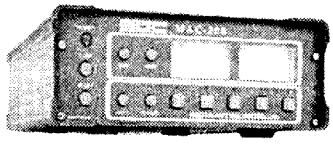
- 3 ½ Digit 20mm LED Display
- 4 terminal device for accurate measurement of very low ohms
- Wide measurement range 0.01mΩ - 20KΩ in 5 ranges
- In Built Input Protection on all ranges
- High Accuracy, Reliability & Durability
- Heavy duty ABS Desk Top Housing



Detailed data sheets available on all Lutron instruments

MAC-200

MASTER ANTENNA CONTROLLER (Smartuner Built-In)



Controls
5 ANTENNAS
3 S0239 COAXIAL CONNECTORS
1 BALANCED ANTENNA OUTPUT
1 END FED LONG WIRE

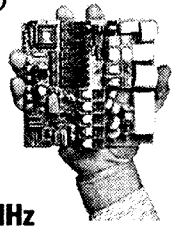
"The box that brought my amateur radio hobby back to life"

SG-237 HF-VHF SMARTUNER®

SGC

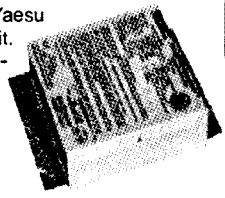
Worlds Smallest High Performance Antenna Coupler
Finished Product or PCB

100 watts
1.8 to 60 MHz



The SG-239 Smartuner™ antenna coupler

With any transceiver get long distance communications. Great results with a longwire antenna or a coaxial fed multi resonant antenna at the unit window, fits many low cost HF transceivers: Scout, Yaesu FT-817, Kenwood TS-50, Icom IC-706, and the K2 kit.
Ideal with the legendary SG-2020 transmitter. Silent receiver tuning or within 1.5 to 200 watts with a high power transceiver. 170 memory bins, independent sensors, inc.VSWR, phase, magnitude, low impedance, and forward sensing.



We have Low Cost instruments for measuring–

- AC/DC Voltage and Current
- AC/DC Power
- Resistance and Insulation
- Light and UV Radiation
- Pressure and Vacuum
- Force and Weight
- Dissolved Oxygen and pH
- Temperature and Humidity
- Conductivity and Moisture
- Sound Level
- Rotating Shaft Speed
- Frequency
- Radioactivity
- Air Flow and Wind Speed
- Vibration

***from* LDG Electronics**
TW–1 Talking Watt-meter
coming soon

VK2 news

Compiled by Tim Mills VK2ZTM.

New Year greetings to all. It is 5 years to go until the centennary of the formation of the Institute at a meeting of concerned Wireless Experimenters at the Hotel Australia in Sydney, early in March 1910. It is also fifty years since the development of the VK2WI site at Dural.

The NSW Division signed the Implementation Agreement with the National WIA at the December council meeting. The NSW Division remains a Company in its own right, having to maintain all the requirements of a Company. This year, as usual, there will be an Annual General Meeting, annual reports and elections to the Board. The expected date of the AGM would be after Easter, sometime in April. Nominations for election will be called late this month or early March. The Division's financial year is the same as the calendar year. It ended on 31st December. By now, all annual reports should have been submitted, ready for publication. AGM material will be sent out to NSW members shortly.

A position became vacant on the Council and this has been filled by the cooption of Owen Holmwood VK2AEJ, for the remainder of this Council year. He has the portfolio of Assistant Secretary, a position he is familiar with, having recently been the Divisional Secretary. He has replaced Adrian Clout VK2BFN.

This month is the annual Central Coast Field Day at the Wyong racecourse on Sunday 20th. The Division will be in attendance and the Deceased Estate section have advised that they will be there with equipment on behalf of recent Estates. The Parramatta office and Bookshop is open 11 am to 2 pm on Tuesday, Thursday and Friday, the first Tuesday night of the month and on the Sunday of the Trash and Treasure days. Contact by telephone 02 9689 2417; FAX 02 9633 1525; Internet vk2wi@wiansw.org.au ; or mail to P. O. Box 9432, Harris Park, 2150.

VK2WI was operated by members of the Dural team on 80 metres on New Years Eve as a "Welcome to 2005". Band conditions were good for a change and over sixty contacts were made in the three hours across midnight. During January, work was carried out on the antenna system on one of the towers. Several old antennas were removed, some of the remainder were changed due to their age and a couple of new ones added. The six metre beacon, VK2RSY, on 52.420 MHz did not make it into the New Year. Still, it had a good innings since it was constructed in the early 1970's. It was decided not to repair it as its replacement was nearing the time when it could go on air. It will be on the new frequency of 50.289 MHz in the CW mode. Work is proceeding to develop replacements for the two metre and seventy centimetre beacons, which were both aged units and are off air. It was discovered recently that the various published frequencies for the 23 cm VK2RWI repeater, had been in error ever since the frequency offset was changed from 12 to 20 MHz. You might like to note that the operating channel is 1273.500 output, with the input 20 MHz higher on 1293.500 MHz. The 160 metre transmission has been restored by diverting the antenna out of and away from trees. This will be a temporary measure until a new antenna is constructed and installed in a better position. The trees grow too fast. The combined Sunday morning news session - at 10 am - with State and National segments is now in place. This required format changes by reducing the length of some of the former contents to fit the time slot. The evening news session continues to use the former format that allows for more detailed news segments. It is transmitted at 7.30 pm Sunday. The VK1WIA segment is only used in the morning. The Hunter Radio Group have resumed their Monday net at 7.30 pm., 3593 kHz and local Newcastle VHF and UHF channels. They include highlights from that week's VK2WI session.

Col VK2TRC retired at the end of 2004 as the compiler and assembler of the VK2WI State news script. He is now devoting some of his 'spare time' to a private enterprise venture. We wish him well and thank him for his past efforts. While his temporary replacement may already be hard at it, we welcome others to join the production team.

Would you like to assist? We need more than one person to cover those times when a break is required and also to share the load. You require access to the Internet, for both the materials passing through the Parramatta office, as well as obtaining stories and items from the web. One also needs to have the ability to send and receive FAX. You need to compile the various items into the script and send it - currently by FAX - to VK2WI by Saturday afternoon. This ensures a safety margin with the transfer, as the script folders are assembled late Saturday. The text is also sent to the Webmaster for inclusion in the Internet news pages. With today's 'modern' communications, you don't have to be in Sydney to perform the task of "News Compiler". Please advise the Parramatta office if you can assist.

There is a request from Brian VK2WBK, who coordinates the NTAC role. He would like all repeater groups to check the entries for their systems in the current callbook. Please send in your updated list to the Parramatta office by one of the contact methods advised above. We would also like Clubs and Groups to send in a current list of meetings and gatherings so that the coming events report in the news sessions reflects correct details. Thank you. Until next month.

73 - Tim VK2ZTM.

VK6 news

Will McGhie VK6UU
will2@iinet.net.au
08 9291 7165

VK6 WIA Division to wind up

As you will know by now the VK6 WIA Division is to wind up. The Special general meeting held on December the 4th 2004 decided the outcome by a large majority; well over the 75% needed under the constitution. The VK6 council will continue in a caretaker role while the National WIA takes over the role. Even though the changes have all been worked through, the mechanism of paying bills, such as Roy's help line phone costs etc, are yet to function. These ongoing bills will now be sent directly to the National WIA. Once the system is fully working the remaining small amount of money held by the VK6 division will be divided between the nominated clubs.

The winding up of the VK6 WIA Division is a time to look forward to the future and to reflect on the history of our local VK6 WIA. I have in my possession the original minutes of the meetings held that started the VK6 Division way back in 1919. The book is a brown paper covered foolscap notebook and on the front is written in ink:

"No 1

Minutes from 24th Nov. 1913 to 26th June 1924.

W.A. Radio Club till June 1916

WIA as from 3rd Nov. 1919."

The VK6 WIA was born out of already existing clubs in VK6. The minute book is largely written in long hand with a nibbed pen by various minute takers over eleven years. It can be difficult to read some of the minutes due to the style used but I will do my best to give you a brief history of the VK6 WIA covered in book 1, 1913 to 1919.

It is important to remember that I have done my best to read and summarise the minutes but do not take these brief notes as accurate history without any fault as there could well be mistakes.

The very first page is titled "W.A Radio Club" and is dated 24th October 13 (1913). It reads:

"A meeting was held at the residence of Mr Sibley North Perth on Monday the 15th inst (instance), for the purpose of forming a Radio – Telegraph Club."

Those present Messrs, McKail, Coxon, Murray, Sibley (2) and Dean

Page one November 1913

To put this into a time frame, this was only 18 years after Marconi, in 1895, began laboratory experiments at his father's country estate at Pontecchio Italy and succeeded in sending wireless signals over a distance of one and a half miles. And 12 years after Marconi in December 1901 transmitted the first wireless signals across the Atlantic between Poldhu, Cornwall, and St. John's, Newfoundland, a distance of 2100 miles.

The W.A. radio Club passed 3 rules:

1. Club to be known as the W.A. Radio Club.
2. The subscription to be 5/- p a in advance
3. Boys attending school will not be accepted, but junior societies may be affiliated.

The Elected Chairman was Mr Ellison. "The secretary was directed to write the Education department asking permission to use the Science class room at PBS (Perth Boys School) for meeting purposes. Also to have notice drawn through the press to the formation of the club."

It is interesting to note that the elected Chairman, Mr Ellison was not present at the meeting, or at least as far as these first minutes reported. Perhaps even way back then people were nominated to positions in their absence.

The use of the Science rooms at PBS was approved by the Honourable Minister for Education.

The newly formed W.A. radio club set about advertising itself in the press and recruiting members from around Western Australia. Remember this was a very new science and bringing together few and far between people interested in spark radio and the wonders of communicating via the ether was as exciting and unknown as it gets. The minutes reflect new members, some called corresponding members who lived great distances from Perth. For all practical purposes radio communications did not exist. These members had an interest in the new science and a radio club was a means of gaining information.

These early minutes mentioned little about radio communications but mainly the running of the club and new members. One item in the minutes dated 30th March 1914 was to write to Messrs Sweeny and Cox asking for a quote for wave meter 50 m upwards. These early meetings usually had a lecturer and, as an example, this meeting on the 30th of March 1914 opened at 8pm "with a lecture on Spark Gaps by Messes Sibley followed by a practice in Morse code."

At the meeting held on 21st June 1914 a name change was made from W.A. Radio Club to W.A. Institute of Radio and Scientific Experimenters to expand the scope of the club.

The last entry for 1914 is for the month of July a month before the beginning of World War One even though lectures had been arranged for August.

The next entry is for 3rd February 1915 and one item is the first indirect mention of WWI. "Move that McKail and secretary interview military department and offer free service of Institute in training members of Signalling Corps in art of Radio – Telegraphy."

Throughout 1915 considerable mention is made about the military with various offers mainly to do with training and information.

At a meeting on 14th February 1916 a motion was passed to shift the direction of the club away from radio due to "Wireless Telegraphy being stagnant on account of the war." A series of lectures were arranged on various topics such as chemistry, photography, astronomy, glass blowing, production of high vacuum and the newest discoveries in science.

State news

The last entry for 1916 was June 12th and mention of people going to war. The very next page is 3 years later, 3rd November 1919. What a world apart the two side-by-side pages are.

This meeting held on 3rd November 1919 was chaired by Professor Ross and a motion was passed to change the name of the club from W.A. Radio Club to The Wireless Institute of Australia Western Australian Division. The reason given was to conform with similar institutions in the Eastern States. Interesting to note that the name change was not from W.A. Institute of Radio and Scientific Experimenters as was reported at the meeting held on 21st June 1914.

So was born The Wireless Institute of Australia Western Australian Division. It is difficult reading from the minutes deciding what the Wireless Institute of Australia was in 1919. Was it just a common name with common ideals or was it more? My opinion was it was just a common name with common ideals, as the hobby was very much in its beginning. There was not even a licensing system, as we know it today.

Next month more from the first minutes of the VK6 WIA division.

VK6 QSL Bureau Report

Here is a summary of the QSL incoming cards for 2004.
By country-number of deliveries- total number of cards recd:

JA - 9 - 3220,	DL - 4 - 2110,	UA - 3 - 1192,	SP - 3 - 490,	OZ - 3 - 75,	SM - 2 - 151,	9A - 2 - 200,	
OE - 2 - 330,	OK - 2 - 463,	ON/PA - 2 - 386,	G - 2 - 239,	YL - 2 - 39,	PY - 2 - 68,	YO - 2 - 12,	
UT - 1 - 165,	9V1 - 2 - 42,	S5 - 1 - 125,	OM - 1 - 92,	YB - 3 - 19,	ZS - 1 - 5,	FK - 1 - 4,	DU - 1 - 5,
XX9 - 1 - 1,	4X4 - 1 - 30,	VR2 - 1- 11,	EI - 1 -9,	I - 1 - 540,	OH - 1 - 156,	VU - 1 - 9,	BV - 1 -29.....

There have been cards received from three VK bureaux, which have been sent to them from overseas countries, which should have been sent here in the first instance. They were no doubt sent to them so as to make up a packet which was economical for them to post, but which cost the VK bureaux money to on-forwarding them.

As there are over 300 countries, and the bureau has received cards from 30 for 2004, there are still a great number which have yet to send cards to the VK6 bureau, and that includes most of the same countries for 2003.

Total number of cards received 11790 for 2004

73 Neil VK6 QSL Bureau

VK4 news

Qnews

Alistair Elrick VK4MV

My apologies for the recent lack of VK4 Notes input to AR, work stress and health defeats all good intentions.

The future of QTC

As Bruce Jones VK4EHT said in the latest QTC magazine, it is planned QTC in its present form will only continue until June 5th 2005. This covers the commitment to those renewing as members of the WIAQ up to June 2004. Though QTC ceases to be published as of July 2005, a page in AR itself will replace the insert in AR. Bruce went on to say it is not the intent to abandon e-mail and posted QTC subscribers. However exact options are still being considered.

VHF a CQ request to boost VHF/UHF SSB DX

The hot and sticky summer months in Queensland are accompanied with good propagation openings on VHF and UHF Bands. Operators are content with just doing the odd DX contact on FM, however according to John VK4AJS and others they are missing out on a much expanded DX world of SSB operation, not to mention the sheer excitement as we heard in the WIA National Broadcast! John reports that he and other operators in Central Queensland have been having good and regular contacts to southern operators. However, even though conditions to the north are more intense and more consistent there are far fewer contacts made mainly because northern operators are reluctant to dip their toes into the world of SSB DX.

John from Yeppoon on the CQ Coast reckons it's time for the northern stations to get game and be keen to join in with the promise of good results! Just look at the fantastic DX on 2 that Felix and Mike work day in day out!

Most of the operators are on air from 5am to 7-30am daily with skeds from Yeppoon southwards to Gladstone, Hervey Bay and Brisbane on Tuesday, Thursday, Saturday and Sunday at 6.50am. The frequencies are 144.1, 432.1 and 1296.1 MHz. If you are nervous about putting your toe into the SSB pond or want tips on how to operate this DX mode then John is eager to hear from you - either by e-mail at vk4ajs@optusnet.com.au or by phone 0412.989.530

SCARC powering on

Harvey Wickes, VK4AHW, the president of the Sunshine Coast Amateur Radio Club is pleased to advise that the club recently took possession of a new 7 kVA Power Generator, valued at over $2,500, compliments of the Caloundra RSL club. As part of its community support program, the Caloundra RSL club generously supports local community groups and organisations. A letter requesting the RSL Club's assistance in providing an Emergency Power Generator for use by the WICEN group at SCARC was considered and approved by their Committee members. On behalf of the members of the Sunshine Coast Amateur Radio Club, we wish to say a big "Thank You" to the RSL, and assure them that the generator will be invaluable as a means of maintaining vital WICEN communications in the event of a cyclone or flood, when power services are often cut.

The TARCinc XMAS

The party happened on Sunday December 19th 2004 attended by 65 operators and support crews - all had a very good time! The Monster Auction run by Wally VK4DO assisted by Don VK4MC enticed many a dB out of the thrifty pockets of attending hams. The venue at the QTH of Tony VK4TJS allowed the treasure to expand from its usual "kilometre" into a "hectare". Test Equipment, Radio Transceivers, Boom Boxes, Cabling and Connectors, the order of the day, Brendan VK4HAX even got a lifetime supply of Midland UHF handhelds for 2 dollars!! Wally and Don did an excellent job getting through all the treasure by 4.30pm. A quick dip in the pool ensued, followed by firing of BBQs and cooking of the evening banquet and the Christmas Pressie Auction. A vote of thanks goes to Tony VK4TJS, for providing such a fantastic venue!

Matters digital

Last week's Queensland Digital Group general meeting was that combined meeting with the SEQATV group where Richard VK4ZAA showed some sound card interfaces and Gary VK4ZA demonstrated his PDA's amateur applications. Bruce VK4TRS has his gateway fully working. DXcluster, convers server and gateway access can now be accessed via any node on the QDG network and some also accessible from VK4TTT on the Gold Coast and VK4PKT in the Logan zone. A number of QDG members have expressed an interest in the HF bands recently. QDG say they will need a hand to test some radio equipment and antenna leading up to next years JOTA, perhaps a regular weekend workshop. For details please contact Richard VK4ZA on 3376 5231. This will be a great boon to JOTA who were somewhat missing south of Mackay this year by all reports to the Q.

VK7 news

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au
Regional Web Site: www.reast.asn.au

Tasmanian Highland Hamfest 2004

On December 4, 2004, the Central Highlands Amateur Radio Club of Tasmania (CHARCT) hosted the Tasmanian Highland Hamfest 2004 and if you missed it then you missed one of the best gatherings of Tasmanian radio enthusiasts in a long time!

It was estimated that about 140 people from all over Tasmania and the mainland made the trip to Miena at the Southern end of the Great Lake in the Central Tasmanian Highlands.

The displays from vendors were very enticing. TTS Systems with a wide range of equipment and accessories including Ten-Tec, SGC, Diamond, Autek and Buddipoles. David Benchoam & Mum were there from Benelec with Yaesu, Revex and Comet equipment including an FT1000 that I believe was sold. The crew from Marcom Watson had a comprehensive display of ICOM equipment including the IC-7800 with a price tag of >$17,000! Apparently there have already been three sold in Australia! TET Emtron and Bushcomm antennas had a great display of antennas and accessories all the way from VK6 and were doing a brisk trade and Solar Tasmania and VK Electronics had a great display of solar equipment including solar cells, batteries and chargers.

Susan, VK7LUV who is the current president of the Australia Ladies Amateur Radio Association and family manned or should I say ladied the ALARA stand and she was deep in conversation with Hamfest attendees each time I went past!

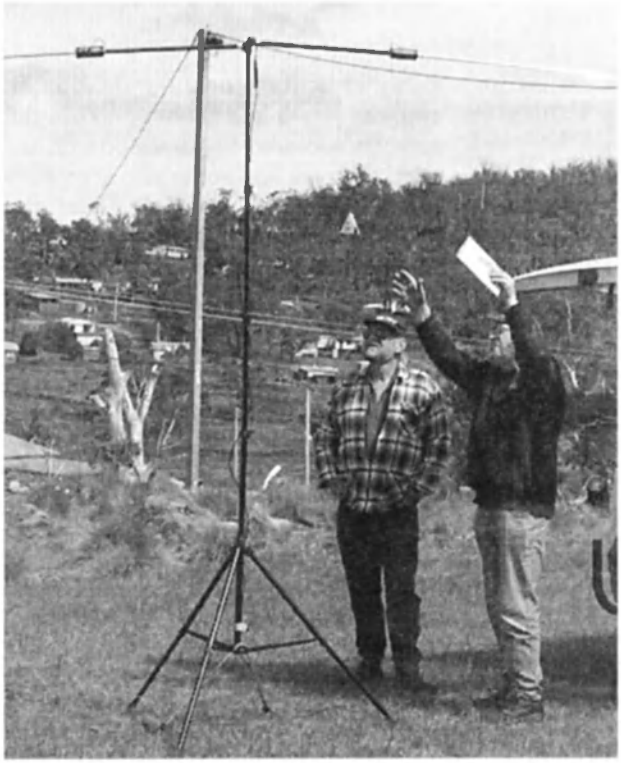
The CHARCT stand was doing a brisk trade in the Hamfest CD-ROMS full of useful software and the buy and sell stands that seemed to be doing a very brisk trade.

Rex, VK7MO had a stand with his meteorscatter-troposcatter station and was demonstrating his weak signal digital techniques. Dick, VK7KVB had a very impressive HF/computer station set up and Brian, VK7KBE had his van

Radio people doing what radio people do best – rag-chewing!

Susan, VK7LUV and family on the ALARA table.

State news



Bryan VK7KBE blessing the Buddipole antenna with VK7PC looking on.

Frenzied buying at the Tasmanian Hamfest buy & sell tables!

set up outside with a HF station and was demonstrating the very portable Buddipole antenna system.

The Radio and Electronics Association of Southern Tasmania was demonstrating 70 cm amateur television and had a number of videos showing the hobby of amateur radio and quite a few new members were signed up.

The raffle of the DSP speaker donated by TTS System was won by Dave, VK7DC and the resonant circuit LC network turned out to be 7.983 MHz and the Bushcomm antenna prize went to Alan, VK7ZAR.

It was great to see many from the CB fraternity and we hope you found that bargain you were looking, struck up a few friendships or found out a little more about what amateur radio can offer.

Many thanks has to go the CHARCT crew especially those people manning the kitchen, lunch was great. Thanks to all for a fantastic day.

Sewing Circle BBQ 2004

On November 14, 2004 about 60 people enjoyed the hospitality of Ken, VK7DY and family on their property at Orielton for the social event of the VK7 amateur calendar, the Sewing Circle "net" BBQ. There was a radio, WLAN demonstration, steam engines, model boats and planes and even how to put a chook to sleep!

The Sewing Circle Trophy went to Franck, VK7CK from Deloraine.

The homebrew competition was won by Dan, VK7DAN for his power supply and Jpole antenna, second prize went to Ken, VK7KRJ for his APRS experimenting and an encouragement award was presented to Hayden, VK7HAY for his Jpole antenna.

The Terry Wilson, VK7HTW, SK award went to Nick, VK7HAF for services to Amateur Radio. Bill, VK7AAW presented his first morse key to Nick with a great story about how he was a Novice in 1983 and at 5wpm made a contact with a VK3 who became a great friend.

The raffle was won by Kevin, VK7KV and the mystery prize of a dozen freshly laid chook eggs was won by Peter Rathbone.

Many positive comments were heard from people finally meeting and putting a face to a name. A great big thank you has to go to Ken, VK7DY, Wendy and his family for making the day a fantastic success.

Northern Tasmanian Amateur Radio Club

The meeting of NTARC on Wednesday, 10th November was well attended and 12 members were presented with their membership certificates. Eight members completed their applications at the meeting and they were presented with their certificates at the Barbeque at Myrtle Park on the 8th of December.

At the conclusion of the meeting, Tony Hart from Centrelink gave a talk on the advantages and disadvantages assets can have on various payments from Centrelink.

After Tony's talk, our President Al,

Kevin, VK7KV (raffle winner), Ken, VK7DY and Chris (US Army Engineer and raffle scrutineer).

VK7AN bestowed life membership of the Club on Joe, VK7JG for all his past work on behalf of amateurs throughout Tasmania and in the North in particular.

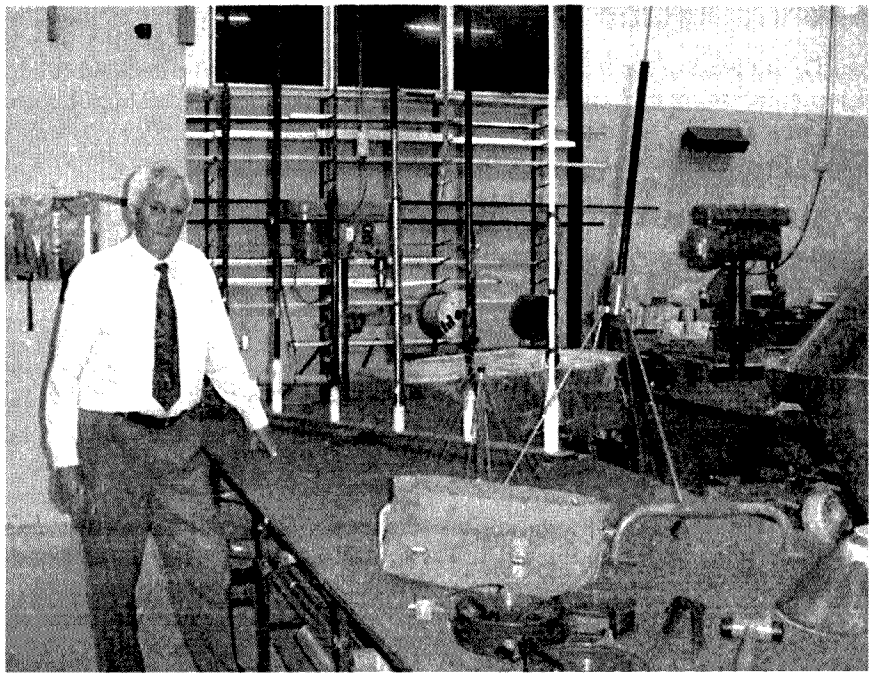
Radio and Electronics Association of Southern Tasmania Inc.

On Wednesday 1st December, 2004 a group of about 35 people attended the Moonraker antenna manufacturing facility at Technopark in Hobart. It was great to see so many from the CB fraternity come along for the visit.

Our host for the evening was Chris Edwards, Managing Director, who is the son of the late Len Edwards, VK7LE who started the company back in the 1960s. Many people in the group remembered Len and his converted service station in Lindisfarne.

Moonraker has about 20 staff and undertakes all their own design and research and development and exports 50% of their products to over 30 countries. They aim for niche markets with a high value product, including military and naval antenna systems.

Chris went on to show us a sample of some of their products that included - near vertical incidence skywave antenna systems, wire loop antenna used by the Russian Army and a portable surveillance antenna used by the British Army in Afghanistan. Danny, VK7HDM an employee of Moonraker gave us an demonstration of the new HF auto-tunable verticals in the test shed.



Chris Edwards next to a sample of the antennas that Moonraker manufacture.

Thanks have to go to Chris, Danny, and staff for allowing us to visit and for putting on a very informative night. It's great to see a Tasmanian technology company successfully competing on the world stage.

Reminder the next meeting is the Annual General Meeting on 2nd February 2005, 8pm at the Domain clubrooms. Of course, don't forget the Wednesday afternoon social gatherings from 1200-1600 every Wednesday at the Domain.

ar

Silent key

Don Bottle SWL

It is with great sadness that I have to inform you of the passing of Don Bottle on 30th November 2004.

Some would wonder who Don Bottle was? Don belonged to the Masonic club and shooting club and was very handy with a camera, but, what Don was best known for was his hobby as a shortwave listener. He never missed an evening with the Sewing Circle, or a Thursday night with the Central Highlands club, ask him who belonged to a VK7 callsign and he could tell you and many other calls around the world.

Don loved his weatherfax and SSTV among other modes, didn't believe in IRLP, Echolink and thought JOTA should stick with radios, antennas and packet and stay off the internet, that was Don, he just loved to help people.

He had one of those memories where he never forgot anything. He wasn't unknown to pick up the phone and report on your signal, good or bad.

I'll miss you Don, sitting in here giving us heaps about how it all should be done!

Vale, Don.

(Dale, VK7NDH)

State news

Canberra Region Amateur Radio Club Inc

The ACT Division of the federated WIA ceased to exist, in a formal or legal sense, when on 17 December 2004 the ACT Registrar-General issued a new Certificate of Incorporation approving the name change from the "WIA ACT Division" to the "Canberra Region Amateur Radio Club". At the same time as applying for the formal name change, the opportunity was taken to update the "Objects and Rules" to reflect the new club name, to remove the prior references to "Federal" functions and to reflect some minor changes to the Club's aims.

The old WIA ACT Division website is being updated and information on club events, membership etc can be found on the CRARC website. At present the safest link to the CRARC website is from the Club's links on the WIA website. From time to time more important matters, or those of wider interest, will be reported under the "Club Notes" in Amateur Radio.

Most of the members of a radio club that previously operated as the "Canberra Amateur Radio Club" have now joined the CRARC and have decided to close their organisation. As part of that process they have generously offered their logo and call sign to the new CRARC. Work is in hand to produce new logo artwork and the need for a second club callsign is being assessed.

During 2004 an extensive email newsletter was trialled in lieu of a weekly broadcast which had become difficult to maintain given the demands on members' time and the acceptance of the computing as a genuine facet of the amateur radio hobby. It is also used to advise recipients of equipment disposals. The email newsletter is now regularly sent to 183 recipients and is available on request to <president@vk1.ampr.org> or broadcast@vk1.ampr.org

The CRARC has advised the national WIA that it will continue as the sponsor of the VK1 Award, with a new award certificate based on the new CRARC logo. A regular net on 3570 KHz will operate each Sunday evening at 8.00 pm local Canberra time.

ar

Club news

IRLP Contest

The Bass Amateur Radio IRLP Group in a joint venture with an American Club are currently putting together an IRLP contest.

What is required from IRLP Operators and Node Owners is there ideas for such a contest. The B.A.R.IRLP.G. has a sponsor who will donate a trophy every year to the winner.

The US side will manage the contest. The Australian sponsor has asked the Group with the joint venture club out of America to put it all together.

Remembering that it will be for IRLP only and no other modes.

So as not to have any delays to your replies please send them in by the end of February 2005 to

The Bass Amateur Radio IRLP Group
PO Box 2280
Rosebud Plaza
Rosebud. Victoria. 3939
Australia
contact node 6391 or 4865
email: IRLPcontest@bassirlp.cjb.net

PLAN AHEAD:

Harry Angel Sprint

22 April

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

In December we had our usual, very pleasant Christmas Dinner at the Blackwood RSL Club at which among other activities, the Denis Grieg Award to the amateur of the year was made.

This year the trophy was presented to Bryan VK5SV, who has decided to retire as Treasurer after serving in that capacity for almost 20 years. He was probably the only person surprised by the award. All those at the dinner considered it was very well deserved. Congratulations Bryan, we hope to see you at the club for many more years even if someone else will be sitting at your table, taking the money!

AHARS holds another social meeting in February as we are unable to use the school premises during school holidays, but normal and interesting meetings will be resumed in February. Any amateur visiting Adelaide on the third Thursday of the month is welcome at the Blackwood High School at 7.30. A call on a local repeater is almost sure to give you any more information you need.

Bryan VK5SV with the Denis Grieg trophy

There were a number of members of AHARS at the wind-up dinner for the WIA(SANT Div), held early in December at which two Certificates of Appreciation were presented by the new WIA president, Michael Owen.

The certificates were presented to two men who have served the amateur community as teachers to those wishing to become amateurs, for many many years: Frank Holsten VK5LK and Geoff VK5TY, who also is President of AHARS. Both were worthy recipients of the recognition because they both have been and continue to be teachers who are responsible for many of the VK amateurs.

Congratulations to you both.

Urunga Radio Convention – March 26 & 27

Well it's coming up to that time of the year where preparations are in hand for the next "Urunga Radio Convention" "The home of fox hunting", This year we welcome all to "Urunga". We have upgraded our foxes (replaced the steam driven ones), and endeavoured to keep the interest in the events by adding or changing hunts to keep up with the times. Events for juniors both days.

Visit our web page for historic and new photos, from the start of the convention in 1949 to today. http://www4.tpgi.com.au/goldy2/ or any search engine.

The Urunga Convention is held at Easter each year on the Saturday and Sunday, every one is welcome. It's held in the Senior Citizens hall in Bowra Street Urunga. There is plenty of accommodation available, such as caravan parks, motels, and the Ocean View Hotel where many of the old conventions where held, the old trophies are still on display there when not displayed at the convention.

There are two full days of Fox Hunts,

Fox found.

Cameron Williams "broken sniffer"

Adam Scammell VK3YDF Brian Ackerly VK3YNG overall winners
Stefan Winkler Junior Winner, Arnold Austin VK2ADA

both pedestrian and mobile, also junior events on both days. You get to see a lot of Urunga. There are also quizzes, competitions, raffles, door prizes etc. Tables are available for trade displays, old gear, second hand equipment etc. Free tea and coffee available all week end for those registered.

There is a comfortable lounge area available for those that want to relax away from the activities.

Ken Golden VK2DGT
sec. WIA Urunga Radio Convention INC.
Email krgolden46@hotmail.com

Saturday night dinner
Bowling Club

Urunga Convention 2004

FOX Hunt Results

Saturday:

3.5 MHz mobile	1st Adam Scammell VK3YDF
2 metre pedestrian	1st VK3YNG Bryan Ackerley
	2nd Adam Scammell VK3YDF
2 metre mobile	1st non event
2 metre talkin mobile	1st Adam Scammell VK3YDF
	2nd Brian Linsley VK2BI

Sunday:

Urunga Scramble	1st Steve Latham VK2BGL
40 metre fun event	1st Rodney Sommerville
2 metre mobile	1st Adam Scammell VK3YDF
	2nd Ken Golden VK2DGT
2 metre pedestrian	1st Brian Ackerly VK3YNG
	2nd Adammell Scammell VK3YDF
2 metre talkin ped.	1st Stefan Winkler
Jack Gerard Memorial Award:	1st Adam Scammell VK3YDF 3 events
Brian Slarke Memorial Award	1st Adam Scammell VK3YDF

Overall for 2 days

Saturday:

Junior 80 metre	1st Mitchell Guest
	2nd Mathew Linsley

Sunday:

Junior 80 metre	1st Stefan Winkler
	2nd Bhoni Austin

ar

DXCC listings as at 31 December 2004

Callsign	Countries
Honour Roll(326)Phone	***General listing-Phone***
VK5MS	335/389
VK4LC	335/382
VE6VK	335/372
VK4UA	335/370
VK5WO	335/368
VK6LK	335/360
VK3AMK	335/354
VK3QI	335/349
VK3AKK	335/348
VK2FGI	335/341
VK3DYL	335/341
VK3EW	335/341
VK3SX	335/341
VK6NE	333/349
VK2AVZ	333/344
VK1ZL	333/339
VK6HD	332/358
VK2DEJ	332/338
VK3OT	331/345
VK4OH	330/337
VK6APK	330/335
VK4AAR	330/334
CT1EEN	330/000
VK3CSR	329/338
VK3YJ	327/333
General listing-Phone	
VK5FV	325/328
VK4SJ	325/326
VK7BC	324/329
EA3AKN	323/331
VK3EUZ	323/324
VK6ABS	321/000
VK4LV	319/321
VK1TX	319/000
VK2UK	315/320
VK6RO	312/319
VK3JI	310/325
VK6LC	310/313
VK4ICU	303/305
VK3IR	302/306
VK6DY	297/301
JA3EY	296/300
VK4EJ	296/298
VK2CSZ	290/293
VK2HV	288/000
VK4BAY	287/290
VK7TS	285/286
9V1RH	283/285
VK6ANC	279/283
VK3DP	274/277
VK3DBQ	272/275
VK2CA	271/000
VK3UY	264/266
VK3VQ	261/278
JA7MGP	260/000
VK2XH	257/000
VK3JMB	255/000
VK8NSB	255/000

Callsign	Countries
Honour Roll(326)CW	***General listing-Open***
VK3CIM	254/258
VK8DK	253/254
VK2FHN	243/000
VK4AO	240/000
VK8KTC	231/233
PY2DBU	228/229
UA6LDD	225/226
VK8AM	225/000
VK4IL	212/000
VK3DVT	206/209
VK6BH	200/000
VK6RZ	187/190
VK7JAB	186/000
G0VXX	184/000
VK6EH	170/000
VK2EJK	169/000
VK4CHB	167/168
VK2BQS	166/169
VK5EMI	160/000
VK2JAU	160/000
VK4ARB	159/160
JA6KTY	156/000
VK2GSN	152/000
VK6HZ	151/000
VK7LUV	148/000
VK2SPS	143/145
VK2QV	141/000
VK3JXO	141/000
VK8LC	137/000
OK1ZSV	136/000
VK3DQ	133/147
SV1XV	130/131
VK4FNQ	130/000
VK4VIS	127/129
VK5ATU	126/128
VK2IRP	125/101
TG8NE	125/000
VK2VZQ	122/000
VK4EZ	119/125
VK2MH	116/118
VK5UO	112/115
VK3CML	109/000
VK3MRG	108/000
AX4EJ	105/000
SV1EOS	105/000
VK9RS	104/000
3W2LC	102/000
SV1FTY	102/000
SV1GYG	102/000
VK3PA	102/000
VK6ISL	102/000
VK2EJM	101/103
VK3KTO	101/102
VK1PRG	101/000
HS1NGR	101/000
CU3AAT	100/000
VK5JAZ	100/000

Callsign	Countries
VK3QI	334/346
VK6HD	333/354
VK5WO	331/347
VE6VK	326/353
General listing -CW	
VK6RZ	315/320
VK3AKK	312/317
VK3KS	307/335
VK4LV	299/306
VK4ICU	291/000
VK3JI	274/299
VK6MK	249/252
VK7BC	246/255
VK2CWS	245/247
VK3DP	245/247
VK4DA	237/239
VK3CIM	235/236
VK3DQ	234/261
RD3AF	233/000
VK7TS	219/000
IK1ZOD	210/000
DL7PA	203/000
VK6RO	193/195
VK4CXQ	174/000
VK5UO	171/172
DK6AP	168/000
VK4UA	151/164
VK3DBQ	150/000
VK4AAR	144/146
VK8AM	138/000
N0TM	135/000
VK7DQ	131/132
DL6UGF	126/000
K5QNM	110/113
VK5BWW	110/113
SM6GZN	110/111
PY2DBU	108/111
T94VT	108/000
UR5BCJ	103/105
Honour Roll (326) Open	
VK4LC	335/382
VE6VK	335/380
VK4UA	335/372
VK5WO	335/372
VK3AMK	335/354
VK3QI	335/350
VK3AKK	335/348
VK3EW	335/341
VK3OT	334/348
VK7BC	334/343
VK6HD	333/360
VK2AVZ	333/344
VK3UY	333/336
VK4AAR	332/336
VK2UK	327/332
VK4LV	323/331
VK6RZ	323/329

Callsign	Countries
VK3JI	322/351
VK6RO	320/327
VK4DV	314/329
VK6LC	312/315
VK4ICU	311/313
VK3DP	305/308
VK7TS	295/296
PY2DBU	294/298
VK2HV	289/000
VK3CIM	284/288
VK6ANC	281/285
VK3DBQ	280/283
UA6LDD	279/280
VK3VQ	276/293
VK3JMB	259/000
VK6MK	256/259
VK8NSB	256/000
VK5UO	251/255
VK2CWS	251/253
VK2FHN	247/000
VK3DQ	246/275
VK4DA	237/239
VK8AM	236/000
VK2BQS	183/186
VK4CXQ	179/000
VK4CHB	177/179
9A4KA	168/000
DL6UGF	161/000
VK5ATU	158/160
VK3VB	153/155
VK6HZ	151/000
VK3JXO	146/000
VK2SPS	144/145
SV1XV	142/144
VK4EZ	140/147
ON9MCR	129/140
VK3OZ	126/127
VK7CQ	123/125
N0MSB	117/000
VK9RS	111/000
VK2AJE	109/000
VK3MRG	109/000
General listing-RTTY	
VK3EBP	253/255
VK3AMK	200/202
VK3DBQ	148/000
VK2BQS	126/128
SP3CUG	124/000
VK5RY	100/102
Gen-listing 6 m. Open	
VK4FNQ	137/000
VK4ABW	109/000
VK6JQ	103/104
VK4CXQ	101/000
Gen-listing-Satellite	
VR2XMT	112/114
VK3XDQ	106/000

The old title of Federal Awards has been changed to "WIA Awards".
"New" to be released in March 2005, "3 & 5 Band DXCC" awards and multi-listing DXCC program.
Awards information and down loadable files are available on our WIA website http://www.wia.org.au/awards/
or email to:awards@wia.org.au or W.I.A. Awards Manager P.O.Box 196. Cannington. Western Australia. 6987.

Mai. VK6LC

AMSAT

Bill Magnusson VK3JT

AO-51 up-link power on 10 m

Many operators have reported that AO-51 seems quite deaf when the 10 metre up-link is switched on. The general comment is that down-link signals are weak despite considerable power being used on 10 metres. Tom Clark W3IWI, one of the driving forces behind AO-51 recently weighed into the debate with this explanation of the configuration of the receive system on board AO-51.

Tom wrote:

"I hope this will clarify the AO-51 ten metre antenna questions. On the "top" of the spacecraft is a single 18" whip antenna fed with semi-rigid 50 ohm coax cable. In the topmost module is a 10 dB off-the-shelf (actually "from my basement" is more correct) Minicircuits ZFDC-series directional coupler that covers (effectively) DC-to-light. The straight-through port of the directional coupler feeds the preamp/power splitter that provides the 2 m uplink facilities. The -10 dB directional coupler tap drives one side of a SPDT coaxial relay, the other side connects to the L-band antenna. The relay arm then drives the "SQRX" receiver (a much modified R-10 ICOM all-mode, all-band handheld scanner) which serves as AO-51's "universal" receiver. If you followed this, you see that the non-resonant whip antenna drives a 50 ohm coupler and receiver and it's not at all surprising that you need a fair amount of transmitter "goo" to make it!"

Thanks for the explanation Tom.

AO-51 switched into store and forward mode for tsunami relief

We've all been appalled by the scale of the natural disaster to our near north and further afield. The AO-51 control team have switched the satellite into digital store and forward mode to facilitate the movement of emergency traffic from the affected areas. All other users have been asked to leave the bulletin board free for this purpose and simply maintain a listening watch on AO-51. At the time of writing I have not seen any emergency traffic but it is early days yet and the drama could be unfolding for months.

AMSAT-NA website re-vamped

If you haven't had a look at the AMSAT-NA web-site recently, you should do so. It's been thoroughly rebuilt and is a credit to those responsible. A very attractive front page leads you to all the essential services that AMSAT-NA and other AMSAT organisations around the globe offer. I have found it to be right up to date and very easy to navigate.

Latest on Keplerian element services

Dr Tom Kelso of "Celestrak" has released his latest update, number-8 on the future availability of Keplerian elements for non-Governmental users - (that's us). He is urging all users to register with a new service called Space Track. You can do this by visiting http://www.space-track.org. Since the announcement was made there has been a lot of discussion generated on the BB on the topic. Many people have had trouble because the element sets as they are downloaded from this new service need some manipulation before they can be used in most of our amateur radio tracking programs. If this situation is resolved by next month's deadline I'll devote some time to it. At the time of writing, Tom's Celestrak keplerian element service is still available and working as normal.

Latest on PCSAT2

Bob Bruninga has appealed for help in monitoring the telemetry on PCSAT2 when it is launched later this year. He wrote "When PCSAT2 is launched in May, we will need some dedicated 9600 baud downlink stations scattered around the world to capture the telemetry during passes and hopefully feed it live via the internet. Or maybe if that doesn't work, to email us a copy every few days. If you are interested in committing to this project, let me know". This would be a most interesting project for those with a permanent internet connection and an automated satellite station. Even if you could monitor the occasional pass and forward the resulting file to Bob via e-mail I'm sure he would be grateful. No doubt we'll hear more of this as the launch date approaches.

Latest six-monthly status update of amateur radio satellites

AO-51 ECHO Catalogue number: 28375

Launch date: June 29, 2004

Status: operational but still testing and commissioning.

Current Mode: PBBS 9K6

Downlink: 435.150 MHz, FM 9600 baud PacSat broadcast Protocol (PBBS)

Uplink: 145.860 MHz FM, 9600 baud PacSat broadcast Protocol (PBBS) Analog voice downlink: 435.300 MHz FM

Analog voice uplink: 145.920 MHz FM 67Hz PL tone

1268.700 MHz FM 67Hz PL tone

Digital Downlinks: 435.150 MHz FM, 38k4 Digital, PBP, 1 watt output

2401.200 MHz FM 38k4 bps, AX.25

Digital Uplink: 145.860 MHz FM, 9k6 Digital, Pacsat Broadcast Protocol (PBP)

Broadcast Callsign: PACB-11

BBS Callsign: PACB-12

International Space Station (ISS) - ARISS

Catalogue number: 25544

Launch date: November 20, 1998

Status: Operational

Current Mode: Packet

Digipeater: Active

Worldwide packet uplink: 145.990 MHz FM

Region 1 voice uplink: 145.200 MHz FM

Region 2/3 voice uplink: 144.490 MHz FM

Worldwide downlink: 145.800 MHz FM

Repeater Uplink: 437.800 MHz FM

Repeater Downlink: 145.800 MHz FM

Russian callsigns RS0ISS, RZ3DZR

USA callsign NA1SS

Packet station mailbox callsign RS0ISS-11

Packet station keyboard callsign RS0ISS-3

Digipeater callsign ARISS

To work out the best times to find someone at the microphone, the ISS daily crew schedule can be found at: http://spaceflight.nasa.gov/station/timelines/

Remember that the crew operates on UTC time.

AO-7 AMSAT OSCAR 7

Catalogue number: 07530

Launch Date: November 15, 1974

Status: Semi-operational in sunlight.

Return to active status: June 21,2002

Uplink: 145.850 to 145.950 MHz CW/USB Mode A

432.125 to 432.175 MHz CW/LSB Mode B

Downlink: 29.400 to 29.500 MHz CW/USB Mode A

145.975 to 145.925 MHz CW/USB Mode B

Beacon: 29.502 MHz, 145.972 MHz, 435.1 MHz, 2304.1 MHz

FO-29 JAS-2

Catalogue number: 24278

Launch Date: August 17, 1996

Status: Operational

Voice/CW Mode JA

Uplink: 145.90 to 146.00 MHz CW/LSB

Downlink: 435.80 to 435.90 MHz CW/USB

Beacon: 435.795 MHz

Digital Mode JD

Uplink: 145.850 145.870 145.910 MHz FM

Downlink: 435.910 MHz 1200-baud BPSK or 9600-baud FSK

Callsign: 8J1JCS

Digitalker: 435.910 MHz

SO-50 SAUDISAT-1C

Catalogue number: 27607

Launched: December 20, 2002

Status: Operational.

Uplink: 145.850 MHz (67.0 Hz PL tone)

Downlink: 436.795 MHz (possibly 5kHz high)

To switch the transmitter on, you need to send a CTCSS tone of 74.4 Hz.

The order of operation is thus: (allow for Doppler as necessary)

1) Transmit on 145.850 MHz with a tone of 74.4 Hz to arm the 10 minute timer on board the spacecraft.

2) Now transmit on 145.850 MHz (FM Voice) using 67.0 Hz to PT the repeater on and off within the 10 Minute window.

3) Sending the 74.4 tone again within the 10 minute window will reset the 10 minute timer.

UO-11 OSCAR-11

Catalogue number: 14781

Launched: March 1, 1984

Status: Semi-operational.

Downlink: 145.826 MHz FM (1200-baud AFSK)

Mode-S Beacon: 2401.500 MHz

More information on UO-11 OSCAR-11 can be found at:

http://www.users.zetnet.co.uk/clivew/

AO-16 PACSAT

Catalogue number: 20439

Launch Date: January 22, 1990

Status: Semi-operational, the digipeater command is on and open for

APRS users.

Uplink: 145.90 145.92 145.94 145.96 MHz FM

(using 1200-baud Manchester FSK)

Downlink: 437.026 MHz SSB (1200-baud PSK)

Mode-S Beacon: 2401.1428 MHz

Broadcast Callsign: PACSAT-11

BBS: PACSAT-12

GO-32 TECHSAT-1B

Catalogue number: 25397

Launch Date: July 10, 1998

Status: Operational but signal weak and subject to deep fading

Downlink: 435.225 MHz FM (9600-baud FSK)

Uplinks: 145.850, 145.890, 145.930 FM

1269.700, 1269.800, 1269.900 FM

Broadcast Callsign: 4XTECH-11

BBS Callsign: 4XTECH-12

NO-44 PCSAT

Catalogue number: 26931

Launch Date: September 30, 2001

Status: Operational but has passed its use-by date

Uplink/downlink: 145.827 MHz 1200 baud AX.25 AFSK via W3ADO-1

Aux/Uplink: 435.250 MHz 9600 baud via PCSAT-2 (off)

APRS Downlink: 144.390 MHz (Region 2)

The following, sadly rather long, list names the amateur radio satellites which are in orbit but are non-operational over VK-ZL at this time.

The list is included here because a number (like AO-10 for example) are possibly experiencing temporary failure due to battery problems when in eclipse. The experience with AO-7 may inspire you to keep a listening watch on the downlink frequencies of these birds in the hope of hearing something. Who knows? You may be the first to report an old satellite springing into life again.

AO-10	NO-45
AO-27 is operational but is not switched on in the southern hemisphere	POSAT-1
	PO-34
	RS-12
	RS-13
AO-40	RS-15
AO-49	SAPPHIRE
CUTE-1	SO-33
FO-20	SO-35
IO-26	SO-41
KO-23	SO-42
KO-25	UO-14
LO-19	UO-22
MO-46	UO-36

Above information courtesy of the AMSAT-NA News Service which is available to all who have ISP access by way of the AMSAT-NA web-site, www.amsat.org.

ar

The AMSAT group in Australia.

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net.

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600 UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

Beyond our shores

David A. Pilley VK2AYD
Davpil@midcoast.com.au

Tsunami disaster

Although not publicised much in the national press, amateur radio has played a very important part in the disaster rescue operations, providing communications where no other means was possible. In time, we will no doubt have a full report on the many contributions made by the Radio Amateur fraternity. Many stations monitored the active rescue frequencies, especially around 14,195 and 21,295 kHz and were prepared to offer assistance. It was great to see the discipline by those that kept the frequencies clear. It wasn't just voice communications. PSK31, Packet and CW were involved as well as Echolink. Yes, CW! Every radio amateur should learn it. Here is an example of its need and contribution. Here in Australia Gavin, VK4ZZ, WIA Media co-ordinator and Ken VK4KF who was co-ordinating Queensland kept us up to date by email. There were lots of stations that need praise for their efforts, such as Dr. Sarath, 4S7SW, who operated from the Marthara Hospital in Sri Lanka. There are so many radio amateurs that have given help and I hope they will all be recognised in time.

Permanent ISS ham station

Human crews share fourth anniversary

Four years ago, (November 2) the Expedition 1 crew arrived aboard the International Space Station, home of the first permanent Amateur Radio station in space. Just weeks earlier, the FCC granted the station's distinctive NA1SS call sign. By the time William Shepherd, KD5GSL, Sergei Krikalev, U5MIR, and Yuri Gidzenko arrived on November 2, 2000, the Phase 1 or "initial station" Amateur Radio on the International Space Station (ARISS) gear was already on board for the crew to install. Crew increments comprising US astronauts and Russian cosmonauts have rotated duty tours continuously ever since, and ham radio has played a role in each crew's routine.

"Every challenge for the International Space Station crews, flight control teams and management adds to the knowledge base we need to develop longer spaceflight missions to places like the moon and Mars," said International Space Station Program Manager Bill Gerstenmaier. "The work we're doing on station is directly connected to future exploration missions." ARISS International currently is mulling Amateur Radio's role in NASA's "Moon, Mars and Beyond" initiative.

With NASA's shuttle fleet now grounded, crew increments have shrunk to two people, while duty tours have stretched from four to six months. Despite fewer hands on deck, NASA says the two-person crews sometimes have been able to do more with less--often improvising.

The Expedition 10 crew of Commander Leroy Chiao, KE5BRW, and ISS Flight Engineer Salizhan Sharipov, arrived at the ISS just last month--aboard a Russian Soyuz vehicle, just as the Expedition 1 crew did, although other crews travelled via the shuttle. Over the years, in addition to visiting space shuttle crews, there have even been a couple of paying "space tourists" and other short-term visitors who took advantage of the ARISS gear onboard. More recently, Russian Space Forces Test Cosmonaut Yuri Shargin--who arrived with the Expedition 10 crew--completed two ARISS contacts with school groups in Europe.

The Expedition 10 crew is not expected to begin its own series of school group contacts until the week of November 15 at the earliest. Unscheduled ham radio activity by crew members typically is suspended during crew changeover periods. As of November 4, the NA1SS FM voice repeater remained off and the ARISS Phase 2 equipment was back in packet mode under the RS0ISS call sign.

Chiao cast his vote in the November 2 presidential election while orbiting 230 miles above Earth. A law the Texas State Legislature passed in 1997 allows astronauts to vote electronically from space. Chiao submitted his electronic ballot to his county clerk's office via e-mail.

Some statistics: Since the Expedition 1 crew carried out the first successful ARISS school group contact--with Luther Burbank Elementary School near Chicago on December 21, 2000--ISS crews have racked up 150 similar Amateur Radio contacts. Approximately two-thirds of them have been direct, 2-metre QSOs, while the rest were carried out via "telebridge" stations, where two-way audio was teleconferenced to the school via an Earth station convenient to QSO NA1SS directly.

The crew holding the record for the most ARISS school group contacts was Expedition 3. Commander Frank Culbertson, KD5OPQ, answered questions via ham radio posed by students at 22 different schools. Culbertson also activated NA1SS during the 2001 Jamboree On The Air (JOTA) scouting event.

NASA recently announced that after an extensive review, it's planning its return-to-flight shuttle mission, STS-114, for a launch window that opens next May. ARISS International Chairman Frank Bauer, KA3HDO, says PCSat 2, an externally mounted ham radio payload, is expected to fly on that shuttle flight, which also will mark the return of three-person ISS crews. "We will also be able to better negotiate the delivery of our computer, which is essential for the SSTV system," Bauer added. Some information from NASA.

(ARRL N/L 23/44)

Israel to drop CW requirement

Back on Earth, word is that the state of Israel may be the next nation to do away with Morse testing. At least the possibility has been raised in the latest issue of the Israel Amateur Radio Club's English language publication Hagal International.

In a brief statement in the latest on-line edition, the magazine says that a proposal to abandon Morse testing has been raised by the nation's Ministry of Communications. The publication notes that many European countries have been dropping the Morse requirement and that it expects to see a rather heated discussion among Israeli hams once the

Frederick Bernard Freer VK2GAE

1916 - 2004

Many will be saddened to hear of Fred's death on the 5 September 2004 at West Kempsey

Fred studied for his Commercial Operator's Certificate of Proficiency at the Marconi School of Wireless, Sydney around 1936. Having obtained this, he joined AWA Ltd's Marine Department and went to sea as a Radio Officer in the Australian Merchant Navy.

Very soon Fred, like many others, found themselves involved in WW2. During this period he served on various ships. The one he remembered best was the m.v.Neptuna. He was in Darwin at the time and had just been transferred to another ship. Just after that, on 19 February 1942, the Japanese raided Darwin and scored two direct hits on the Neptuna which was carrying ammunition, tore her apart, killing the Captain and 45 crew.

After the war, Fred joined Radio Corporation (Astor Radio) Sydney and headed their service department. Some years later he set up his own radio service business, Bonelec, at Bondi. He later moved to Newcastle, still repairing radios and into TV. In 1976 he moved to West Kempsey NSW with the idea of retiring but knowing Fred, he still did some fixing for all his friends. His final piece of work was the restoration of a Weldon console radio.

Twenty years ago, he took up learning to play the electronic organ, his wife Joyce being his tutor. Fred didn't apply for his amateur radio station licence until 1989.

I have to thank Fred a lot. My first job also was at Radio Corporation in 1945 after WW2.

Fred was the boss of the workshop. I was going to go to the Technical College to be a service mechanic. Fred talked me into going to the Marconi School, get my Commercial ticket and go to sea. I did that!

After that I lost contact with Fred for 35 years, found out that he was in Kempsey and paid him a visit. He also talked me into obtaining my amateur station licence in 1997. Since then, until recently, we have had regular Saturday morning HF skeds on 7 MHz.

Our sympathy to Fred's family and to Joyce. He will be missed.

Ted Miles VK2FLB

Beyond our shores *continued*

Ministry opens the debate for public discussion.

At the moment Israel maintains a 5 word per minute Morse testing requirement for access to the High Frequency bands. But it is also a signatory to the pan-European CEPT licensing agreement and tends to abide by whatever regulations CEPT adopts for its member nations.

More on what's happening in Israeli ham radio is on line at www.iarc.org (Hagal International)

(ARNewsline)

Iraq

Open Echolink node in Baghdad

Ian Abel, G3ZHI, reports that an Echolink node is now on the air in Iraq. Its call sign is YI1IRQ dash l with a node number of 209608. It can be found operating on 144.225 MHz and covers most of the city of Baghdad.

(ARNewsline)

Great Britain

5 MHz beacons on air

The Radio Society of Great Britain says the two new beacons on 5290 kHz are now active. The new beacons operate under the callsigns GB3WES and GB3ORK. GB3WES is located in Cumbria and GB3ORK in the Orkney Islands. Both will have a stepped transmit power sequence and a 30-second sounder sequence of 0.5ms pulses at 40 Hz and identical to that of the Oxfordshire GB3RAL beacon.

The new beacons have transmit times to follow GB3RAL by one and two minutes respectively. Together the three beacons will provide an excellent spread of signal source from across Great Britain and offering experimenters worldwide a unique opportunity to study propagation effects at 5 MHz from their own QTH. Reports are welcome and further information on how to file them is available on the RSGB Spectrum Forum website at www.rsgb-spectrumforum.org.uk/5Mhz.htm

(GB2RS)

U.S.A.

Dayton Ohio

Hamvention 2005 is slated for May 20th to the 22nd at the Hara Arena in the Dayton suburb of Trotwood, Ohio. Time to make your travel plans and book your air ticket now.

Trivia

Emerging technology: 25% of Earth's inhabitants are wireless telephone subscribers

Not amateur radio, but perhaps interesting to those that use hand-held transceivers!

Science On-Line reports that the worldwide population of wireless telephone subscribers in now estimated to be almost 1.5 billion. That's roughly about one quarter of the world's population. Subscribers have doubled in the past five years, and the fastest growth is now occurring in China, India and Russia.

(Science OnLine)

ar

Wadda Cup 2004
And the winner of the old mug is...VK3EK!

Vince Henderson, VK7VH
Contest Manager

The Central Highlands Amateur Radio Club of Tasmania (CHARCT) 2004 80m Dash for the Wadda Cup Contest and trophy has been won by Rob Ashlin, VK3EK. Rob is no stranger to contesting and now counts the Wadda Cup among the growing list of contests that he has conquered. Rob came close to winning the cup in 2002, finishing second. It was also a near miss in 2003, as Rob finished third.

Rob wins the 2004 Wadda Cup trophy, a replica of the trophy (to keep for all time) and first place certificate.

Rob said "I never thought that I had a chance. It was nail-biting stuff waiting for the scores during the call back."

Rob was pleased with the win. "I have been involved with the Central Highlands Amateur Radio Club of Tasmania for many years. They are a great bunch of people and winning the Club's Wadda Cup Contest is a great honour."

Congratulations Rob on a fine win and we look forward to hearing you next year as the on air coordinator and operator of VK7CHT/3.

In second place with a great score of 30 points was Len Steel, VK3FB. Len was only just beaten to the post for first place. Len will receive the Wadda Cup second place certificate. Well done Len.

Third place was won by Frank Clark, VK7CK. In Frank's words "I have been fiddling around with radio for the last 20 years. I am most pleased with my result and I hope to have a go next year." Frank will receive the third place certificate. Congratulations Frank.

The Short Wave Listener part of the event may have had participants but no logs were received. We hope that this will not be the case next year and while it is disappointing that no SWL entries were received, we will continue this section of the Wadda Cup Contest.

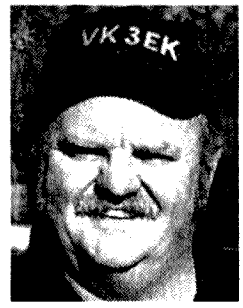
The contest was held on Saturday evening, 23 October 2004. Conditions during the contest were generally very good. Most operators were receiving strong signals. There were some steady static crashes during the event and this made contact between distant stations a little difficult. The pace during the first half hour of the contest was fast and furious. Finding stations during the last half hour was a little more difficult. The event is meant to be friendly and fun. It turned out to be just that as many people commented that the Wadda Cup Contest is their favourite event, full of friendly people and heaps of fun.

The contest call back was held on 3.585 MHz immediately after the contest concluded. It was very well supported, considering the number of stations that participated in the score roll call. There were many stations, making just a few contacts, who did not participate in the call back. We thank them for joining in the contest. If you do have a go at the 2005 contest, even if you make just a few contacts, we encourage all stations to give their score during the on air score call back. The score call back is unique to the Wadda Cup Contest and as far as we know, it is the only contest in the world that has this type of format.

VK7CHT/5 (CHARCT club call sign) was operated by Tom Aubrey, VK5EE. Tom stood in for Kevin Johnston, VK5KJ, the winner of the 2003 event, operating the club call of VK5SR. Unfortunately Kevin had a last minute engagement and we thank Tom for stepping in to operate the CHARCT call sign on behalf of Kevin.

We also thank Tom Aubrey and Paul Linsley, VK2BPL, for their relay assistance during the contest call back. This ensured that we had reasonable coverage, for gathering contest scores, around Australia.

To make sure that The Wadda Cup continues to be on the Australian contest calendar, CHARCT will always encourage comments from participants on how the rules could be improved. A number of suggestions were received after the 2004 event. Some of the changes that may be made to the 2005 event include changing the contest date to mid September. This may overcome some of the static crashes we experienced during the last event. Also, and probably more important, a change to September will make life a little easier for Tasmanian stations. This will make the contest start time the same along the eastern seaboard. No more daylight saving time problems!



Rob Ashlin VK3EK

The 2005 event will also allow for the recording of contacts in local time or UTC. If you have a suggestion, please do not hesitate to send it to the contest manager. Look for all the changes to the 2005 Wadda Cup Contest in the 2005 rules. We expect that the rules will be available on the CHARCT web site (http://charct.net) during February 2005.

To all who took part in the 2004 Wadda Cup Contest, CHARCT says thank you. Your participation is the reason that the event is becoming so popular. To all that missed the contest and are just finding out that a contest can be a fun event, we hope to hear you next year.

Until next year, happy contesting.

ar

2004 Wadda Cup Contest results

VK3EK	32 *	VK3HAP	22
VK3FB	30 **	VK5HBH	22
VK7CK	29 ***	VK2LCD	20
VK7TS	28	VK5KBJ	20
VK3JPP	27	VK7HAR	20
VK3MGZ	26	VK7IL	18
VK2BPL	26	VK5DP	18
VK5SR	26	VK3MMM	16
VK7CHT/5	26	VK3BTV	14
VK7VH	25	VK3ZDR	13
VK7TW	25	VK3UCK	10
VK3HGK	24	VK2BQS	6
		VK2JHN	3

* = 1st place Certificate and Trophy
** = 2nd place Certificate
*** = 3rd place Certificate

Ian Godsil VK3JS

Contest Calendar February - April 2005

5/6	Feb	10-10 Intl. Winter Party	(SSB)
5/6	Feb	Mexico Intl/ RTTY Contest	(RTTY)
12/13	Feb	CQ WW RTTY WPX Contest	(RTTY)
13	Feb	Asia-Pacific Sprint Contest	(CW 20/40m)
26/27	Feb	ARRL Intl. DX Contest	(CW)
26/27	Feb	Russian PSK WW Contest	(PSK31)
26/27	Feb	REF DX Contest	(SSB)
5/6	Mar	ARRL Intl. Contest	(SSB)
12/13	Mar	RSGB Commonwealth Contest	(CW)
19/20	Mar	John Moyle Field Day	(CW/SSB/FM)
19/21	Mar	BARTG HF RTTY Contest	(RTTY)
19/21	Mar	Russian DX Contest	(CW/SSB)
26/27	Mar	CQ WW WPX Contest	(SSB)
9/10	Apr	JA Intl. DX Contest	
22	Apr	Harry Angel Sprint (CW/SSB/FM)	

Greetings to all readers and I hope that you are preparing for a new contest year.

Firstly my apologies for the lateness of the 2003 CQWW results below. They only arrived with me late in November.

I hope that by the time that you read this there will be a complete list of not only Contest events, but other AR activities, posted on the WIA web site. Obviously, the availability of such a list should help clubs to co-ordinate their special events during the year. So, if your Club has planned something for later in the year, but it does not show in the list, please ask someone to get the information to the Federal Web Master for inclusion.

Results 2003 CQ WW CW Contest

(VK only Call\band\score)

VK6AA	All	5,933,760
VK4UC	"	5,880,005
VK4AN	"	1,799,175
VK6DXI	"	1,294,083
VK7GN	"	982,163
VK3IO	"	237,326
VK4BUI	"	46,706
VK4WPX	"	5,151
VK2DPD	"	383,702
VK2KM	"	114,680
VK6HG	"	110,259
VK2AR	"	60,455
VK4TT	"	38,760
VK1BL	"	910
VK6LW	7	610,067
VK4DX	14	304,437
VK2IMM	28	22,936
VK9CJ	All	463,250

Results 2003 CQ WW SSB Contest

(VK only Call\band\score)

VK2IA	All	754,614
VK7GN	"	142,854
VK3IO	"	77,400
VK6HZ	"	69,300
VK4EJ	"	375,320
VK3DBQ	"	18,012
VK8AV	"	14,162
VK6DXI	"	3,698
VK5EMI	"	1,326
VK5UE	"	850
VK1KMB	"	442
VK4WPX	28	107,909
VK4AN	21	211,888
VK4FJ	"	7,920
VK6KK	14	5,184
VK2AAC	"	4,879
VK6LW	7	186,878

Results RD Contest 2004

From Alek VK6APK, Contest Manager

VK6 Premiers in 2004!

For the third year running, the RD Contest trophy has been won by VK6

VK6 is the most isolated of the Australian states and as a result, those who live there have to work just that little bit harder. This was certainly the case for the 2004 RD Contest. There was tremendous enthusiasm and a strong desire to put in a winning effort again this year. Congratulations to all who participated and made the win possible.

As usual, the task of checking logs and collating results was made very easy by the high standards of submitted logs.

Here are the results for the contest.

State Scores

Table 1 shows the placing of each state along with their Overall Scores.

Table 1: State Ladder

1st	VK6	1.449
2nd	VK7	1.077
3rd	VK4	0.743
4th	VK5/8	0.620
5th	VK3	0.499
6th	VK2	0.402
7th	VK1	0.195

The total scores in both HF and VHF are shown in Table 2.

Table 2: State QSO Totals

State	HF	VHF
VK1	228	0
VK2	3025	4
VK3	2422	850
VK4	2047	1429
VK5/8	3047	508
VK6	1676	11908
VK7	1276	1118

For those who wish to know how the "Overall Score" for each division is calculated, I have included the following live example of how it is done. I will use VK3's figures in the calculations. The overall score is the average of both the HF and VHF "Improvement Factors"

Formula:

Improvement Factor = 2004 Points divided by 2004 Benchmark

Calculations:

HF

2422 / 2978 = 0.8133

VHF

850 / 4581 = 0.1855

The two improvement factors are now averaged to give the division's final result.

Formula:

Overall Score = (HF Improvement + VHF Improvement) / 2

Calculation:

Overall Score = (0.8133 + 0.1855) / 2

Overall Score = 0.9988 / 2

Overall Score = 0.499

Here are the Benchmark figures for the year 2005. This table will also appear in the rules for 2005. The formula for determining these values is:

2005 Benchmark = (0.25 x 2004 Score) + (0.75 x 2004 Benchmark)

Once again, using VK3 as an example.

2004 Benchmarks.

(As published in 2003 results and 2004 rules)

HF 2978

VHF 4581

2004 Scores.

HF 2422

VHF 850

Formula:

2005 Benchmark = (0.25 x 2004 Score) + (0.75 x 2004 Benchmark)

Calculations:

HF

2005 Benchmark = (0.25 x 2422) + (0.75 x 2978)

2005 Benchmark = 605.5 + 2233.5

2005 Benchmark = 2839

VHF

2005 Benchmark = (0.25 x 850) + (0.75 x 4581)

2005 Benchmark = 212.5 + 3435.75

2005 Benchmark = 3648

Those 2 benchmark figures are the scores that the state needs to beat, in 2005, to register a positive improvement factor in each section of the contest.

Table 3: 2005 Benchmarks

State	HF	VHF
VK1	497	119
VK2	3688	99
VK3	2839	3648
VK4	2914	1623
VK5/8	3187	1410
VK6	2061	7164
VK7	1507	901

From these Benchmark totals it can be seen that it is quite possible for any state to win next year's contest.

The following table shows the total number of logs received over the last 5 years. * Denotes winning state.

Table 4: Logs

State	2000	2001	2002	2003	2004
VK1	9	15	8	8	3
VK2	41	41*	25	41	40
VK3	137	57	57	43	52
VK4	78*	40	53	76	50
VK5/8	46	51	54	41	45
VK6	59	47	72*	74*	90*
VK7	41	24	27	17	32
Total	411	275	296	300	312

Individual Scores

The individual scores for entrants are listed below. Certificate winners are denoted by an asterisk (*) and the top Australian scores in each section by a hash (#). Multi operator certificate winners are denoted by (M). Certificates will be issued to the top operators in each division as deemed by the contest coordinator. Where a multi operator station holds the top score, a certificate will also be issued to the top scoring single operator in that section. Where a single operator station holds top place, only that station will receive a certificate.

VK1

HF Phone

TMS	14

HF CW

ENG	100*

HF Open

AI	114*

VK2

HF Phone

XZ	317*
XT	185
TS	176
HFM	102
VV	99
DF	75
KUZ	64
ZQX	59
ZEN	51
IRP	45
ASU	43
MB	41
YW	40
ZZF	21
CZ	20
HPM	20
LCD	20
JHN	19
KEA	18
ZRM	16
TWB	13
AYL	12
BT	11
BUI	11
JTV	11
ALV	10

HF CW

GR	122*
BHQ	120
KM	114
EL	90
AWD	54
WL	46
RJ	40
AUC	8

HF Open

BO	313*
BPL	296
AYD	230
YN	94

VHF Phone

TWB	2
ZEN	2

VK3

HF Phone

SY	365*
AHY	154
AVV	BSF
JK	117
EK	106
FDX	102
DET	101
KTO	84
NA	70
AMW	61
JSS	59
BCZ	57
KMB	57
DY	56
SM	50
EA	42
ADW	38
ATN	29
AKT/4	26
HAP	25
AAM	24
HFS	24
IT	13
KCD	12
KQB	11
UBM	9
XH	2

HF CW

ANJ	92*
JS	87
BKU	64
KS	62
AMD	30
GDM	18

HF Open

ACR	47
AQ	26
US	26
ZYG	26

VHF Phone

EA	120*
HFS	97
BBA	96
CH	95
JK	84
XJU	61
XH	42
JS	40
XKU	15
BSF	7

VHF Open

ACR	66*
AQ	43
US	42
ZUG	42

VK4

HF Phone

BAY	199*
WIT	188
ADC	144
FNQ	109
AQD	90
JEW	83
APE	70
BTW	58
XES	49
ZA	35
TE	42
TLB	35
KML	31
ZGQ	31
TKA	28
FU	25
MC	21
PS	21
ACC	20
TJS	15
PJ	14
AA	11
BSH	11
PZ	11
DO	10
GM	10
KJD	7

HF CW

XA	172*#
BUI	108

HF Open

WIL	376*#
GZ	23

VHF Phone

AML	280*
AA	203
JEW	131
ADC	129
ZBV	116
3CE/4	95
ZGQ	72
ZA	67
WIT	65
HSV	59
FNQ	44
TJS	43
APE	39
ZM	20
EV	17
PJ	17
MC	16
BAY	12
TLB	4

VK5/8

HF Phone

AY	419*#
UBC	377
BP	247
BWH	228
KCX	216
DJ	129
YX	115
WO	108
AIC	101
HRW	100
VE	90
SN	83
AIM	80
NN	75
RV	64
KMC	52
ASN	38
OQ	35
TW	35
MX	24
UE	20
ZQ	15
OF	14
TY	12
8ZJZ	11
ZFW	10

HF CW

ATU	148*
UM	94
HO	86

HF Open

RG	21

VHF Phone

MX	74*
UBC	72
AIM	71
ZKK	54
KMC	53
KLD	35
AIC	26
AVQ	26
SE	25
OF	19
YX	17
ATQ	16
AR	12
ZFW	5
OQ	3

VK6

HF Phone

VZ	204*
ADI	149
CSW	138
HZ	127
KK	117
TQ	111
JP	85
BRN	83
CB	79
CG	64
DI	51
APK	50
NU	49
ZN/4	42
AB	25
ND	22
RZ	15
MDS	14
FJA	11
TRA	10
KH	9
EH	4
USB	1

HF CW

AFW	112*
AJ	66

HF Open

NX	38

VHF Phone

XRE	607*#
ZAR	530
ANC	484
JIP	484
ND	484
ZBP	484
XAA	466
CSW	409
NX	392
TVI	324
TNT	322
HST	317
UHF	314
FJA	285
NU	266
KEN	255
AD	229
HU	229
SAA	228
HGR	220
JP	216
XCJ	205
USB	191
IQ	187
TAA	184
BDO	171
SAR	169
TRA	158
KAD	155
SCS	155
SH	155
WI	155
WIA	155
ZKO	152
CX	151
APK	140
KHZ	132
KW	120
BW	101
LZ	97
KWT	87
SMH	78
NCE	70
ACT	64
ARO	64
CRO	64
RO	64
SIX	64
AXB	60
ZLZ	58
APW	53
JRC	53
UT	50
WU	48
YF	48
YJ	48
YGQ	47
ZIC	45
EH	42
OE	33
TS	32
KTN	11
JGF	10
RZ	10

VHF Open

DXI	203*#
HK	24

VK7

HF Phone

GN	373*
CK	275
VH	224
TW	140
KDO	54
RM	39
IF	33
ZGK	30
KC	30
XRN	18
CHT	13
HDM	13
HDX	13
ZJA	11
HAH	10

VHF Phone

ZBX	169*
KDO	131
HAF	121
ZGK	121
RR	113
TW	85
RM	67
HDM	49
DG	47
CHT	43
VH	43
JGD	34
JK	30
KK	30
XRN	19
PP	13
IF	3

Short Wave Listener

Reddam House High School Radio Club 336*#

Overseas

ZL2ADN	HF Phone	31
ZL1ALZ	HF Open	273*

This has been my eleventh year as RD Contest Coordinator. I am happy to say that it has been a great pleasure to do the job for each of those years. The greatest joy each year, has been reading the notes and comments of both old timers and newcomers who had fun in the contest.

In 2005, Chris, VK4AA will take on the role as Contest Coordinator. I wish him well and I'm sure he will tackle the task with great enthusiasm.

73, Alek. VK6APK

John Moyle Field Day Contest 2005

Presented by Denis Johnstone VK3ZUX

19 - 20 March, 2005
0100 UTC Sat– 0059 Sun

Overview

1. The aim is to encourage and provide familiarisation with portable operation, and provide training for emergency situations. The rules are therefore designed to encourage field operation.
2. The contest takes place on the 3rd full weekend in March each year, and runs from 0100 UTC Saturday to 0059 UTC Sunday, 20-21 March, 2004.
3. The contest is open to all VK, ZL and P2 stations. Other stations are welcome to participate, but can only claim points for contacts with VK, ZL and P2 stations.
4. Single operator portable entries shall consist of ONE choice from each of the following (e.g. 6 hour, portable, phone, VHF/UHF):
   a. 24 or 6 hour;
   b. Phone, CW, or All mode;
   c. HF, VHF/UHF or All Band.
5. Multi-operator portable entries shall consist of ONE choice from each of the following (e.g. 24 hour, portable, phone, VHF/UHF):
   a. 24 or 6 hour;
   b. Phone, CW, or All mode;
   c. HF, VHF/UHF or All Band.
6. Home and SWL single operator entries may be either 24 hour or 6 hours, All mode, All band.

Scoring

7. Portable HF stations shall score 2 points per QSO.
8. Portable stations shall score the following on 6m:
   a. 0-49 km, 2 points per QSO;
   b. 50-99 km, 10 points per QSO;
   c. 100-149 km 20 points per QSO;
   d. 150-199 km 30 points per QSO;
   e. 200-499 km 50 points per QSO;
   f. 500 km and greater, 2 points per QSO.
9. Portable stations shall score the following on 144MHz and higher:
   a. 0 to 49 km, 2 points per QSO;
   b. 50 to 99 km, 10 points per QSO;
   c. 100 to 149 km, 20 points per QSO;
   d. 150 km and greater, 30 points per QSO.
10. For each VHF/UHF QSO where more than 2 points is claimed, either the latitude and longitude of the station contacted or other satisfactory proof of distance must be supplied.
11. Home stations shall score:
    a. Two points per QSO with each portable station.
    b. One point per QSO with other home stations.

Log Submission

12. For each contact: UTC time, frequency, station worked, RST/ serial numbers sent / received and claimed score. (VHF and above location of other station and distance.)

Logs must be accompanied by a summary sheet showing: callsign, name, mailing address, section entered, number of contacts, claimed score, location of the station during the contest, and equipment used, and a signed declaration stating "I hereby declare that this station was operated in accordance with the rules and spirit of the contest and that the contest manager's decision will be accepted as final". For multi-operator stations, the names and callsigns (legible) of all operators must be listed.

13. Paper logs may be posted to "John Moyle Contest Manager,

    Alternatively, logs may be e-mailed to: jmfd2004@wia.org.au

    Please submit logs in the following formats ONLY: ASCII text (*.txt), or MS Word (*.doc).

    Logs sent by disc or e-mail must include a summary sheet and declaration, but the operator's name (legible) is acceptable in lieu of a signature.

    Logs must be postmarked no later than 29 April, 2005

Certificates and Trophy

14. At the discretion of the Contest Manager, certificates will be awarded to the winners of each portable section. Additional certificates may be awarded where operation merits it. Note that entrants in a 24 hour section are ineligible for awards in a 6 hour section.
15. The Australian portable station, CW section, with the highest CW score will be awarded the President's Cup, a perpetual trophy held at the National Office, and will receive an individually inscribed wall plaque as permanent recognition.

Disqualification

16. General WIA contest disqualification criteria, as published in Amateur Radio from time to time, apply to entries in this contest. Logs which are illegible or excessively untidy are also liable to be disqualified.

Definitions

17. A portable station comprises field equipment operating from a power source, e.g. batteries, portable generator, solar power, wind power, independent of any permanent facilities, which is not the normal location of any amateur station.
18. All equipment comprising the portable station must be located within an 800 m diameter circle.
19. A single operator station is where one person performs all operating, logging, and spotting functions.
20. A single operator may only use a callsign of which he/she is the official holder. A single operator may not use a callsign belonging to any group, club or organisation for which he/she is a sponsor except as part of a multioperator entry.
21. A multioperator station is where more than one person operates, checks for duplicates, keeps the log, performs spotting, etc.
22. A multioperator station may use only one callsign during the contest.
23. Multioperator stations may only use one transmitter on each band

at any one time, regardless of the mode in use.

24. Multioperator stations must use a separate log for each band.
25. A station operated by a club, group, or organisation will be considered to be multioperator by default.
26. None of the portable field equipment may be erected on the site earlier than 28 hours before the beginning of the contest.
27. Single operator stations may receive moderate assistance prior to and during the contest, except for operating, logging and spotting. The practice of clubs or groups providing massive logistic support to a single operator is, however, totally against the spirit of the contest. Offenders will be disqualified, and at the discretion of the manager, may be banned from further participation in the contest for a period of up to 3 years.
28. Phone includes SSB, AM and FM.
29. CW includes CW, RTTY, and packet.
30. It is not expected that any other modes will be used in the contest, but if they are, they shall be classed as CW.
31. All amateur bands may be used except 10, 18 and 24 MHz. VHF/UHF means all amateur bands above 30 Mhz. Note: On 50 MHz, the region below 50.150 has been declared a contest free zone, and contest CQs and exchanges may only take place above this frequency. Stations violating this rule will be disqualified.
32. Cross-band, cross-mode and contacts made via repeaters are not permitted for contest credit. However, repeaters may be used to arrange a contact on another frequency where a repeater is not used for the contact.
33. Stations may make repeat contacts and claim full points for each one. For this purpose, the contest is divided into eight consecutive three-hour blocks: 0100-0359. 0400-0659. 0700-0959; 1000-1259; 1300-1559; 1600-1859; 1900-2159; 2200-0059 UTC. If you work a station at 0359 UTC a repeat contact may be made after the start of a new block providing, they are not consecutive or are separated by five minutes, since the previous valid contact with that station on the same band and mode.
34. Stations must exchange ciphers comprising RS(T) plus a 3 digit number commencing at 001 and incrementing by one for each contact.
35. Portable stations shall add the letter "P" to their own cipher, eg. 59001P.
36. Multioperator stations are to commence each band with 001.
37. 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.
38. The practice of commencing operation and later selecting the most profitable operational period within the allocated contest times is not in the spirit of the contest, and shall result in disqualification. The period of operation commences with the first contact on any band or mode, and finishes either 6 or 24 hours later.

ar

Special event

Special call : II3CC
Location : Trento, ITALY
XVI National Meeting ANC
Associazione Nazionale Carabinieri
Period : 0700 UTC 15 April 2005 to 1900 UTC 17 April 2005
Band : 80 - 40 - 30 - 20 - 17 - 15 - 12 - 10 - 6 SSB, CW, RTTY, PSK31, SSTV.

Log on line on http://www.cota.cc
QSL Manager : IZ8DDG Orlando Balisciano, Via Villa Bisignano V Traversa no. 21, Napoli, ITALY 80147
C.O.T.A. Carabinieri On The Air
Associazione Carabinieri Radioamatori
Via S. Soprani 5/C
60022 Castelfidardo (AN) Italy
call sign IQ6CC

IZ6FUQ Stefano Catena

VHF/UHF - an expanding world

David Smith VK3HZ - vk3hz@wia.org.au
Leigh Rainbird VK2KRR - vk2krr@talstra.com

Weak signal

David Smith - VK3HZ

Welcome back from the holiday break. I hope you all enjoyed the festive season and made the most of any time off to enjoy your hobby.

While we have a break from our writing, unfortunately the bands do not. In fact things are probably at their busiest over the period just passed.

Sporadic E openings on 2 m seem to have been plentiful so far. On the afternoon of 20/11 Robbie VK3EK worked VK4ADM. Then on 8/12, Nick ZL1IU reports working VK4AFL, VK4ZDX and VK4LC on 2 m. Nothing was heard on 70 cm, but CH5A in Newcastle was very strong.

On the evening of 22/11, 2 m opened across the Bight from VK6 to VK5 and VK3 for the only time so far this summer. Wally VK6WG in Albany managed to work VK5AKK, VK5UBC, VK5ZK, VK5DK, VK3ZQB and VK3II. He was also heard by VK3HZ and VK3YB.

I must apologise that the deadline and holidays have beaten me this month, so I will have to defer the full report on the rest of the Weak Signal happenings until next month.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital Modes

Rex Moncur - VK7MO

Joe Taylor K1JT has provided an update on progress with JT1. As advised earlier, JT1 uses phase modulation and promised about 5 dB improvement over JT65. It was also aimed at contest operation as, with only a few Hz bandwidth, stations could operate within the same SSB pass band and work different stations by clicking on the different signals on a waterfall display. Well all that was based on computer simulations. In the real world of tropo-scatter and EME, things have not proved so easy, as tropo-scatter multi-path and EME libration both produce significant phase modulation, which substantially reduces performance. Joe now thinks JT65 might be as good as he can get. He is now looking at a modified JT65 with fewer tones and narrower bandwidth that he hopes might be useful for contest operation.

Adrian VK2FZ and Rex VK7MO completed what is believed to be the first VK 70 cm meteor scatter contact using FSK441A during the Geminids meteor shower on 14 December 2004. Adrian received 3 burns of over a second within an hour of operation while Rex received only pings with the best being 360 ms. The distance of 1072 km is a little short of optimum which is around 1400 km. The tests show that during meteor showers it is well worth trying 70 cm particularly for stations in the range 1200 to 1800 km.

Phil VK4CDI has been seen on FSK441 in Hobart and completed his first EME contact using JT65. Guy VK2KU is operational at his new QTH and rapidly adding to his grid square tally using JT65. At last count he was only one short of the magic 100. Rod VK2TWR is working regularly into Hobart on tropo-scatter using JT65 with signals averaging -24 dB and peaking to -11 dB when the Sydney to Launceston aircraft provide enhancement.

And finally, congratulations to Bob ZL3TY who has set a new 2 m EME World Record of 19,296 km. On the evening of 14 December 2004, he worked F8FHP using JT65b.

Please send any Digital Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

In this edition of the 2 & 70 FM DX report we cover the months lost to the Christmas break, which was November and December. Nothing startling to report really but a few interesting openings nonetheless.

Mike VK4MIK reports that on the 3rd of December he was able to work to VK4RMK, Mackay 535 km at 0620 local time - contacts Eric VK4EDN and Wal VK4AIV. Felix mentioned that Hayman Island VK4RDC was there in the Whitsundays (451 km) so he tried it and worked David VK4DJC through there. Hepburn predicted a possible opening to PNG but unable to make a contact.

On the morning of the 5th of December, Karl VK7HDX worked his furthest FM simplex contact on 2 m. This was across the Bass Strait to Chris VK3VSW in Geelong. Karl states "The signal was S2 but the audio was almost noise-free and very light QSB. Chris called "CQ" again on 146.500 so I answered his call, to my surprise he heard me. We had a brief contact then conditions changed". The distance for Karl's contact was 430 km and was Karl's first interstate contact.

From mid to late December in the SE, there were a few openings where 70 cm was running as good as 2 m and sometimes even better.

The 17th of Dec, I had good signals here from most of VK3, except extreme eastern areas. Stand out repeaters on 70 cm were – Grampians S9+40 at 471 km; Ballarat S9+40 at 378 km. On 2 m, Otway Ranges was S9 at 486 km; surprisingly Naracoorte in VK5 was punching through with an S9+60dB signal at 600 km.

Again in the morning of the 22nd of December, 70 cm conditions were most outstanding. The Barossa Valley SA 70 cm repeater peaked at 60dB+. Barossa

Robin L. Harwood VK7RH

Disaster brings shortwave into its own

The last days of 2004 became horrific when a massive earthquake off Sumatra, which measured 9.0 on the Richter scale, generated huge tsunamis, affecting over 12 Indian Ocean nations.

The first news filtered in and as the scale of the disaster became apparent, the electronic media scrambled to extensively cover it. Shortwave came into its own as the telecommunications infrastructure was severely disrupted. You will read elsewhere in this magazine of the heroic efforts rendered by ham radio operators to maintain emergency communications, particularly in Sri Lanka and Indonesia.

The BBC World Service quickly pre-empted its normal programming to extensively cover this and the majority of other broadcasters quickly followed. I also heard Radio Thailand on the 30th of December at about 2040 on 9535. They were rebroadcasting an English news bulletin recorded 12 hours earlier, concentrating on the Phuket relief efforts. Bangkok is scheduled to broadcast to Europe at this time.

The small Andaman and Nicobar Islands were particularly hit hard and at the time a Dxpedition was underway. The operation quickly became an emergency communications station, concentrating on relaying health and welfare traffic between the Indian mainland and Port Blair. I personally did not hear the station yet the broadcast station of All India Radio in Port Blair was heard worldwide as it is in the 90-metre tropical broadcasting allocation on 4760, fading in here at about 1200. Press reports say that this AIR station provided a vital role in linking up displaced persons as well as having essential information.

Banda Aceh was also severely hit by the earthquake and following tsunami. Up to then, this province was off-limits to the World because of a long running civil war. Telecommunications were destroyed and HF radios were initially used to maintain contact between Banda Aceh and the rest of Indonesia. I noticed that there was quite an upsurge in traffic all over the HF bands in Indonesian. I do not know if it all was related to emergency communications. Some of it apparently was not but I did hear an extremely busy YB emergency amateur net on 7055 LSB most nights. Their net discipline was superior to the hundreds of non-amateur Indonesian HF nets.

Propagation at the height of this disaster was very poor and we are very close already to the low point in the Solar Cycle. Signals above 18 MHz are becoming rarer with the 10 metre amateur band virtually dead. I have seen reports that this cycle will take longer than normal to bounce back.

Kol Israel has been broadcasting announcements that they intend to cease shortwave broadcasting on the 27th of March, which is the end of the B-04 period. Yet we have heard this before and always at the last minute, Kol Israel is reprieved. Will it happen this time? Incidentally Radio Slovakia got a temporary reprieve and will continue to the end of July. However Radio Vlanderen International in Brussels will cease external broadcasting at the end of March, although a relay of its domestic program in Flemish will be beamed to central Europe.

In December there was quite an increase in broadcasts in Ukrainian, following the election re-run. One station had originally scheduled to cease broadcasting via shortwave in Ukrainian yet with the volatile situation on edge, opted instead to continue indefinitely. The situation is still tense in early January.

It is somewhat interesting that Iraq has yet to appear on shortwave. I expect that they have other priorities but I am somewhat surprised that they are not here yet. We will wait to see what happens in the future.

Well that is all for this month. Until next time, all the best in monitoring.-

ar

VHF/UHF – an expanding world *continued*

Valley also has a linked repeater on 146.825, this was not heard at all at the time. VK5ZLT came back to me on the Barossa 70 cm device for a few overs.

Eventually I was able to work these 70 cm repeaters - Barossa (737 km), Crafers (764 km), Summertown (760 km) and South Adelaide (778 km). Just about all these peaked full scale.

The most amazing part of this opening was when calls were placed on 439.000 simplex. Brian VK5UBC was running a yagi on 70 cm but is over the hills a bit (764 km), Brian peaked to 5/6 on 439.000, but was mostly a steady 5/4.

Peter VK5ZLX could only run a vertical omni antenna and 25 W and is on the eastern side of the hills (735 km), Peter was constant at 5/9+40dB here on 439.000, brilliant!

We then had a call in on 439.000 from Rob VK5JSR .... mobile!! near Eudunda (741 km), unreal stuff! and Rob peaked over 5/9 signal here.

On the evening of the 18th December, Mike VK4MIK reports. Felix VK4FUQ alerted me that something was on the "boil" on 2 m. I headed for the shack. Felix said he was hearing 146.900 VK4RGA Amys Peak, 951 km from my location. I got on frequency and called Neville VK4HNL in Hervey Bay using the Bundaberg repeater, which is on 146.800, and linked to Amys Peak. Neville come back to my call, VK4WS Wayne from Brisbane, Adam VK4KSS south of Brisbane and Ray VK3TPT/4 in Maryborough all came back. Ray, with his VK3 callsign had a couple of us skip a heartbeat until we found out he was in QLD! Felix VK4FUQ managed to get in briefly as well. I also tried into NSW repeaters near the QLD/NSW border and further into NSW to no avail.

All on the contact were "over the moon" and Neville was rapt. All co-operated to get as many in as possible. Sure made our night in Queensland.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@bigpond.com.

ar

AMATEUR RADIO MAGAZINE INDEX 2004

TITLE	AUTHOR	ISSUE	PAGE
ARDF			
IARU Region 3 ARDF Championships	Jim Linton VK3PC	April	13, IBC
Awards			
Amateur Radio magazine awards		December	36
Awards Australia DXCC, listing 30 June 2004	Mai Johnson VK6LC	August	46
Book Review			
Instruments of amplification - Pure homebrew	Chris Flak VK2QV	April	47
Radio Projects for the Amateur Vol 3. Drew Diamond VK3XU	Ron Fisher VK3OM	December	23
Signor Marconi's magic box	Dr John Dawes VK5BJE	March	24
Contest Results			
80 metre VK/trans Tasman contest 2004 results		August	44
CQ WW DX 160 metre contest 2003		April	42
Harry Angel Sprint 2004 results		August	42
John Moyle Field Day 2003 results	Eric VK4NEF	February	47
Oceania DX contest 2003 results		August	43
QRP Day Contest 2004 results	Ron Everingham VK4EV	October	41
Ross Hull Memorial VHF-UHFcontest 2003-2004 results	John Martin VK3KWA	April	42
Spring VHF-UHF Field Day 2003 results	John Martin VK3KWA	March	50
Summer VHF-UHF Field Day 2004 results	John Martin VK3KWA	April	43
Summer VHF-UHF Field Day results correction	Ian Godsil VK3JS	May	40
VK/trans Tasman 160 m Contest 2004 results		September	41
Wadda Cup 2003 result		July	42
Wadda Cup 2003 results	Vince Henderson VK7VH	September	42
Contest Rules			
ALARA contest 2004 rules		April	44
COQC QRP Day contest 2004 rules	Ron Everingham VK4EV	July	45
Harry Angel Memorial Sprint 2004 rules	Ian Godsil VK3JS	March	50
John Moyle Field Day Contest 2004 Rules	Eric VK4NEF	February	45
Remembrance Day Contest 2004 rules	Alex Petkovic VK6APK	July	43
Spring VHF-UHF Field Day 2004	John Martin VK3KWA	October	42
VK trans-Tasman Contests 80 m and now 160 m	Bruce Renn VK3JWZ	February	45
VK/trans-Tasman contest rules summary	Ian Godsil VK3JS	May	41
Wadda Cup 2004 rules	Vince Henderson VK7VH	September	43
Contests			
Australian contests 2004		March	49
Surviving the Cabrillo contest log format	Vince Henderson VK7VH	November	42

TITLE	AUTHOR	ISSUE	PAGE
Dx-pedition			
Our next big adventure-Dxpedition to Baudin Rocks (VI5BR)	Peter Forbes VK3QI	September	19
Waldegrave Islands IOTA OC-261	Peter Forbes VK3QI	June	4 IBC
Education			
Education -The test of time	Ron Smith VK4AGS	February	48
General			
A "secure computer":an oxymoron	Bill Isdale VK4WI	November	26
A bouquet for Echo Link	Kingsley Savage VK5BHP	April	17
A visit to the Cardwell Bush Telegraph Heritage Centre	Felix Scerri VK4FUQ	August	24
Amateur radio helps a nation rebuild	Sam Voron VK2BVS/6O0A	October	IBC
Bayside District Amateur Radio Club Inc.		March	IBC
Celebrating the ITU's 139 birthday	EMDRC AX3ITU	July	39
Detecting signals from Mars global surveyor	Doug McArthur VK3UM	June	8
Donated ham radios for Somalia	Sam Voron VK2BVS	April	55
Edison and his contribution to wireless	Malcolm Haskard VK5BA	August	19
Envelopes with stamps from East Timor		March	18
First board meeting of the National WIA		July	30
Getting broadband ADSL	Will McGhie VK6UU	November	22
Helping a yacht in difficulty	Jim Linton VK3PC	May	8
Home brew competition	John Drew VK5DJ	September	34
Horse Endurance Ride 2004	Mike Patterson VK4MIK	September	32
How I became a Ham	Hayden Honeywood, VK7HAY	October	26
In Charlie's Way. Part 1	Ross Fraser VK2WN	March	14
In Charlie's Way. Part 2	Ross Fraser VK2WN	June	13
In Charlie's Way. Part 3	Ross Fraser VK2WN	July	20
In Charlie's Way. Part 4 "Charlie's quality"	Ross Fraser VK2WN	August	51
In Charlie's Way. Part 5 "Stop kidding"	Ross Fraser VK2WN	September	26
International YL Meet Korea 2004	Chae HK2LDW	February	43
IPGH two years old		April	16
JOTA for Scouts in SA	Lea Adcock	September	33
Just how old is the direct conversion receiver?	Steve Mahony VK5AIM	March	19
Many unqualified "amateurs"- the recruitment challenge	Jim Linton VK3PC	April	7
NCDXF/IARU beacon wheel for around the world in 3 minutes	Christoph Berg DF7CB	December	22
Never give up		April	22

TITLE	AUTHOR	ISSUE	PAGE
New ADSL modem: The continuing saga of getting broadband	Will McGhie VK6UU	December	55
New ARISS operations capability	Ian Able G3ZHI	November	39
New ARRL DXCC ruling February 2004	Wayne Mills N7NG	April	25
New members list		December	56
New microwave records set in VK4 and VK2	Russell Lemke VK3ZQB	December	29
On-air party goers revel in amateur radio's new era	Jim Linton VK3PC	February	27
Pileups are dangerous	Josef HB9CIC	March	55
PLC/BPL in Australia: progress or cause for concern	Ross Fraser VK2WN	August	37
PNG amateurs remember Kokoda gateway	Rick P29KFS	August	28
Propagation by the light of the silvery moon	Bill Isdale VK4TWI	December	57
Proposed new WIA constitution		March	25
Protecting your equipment	Alex Sentana LU9BAW	March	9
Protocol 802.11 in Australia - Use of spectrum at 2.4 GHz	Len Bray, ACA	February	24
Raft radio	Mike Patterson VM4MIK	May	13
Remembrance Day Amateur Radio contest Opening Address	General Peter Cosgrove, AC, MC	October	27
Riding and talking-Turning my motorbike into a mobile station	Steve Trebilco VK3NF	February	9 and IBC
Seasons at Mt Baw Baw	Chris Morley VK3KME	May	
Sherlock Homes and the 50 year mystery	Frank Shaw VK6ALF	June	18
Skills shortage in electrical, electronics, ICT, instrumentation.	Author name withheld	October	22
Special callsign for PI4AA	Remy Denker PA3AGF	April	16
Special Event Station ON60CLM		September	27
Still the sun	Bill Isdale VK4WI	November	49
Students link up with outer space	Doug Tamblyn VK5GA	February	21
Talking Lighthouses : EGARC goes to Point Hicks	Linda Stanford VK3VLS	July	11
Talking Lighthouses : Working the Light	Carl Schlink VK3EMF	July	13
Talking to the enemy	David Pilley VK2AYD	October	50
The ACA Review of Amateur Service regulation :a look at outcomes	Jim Linton VK3PC	July	25
The BPL fight	ARNewsline	March	59
The Gulag files	Richard Sawday VK5ZLR	September	35
The Honduras experience	Judy MacDonnell VE0JAM	December	24
The National Society for Australian Radio Amateurs	Michael Owen VK3KI	June	3
The 'No Code' influence on amateur bands	C. and K. Wright VK2UW and HKW	June	24
The secret war of wireless	David Pilley VK2AYD	August	14
The solar cycle	Bill Isdale VK4TWI	May	50
UA2 QSL Bureau	Victor Loginov UA2FM	March	16
VK for Fun WIA gets VK4FUN		September	32
VK3AIR-417Sqn Australian Air Force Cadets	Theo Kalkandis VK3AP	September	12
Well it may come in handy	Joe Rotenberg VK3BBN	November	19
Where to buy your callbook. (Club Listing)		November	55
WIA DXCC standings	Mal Johnson VK6LC	February	22
Women, Radio and Antarctica	Christine Taylor VK5CTY	July	27
YL Dxpedition to Christmas Island and Cocos Keeling Island	Gwen VK3DYL	October	37

Grid Squares

Grid square standings November 2003	Guy Fletcher VK2KU	February	26
Grid square standings February 2004	Guy Fletcher VK2KU	April	48
Grid square standings June 2004	Guy Fletcher VK2KU	July	47
Grid square standings September 2004	Guy Fletcher VK2KU	November	40

Index

Amateur Radio magazine index 2003	Colwyn Low VK5UE	February	30

Over to you

A 15 minute read	Fred Parsonage VK6PF	November	45
ACA is failing its customers	Geoff Wilson VK3AMK	February	25
ACA proposals re licence classes	Peter Scales VK6IS	March	61
ACA proposals re licence classes	Peter Scales VK6IS	February	25
ALARA's challenge	Bill Cross VK2WJC	February	44
Amateur licence exams- I had a dream	Neil Trainor VK3IJ	April	50
Directional antennae in Canberra circa 2004	Col Harvey VK1AU	March	61
Echo Link Baghdad	Ian Abel G3ZHI	March	61
EchoLink Adelaide	Alan Mallabone VK5KAM	May	37
Financial viability of proposed "NSW Division"	Doug Watkins VK2DDR	November	45
Ham advertising	Norm McMillan VK2XCI	May	37
Info wanted	Craig Martin VK2ZCM	May	37
Interference	Jack Cook VK2CJC	March	60
Kenya has made licensing much quicker and easier	Ted Alleyne 5Z4NU	May	37
New constitution	Neville Chivers VK2YO	April	50
Out question banks?	Neil Trainor VK3IJ	September	36
Phonetics	Chris Wright VK2UW	November	45
Purchasing equipment from overseas	John Ferrington VK6HZ	November	45
Questionable questions	Vincent Henderson VK7VH	September	40
Speaking with a single voice	George McLeod VK2FF	March	60
Steve Johnston OAM		March	61
To whom it may concern	Rob Owen VK3EA	September	36
Travellers Net	Jack Spark VK3AJK	October	51

TITLE	AUTHOR	ISSUE	PAGE
People			
"Ripple from the south" in his 100th year. Alf Chandler VK3LC	Jim Linton VK3PC	November	20
Bill Trigg VK3JTW		July	34
Chip of the old block	Jim Linton VK3PC	May	26
Gary Furr VK3KKJ		July	35
Michael Owen VK3KI 1st President WIA National	WIA Board	June	2
New Honorary Life Member of the WIA	Jim Linton VK3PC	May	17
Ron Cook VK3AFW		July	35
Satellites			
Six monthly summary of operational amateur radio satellites	Bill Magnusson VK3JT	February	60
Six monthly update of operational satellites	Bill Magnusson VK3JT	July	48
Silent key			
Abe Deitch	Norman Deitch VK2ZXC	July	40
Ann Renton VK4MUM	Gavin Reibelt VK4ZZ	February	36
Archibald Stephen Woolnough VK3BW	David McLachlan VK3ADZ	September	29
Arthur Johnson VK4PX	David Eyles	August	27
Athol Manning VK7LR	Ron Churcher VK7RN	February	25
Brian Eccleston Cabena VK3BEC	Ian Godsil VK3JS	April	50
Bruce Amos VK7ZBA	Harry Young VK7AR	February	25
Charles (Chuck) Farkas VK6CF	Mai Johnson VK6LC	August	27
Charles (Chuck) Farkas VK6CF	Mai Johnson VK6LC	April	33
Charles H. A. Armstrong VK1WW	Ted Holmes VK5ETH	April	49
Charles John Robinson VK7KP	Murray Robinson VK7YBE	August	35
Clem Tilbrook VK5GL	Jim McLachlan VK5NB	October	46
Colin MacKinnon VK2DYM	Ian O'Toole VK2ZIO	November	32
Colin Wright VK7LZ	Richard VK7RO and Rex VK7MO	May	37
Cornelius (Keith) Heemskerk VK2JY	Daniel Clift VK2DC	October	46
David Thorne VK7MR	Dave VK7DM and Richard VK7RO	February	25
Dietmar (Don) Grigoleit VK3NQ	Wilhelm Hirsch	March	17
Ernest Henry (Ernie) Sloman VK2BUE	Allan Madigan VK2OA	November	37
Franklyn Pain VK2DYP BE FIE (Aust) 1910-2004	Central Coast ARC	March	53
Fred Millington VK2ZFF	Hank Laauw VK2BHL	September	50
Geoff Bower VK2OI	Allan Mason VK2GR	August	45
Geoff Bower VK2OI		September	41
Geoff Page VK2BQ	Barry White VK2AAB	June	45
Geoff Page VK2BQ	Barry White VK2AAB	August	45
George Hunt VK3ZNE	Jim Linton VK3PC	March	7
Gil Sones VK3AUI - Quiet achiever, a good friend	Ron Cook VK3AFW et al	February	35
Harley Davidson VL2AHD	John Eyles VK2YW	September	2
Henry (Harry) S. Michael VK3ASI	Rod Green VK3AYQ	February	36
Henry Andersson VK8HA		November	4,29
Ian Leslie Pogson VK2AZN	Errol Trimingham VK2BET	August	45
Jack Hazlewood VK2AAT	Trevor Huntly VK2TM	August	45
John Bugler VK4AJR	Bob VK2CAN	May	48
John Elton VK3ID	Peter Elton VK3KG	June	21
John Kennard VK2GJK	Ann Benson VK4FAB	August	45
John Kraus W8JK	AMSAT	September	47
Keith Johnstone VK7RX	Richard Rogers VK7RO	February	25
Mike Walton VK2MJ	Garry Barker VK2TSR	June	23
Robert (Bob) Wheeler (was VK5NH)	Godfrey Williams VK5BGW	August	23
Rolf A Hallamore VK3ARH	Allen O'Halloran VK5OH	April	49
Ted (Edmund Charles) Roberts VK9QK,2QN,4QI,1QI	John Clare VK1CJ	April	15
W.S. (Bill) Walker VK5WW	Ross Walker VK2ZWT	March	41
Wilfred David Butler Smith VK2DAL	David Pilley VK2AYD	July	37
Sunspots			
Sunspots March 2004		May	43
Sunspots April 2004		June	47
Sunspots May 2004		July	55
Sunspots June 2004		August	55
Sunspots July 2004		September	55
Sunspots Sept 2004		November	51
Sunspots December 2003		February	63
Symposium			
AMSAT-UK Space Symposium 2004 (Cover Story)		March	43
WIA Central Region Symposium	John Dawes VK5BJE	November	24
Tech Abs			
A parallel wire dipole	Peter Gibson VK3AZL	August	17
A QRP ATU	Peter Gibson VK3AZL	May	49
A useful audio level indicator	Peter Gibson VK3AZL	October	28
A VHF/UHF discone antenna	Peter Gibson VK3AZL	April	51
An easy to build, dual band collinear antenna	Peter Gibson VK3AZL	August	26
Attenuators	Peter Gibson VK3AZL	October	48
Delayed turnoff fan control	Peter Gibson VK3AZL	June	22
Dual band dipole for 2 m and 70 cm	Peter Gibson VK3AZL	November	29
Easy to build 50:300 and 50:450 ohm transformers	Peter Gibson VK3AZL	June	39
FT-817compact fast charger	Peter Gibson VK3AZL	March	17
More solid-state lamps	Peter Gibson VK3AZL	April	26
Own your own Enigma machine-almost	Peter Gibson VK3AZL	September	14
Simple sound-card-to-radio interface circuits	Peter Gibson VK3AZL	September	14

TITLE	AUTHOR	ISSUE	PAGE
Simple sound-card-to-radio interface circuits (Addendum)	Peter Gibson VK3AZL	November	29
Solid-state those pilot lamps	Peter Gibson VK3AZL	March	18
Temperature measurements	Peter Gibson VK3AZL	May	47
The copper loop for 2 metre	Peter Gibson VK3AZL	May	46
The copper loop for 2 metre-addendum	Peter Gibson VK3AZL	August	16
The copper loop for 70 cm	Peter Gibson VK3AZL	December	53
The load shedder	Peter Gibson VK3AZL	April	26
The sleeve dipole	Peter Gibson VK3AZL	November	28
YS1AG 40 metre two element beam	Peter Gibson VKK3AZL	August	22
Tech Ant			
A compact effective vertical antenna for 160 metres Part 1	Drew Diamond VK3XU	December	5
A vertical antenna for 15, 17 and 20 metres	John Howlett VK6ZN	December	33
An active receiving loop antenna for 1.8 MHz	Drew Diamond VK3XU	May	10
An E-H antenna for 10 metre	Lloyd Butler VK5BR	September	16
My salt water antenna	John Titmus VK4JWT	November	25
Some useful wire antennas for HF	Rob S Gurr VK5RG	March	4
Some useful wire antennas for HF. Part 2	Rob Gurr VK5RG	December	9
The 204BA, a 4 element 20 metre beam plus ... Part 2	Bob Slutzkin VK3SK	November	10
The 204BA, a 4 element 20 metre beam plus a rotatable 40 cum 30 m	Bob Slutzkin VK3SK	October	20
The EH antenna	Lloyd Butler VK5BR	May	20
The E-H Antenna - Part 4	Lloyd Butler VK5BR	July	4
Trap aerial design	Lindsay Lawless VK3ANJ	October	35
Traps for multi band antennas	Lindsay Lawless VK3ANJ	March	21
VK5BR-X antenna	Lloyd Butler VK5BR	November	15
Winding a helical whip antenna	Roger Graham (was VK2AIV)	July	23
Tech General			
A basic GPS unit	Dale Hughes VK2DSH	June	14
A versatile battery box	Dale Hughes VK2DSH	November	12
Band-pass filters for the HF bands	Peter Kloppenburg VK1CPK	August	4
Battery pack for older handhelds	Roy Yeats VK2BRY	May	55
Elementary RF vector network analysis using a HP8410B	Richard Sawday VK5ZLR	May	14
Evolution of a high power "current balun"	J.C. Laib VK6CTL	December	27
Fixing up old broadcast gang capacitors	Drew Diamond VK3XU	October	24
Ham Radio internet repeater linking	Ian Abel G3ZHI	May	4
How to stop your bug walking	Ted MillesVK2FLB	July	21
PCI sound card interface	John Hodkinson VK2BHO	April	24
Radar band designations, old and new	Richard Sawday VK5ZLR	August	15
RSQ : an improved signal reporting system for PSK	Graeme Harris VK3BGH	August	6
Simple home brew PCB artwork	Malcolm Haskard VK5BA	July	18
The VK5DJ repeater controller	John Drew VK5DJ	October	4
Two tone testing	Jim Tregellas VK5JST	September	4
Understanding phase-locked loops	Elmo Jansz VK7CJ	September	10
Tech Inst			
A direct reading inductance meter for radio coils	Drew Diamond VK3XU	August	10
A dummy load and power meter for HF	Jim Tregellas VK5JST	April	9
A dummy load for 'dummies'	Jack Laib VK6CTL	November	9
A high performance 1 kHz to 25 MHz signal generator	Dale Hughes VK3DSH	February	11
A high power RF attenuator	Ron Saunders VK2WB	March	11
A simple TV-aligned crystal frequency reference	Drew Diamond VK3XU	April	18
A surprisingly accurate digital LC Meter	Phil Rice VK3BHR	April	4
A transmission quality checker, TQC.	Drew Diamond VK3XU	February	4
An RF bridge for antenna measurements	Roger Graham VK2AIV	May	24
An RF Bridge for antenna measurements correction		June	39
Erratum "Direct reading inductance meter"	Drew Diamond VK3XU	September	2
RF ammeters for high frequency measurements	Drew Diamond VK3XU	November	5
Simple battery chargers	Dr Bill Toussaint VK6LT	November	13
Tech RX			
An experimenter's LF/MF receiver	Dale Hughes VK2DSH	December	13
Trying to receive the digital SW(DRM) broadcasts	Brian Tideman VK3BCZ	July	9
Tech TX			
A CW transmitter for 40 metres	Joe Rotenberg VK3BBN	October	15
An experimental SSB generator from junk parts	Donald Howarth VK6JDM	July	15
Operating a 5 band HF amplifier on 10, 18, 24 MHz	Neville Chivers VK2YO	September	9
SSB back to basics transmitter	Neville Chivers VK2YO	June	19
The ultimate QRP project - HSC Part 3	Alan Gibbs VK6PG	February	49
Tech XCVR			
Know your second hand equipment TS-120 and TS-130	Ron Fisher VK3OM	June	40
Know your secondhand equipment FT-7 and FT-707	Ron Fisher VK3OM	September	50
Know your secondhand equipment TS-520 and TS-520S	Ron Fisher VK3OM	March	15
WIA comment			
The WIA position on broadband over power line (BPL)	Peter Walt VK2DKN	October	3

ar

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

December 2004
T index: 30

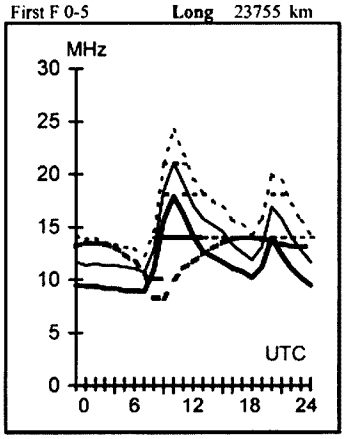
Legend
Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

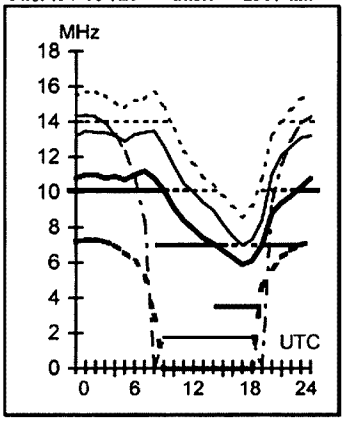
- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

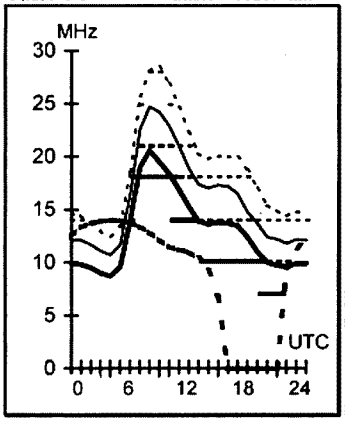
Adelaide-London 132
First F 0-5 Long 23755 km



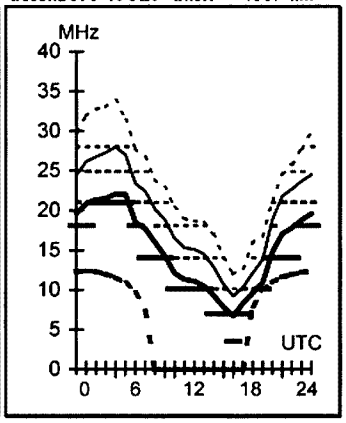
Brisbane-Dunedein 148
First 1F7-10 1E0 Short 2561 km



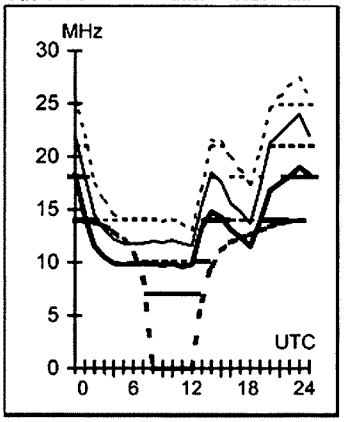
Adelaide-London 312
First F 0-5 Short 16269 km



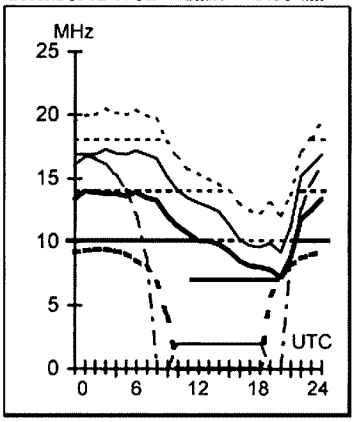
Brisbane-Honolulu 49
Second 3F5-10 3E0 Short 7569 km



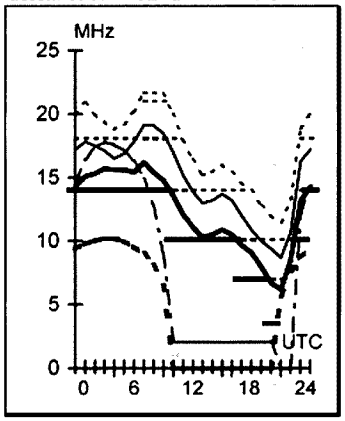
Canberra-New York 68
First F 0-5 Short 16217 km



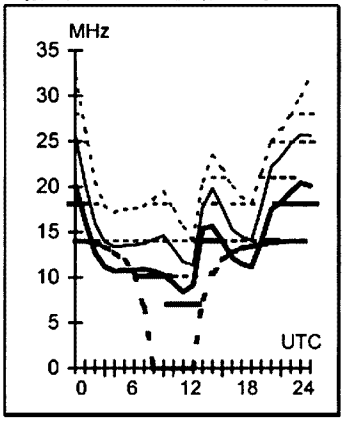
Darwin-Auckland 30
Second 3F12-17 3E Short 5136 km



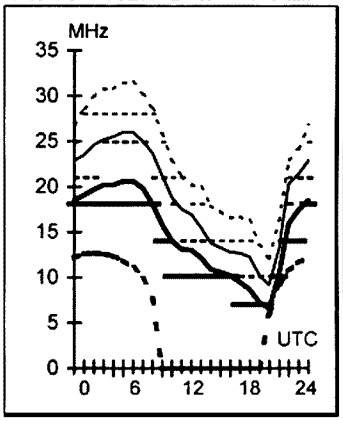
Adelaide-Manila 338
Second 3F10-17 3E Short 5813 km



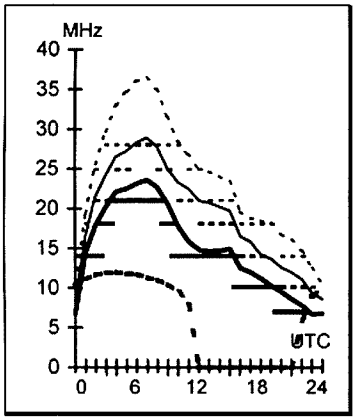
Brisbane-Miami 79
First F 0-5 Short 14761 km



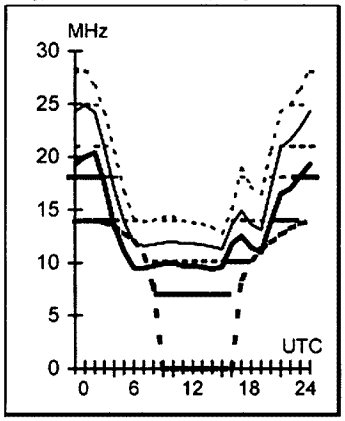
Canberra-Tokyo 352
Second 3F4-8 3E0 Short 7946 km



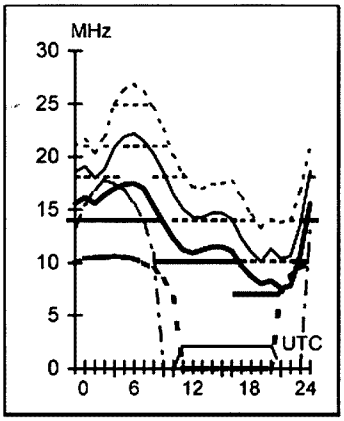
Darwin-New Delhi 309
Second 3F5-11 3E0 Short 7345 km



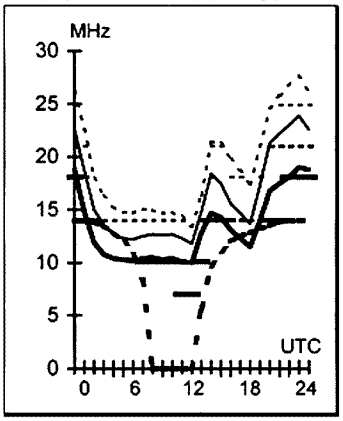
Adelaide-Vancouver 49
First F 0-5 Short 13421 km



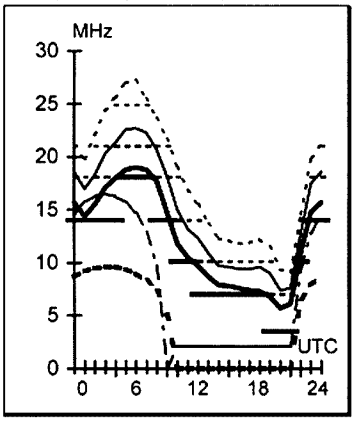
Brisbane-Singapore 293
Second 3F9-14 3E0 Short 6146 km



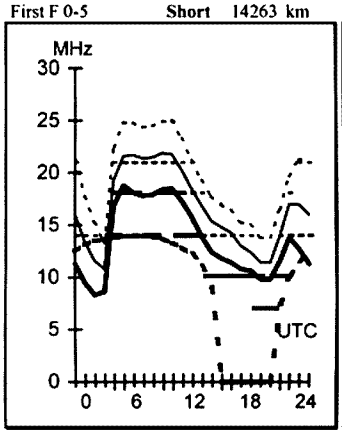
Canberra-Washington 70
First F 0-5 Short 15938 km



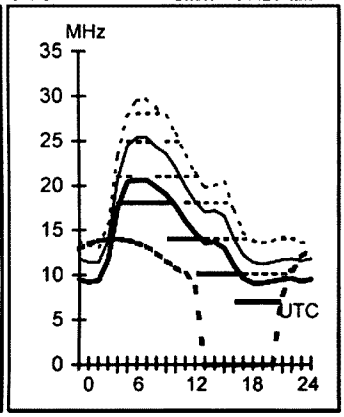
Darwin-Osaka 5
Second 3F11-18 3E Short 5262 km



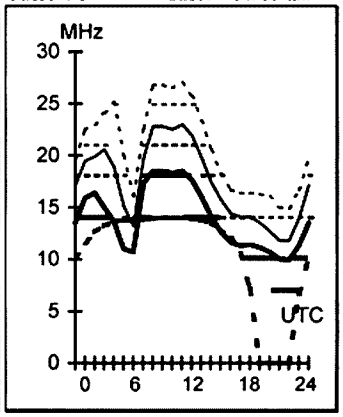
Hobart-Cairo 278
First F 0-5 Short 14263 km



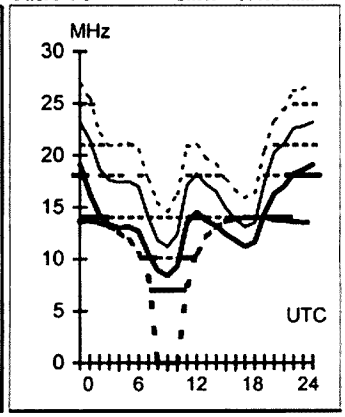
Melbourne-Moscow 316
F 0-5 Short 14428 km



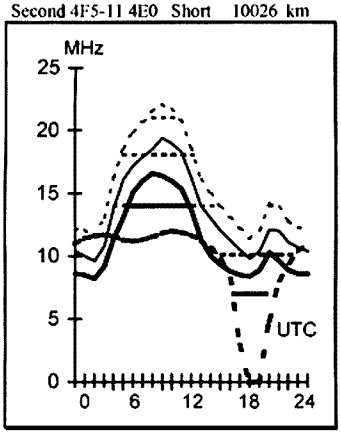
Perth-Dakar 259
First F 0-5 Short 14918 km



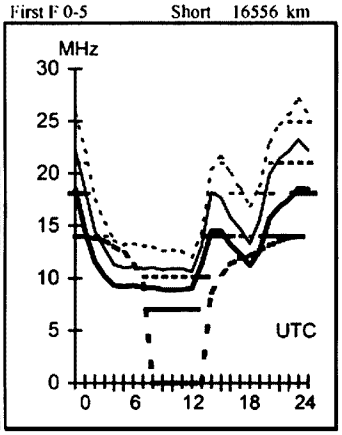
Sydney-Barbados 119
First F 0-5 Short 16155 km



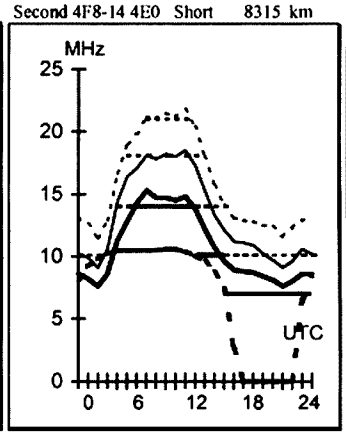
Hobart-Capetown 220
Second 4F5-11 4E0 Short 10026 km



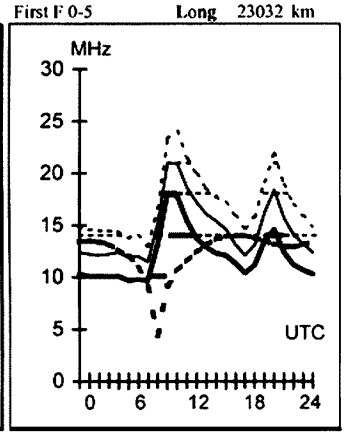
Melbourne-Ottawa 63
First F 0-5 Short 16556 km



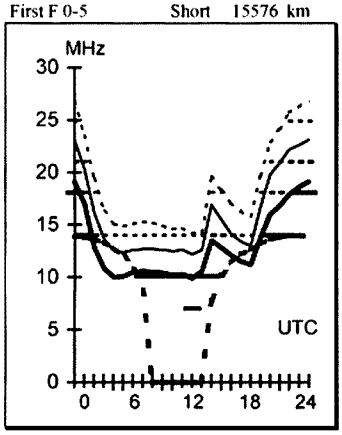
Perth-Johannesburg 248
Second 4F8-14 4E0 Short 8315 km



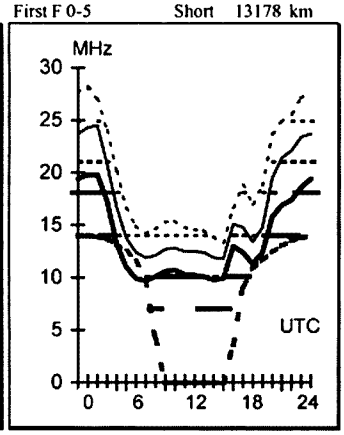
Sydney-London 139
First F 0-5 Long 23032 km



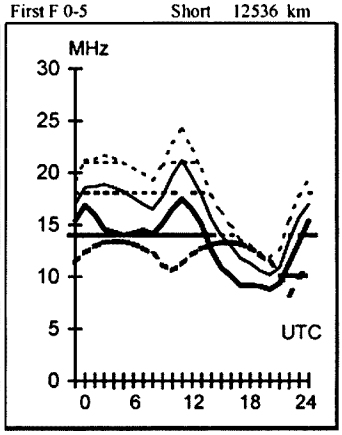
Hobart-Chicago 72
First F 0-5 Short 15576 km



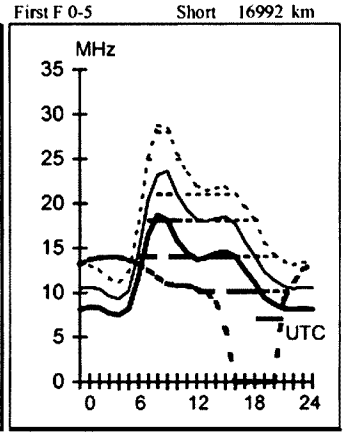
Melbourne-Seattle 50
First F 0-5 Short 13178 km



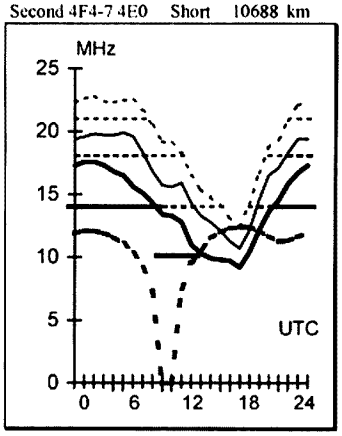
Perth-Montevideo 167
First F 0-5 Short 12536 km



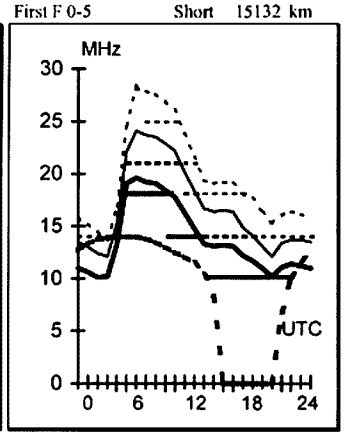
Sydney-London 319
First F 0-5 Short 16992 km



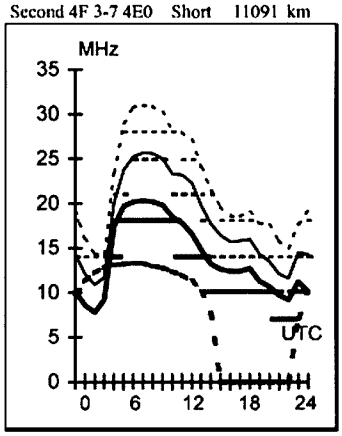
Hobart-Santiago 149
Second 4F4-7 4E0 Short 10688 km



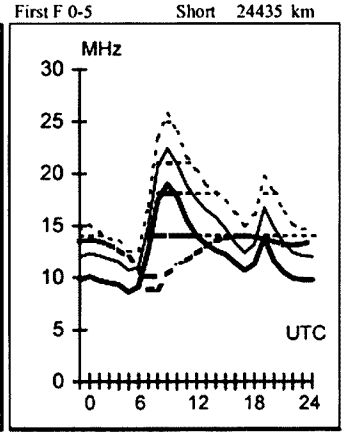
Melbourne-Sofia 296
First F 0-5 Short 15132 km



Perth-Tel Aviv 302
Second 4F 3-7 4E0 Short 11091 km



Sydney-Warsaw 133
First F 0-5 Short 24435 km



Hamads *classifieds* FREE

WANTED ACT

Cathode Ray Tube with electrostatic deflection and flat screen, 7 cm (70 mm) diameter, round or rectangular, preferably new or near new. For use in experimental spectrum analyser. Peter VK1CPK QTHR, Phone 02 6231 1790 pkloppen@austarmetro.com.au

FOR SALE NSW

Codan 8528 s/no B666 1 $350. **AWA Skyrover ATU-11** s/no 436 $40 VK2AY QTHR Phone 02 6368 4304.

Kenwood TS520S s/n 740845, original box, hand mic, manual, cable. Case a bit worn but G W O, $350 ono. **Yaesu FC700 ATU**, as new $150 O N O. Stan VK2EL QTHR Phone 02 4455 5825 sbourke@shoal.net.au.

Antenna horizontal rotator Kenpro KR-400RC complete with control unit $150. Also available free **non-working elevation rotator KR-500** complete with control unit. Ron VK2WB, QTHR, Phone 02 4232 1794.

FT1000MP + FL7000 (1.2 kW) Autotune linear. $4,000. VK2AYD Phone 02 6585 2647 davpil@midcoast.com.au.

Ultimate antenna system: 4el Tri-bander+rotator with 15 m high tramway + 12-V winch motor c/ w solar cells. ex VK2DAL (sk) buyer dismantles (Wauchope). $1,000. VK2AYD Phone 02 6585 2647 davpil@midcoast.com.au

FOR SALE VIC

Military equipment. 1) R-390A receiver. Reconditioned with new capacitors in IF etc. Engraved panel , knobs repainted, new top and bottom covers and radio aligned- naturally. Made by Imperial Electronics/Teledyne contract 37856-PC-63. S/N 1711. Emailed pix on request. PRICE: highest offer over $600 takes it. Freight /packing extra or personal collection. 2) **Grid Dip Meter James Millen** MFG #90651 A 325 kHz to 300 MHz, also included is **antenna bridge #90672.** Both items are new-old stock with manuals. The GDO in its plastic carry box has the quaint engraving hinge guaranteed to withstand one million openings. Price $250 plus packing post. 3) **ARC-27 UHF** transceiver, complete with control box and all cables. Price $220 plus freight. 4) **R 105A / ARR-15 Receiver** with mount/plug VGC Price $ 350. NOTE mount not available, rx and mount inseparable! Freight extra. 5) **C 732** control box for the ARC-2 with plug, $75 P + P extra. 6) **BC -348Q** receiver, no mods with non original dynamotor. Refinished front panel $350. 7) **DSE HF Linear Amplifier-** covers all amateur band 160 thru 10 m $40 posted. 8) **Power transistors** as used in earlier ICOM xcvr 2SC2290 Qty 4 available $10 each posted. 9) **Miscellaneous collection of old ICOM manuals** some with schematics and board layout pictorials. Include IC-2A, IC-730, IC-240, IC-255A, IC-402, IC-502A, IC-260A.. all new . Price $30 the lot posted. Pete Williams VK3IZ QTHR, or email jupete@bigpond .net.au Phone 03 5156 2053

Yaesu FT101E-$250, ICOM 22S-$100, Yaesu FT7-$300, DSE HF linear-$150, Heathkit aircraft band RX $50, Phantom 18 CH SSB/AM CB-$60, GME AM electrophone marine GX287 27MHz TRX-$100, **Kenwood 215A** hand held (for spare parts only) offers. Keith VK3AFI at Phone 03 5281 2264 or vk3afi@netlink.com.au

FREE: Repairable FT101 & other repairables/ convertibles. Phone 03 5155 1380 to arrange personal pick up (preferred) or transport from VK3ANJ QTHR; also interesting redundant items from junk box worth inspecting by home brewer.

Leader LSG-11 signal generator. $120 ono. Fred VK3JM, QTHR, Phone 03 9801 4972. Email fstorey@jeack.com.au

WANTED VIC

DSE R.F Aerospace Sat 7018GR Yagi Antenna Cat No D-4701. Contact VK3UCM 03 97301619

FOR SALE QLD

Book by R Newsome, ***Early Radios in Australia: How to Collect, Understand and Restore them.*** $15 +PP $3 in Australia. Peter Hadgraft Phone 07 3397 3751 peterhadgraft@yahoo.com

ICOM IC 725. HF all band Transceiver, **Emtron AT - 300A** antenna tuner, VGC, $820 +postage. 07 5479 1517, email beryla@dodo.com.au

WANTED QLD

Orr's Radio Handbook 10th/13th/14th/15th/17th/ 18th ed. **Silicon Chip magazines,** Jan 1990 to Dec 2002. Peter Hadgraft Phone 07 3397 3751, peterhadgraft@yahoo.com

FOR SALE SA

Radio shack clean out. ICOM base station, speakers, magazines, microphone inserts, aluminium tubing and lots more. Send SASE to Paul VK5MAP QTHR for list. Phone 08 8651 2398.

• **Kenwood R-1000** receiver in as new condition. Now in aged care home. No antennas allowed. $200. Purchaser to collect. Peter Russell L50753, Phone 08 8260 7973.

FT101B. Good cond. Has narrow CW filter installed and 27MHz band, $320.00. Would prefer local pickup as is a large and heavy radio to pack and post. Craig VK5ZAW Phone 08 83321957

MISCELLANEOUS

• **The WIA QSL Collection requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

TRADE ADS

PSK-31, SSTV, RTTY SOUNDBOARD Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

RADIO SPECIALISTS sales and servicing. Buying radios. Shop: 243 Seacombe Road, South Brighton (Adelaide) 08 8298 3906, email rfwizard@optusnet.com.net.au VK5VK

About hamads....

- Hamads may be submitted by **email** or on the **form on the reverse of your current Amateur Radio address flysheet.** Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newunltd@bigpond.net.au* **Fax:** *03 9756 7031*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

HAMADS ARE FREE

ADVERTISERS INDEX

AEI	53	G & C	9
Andrews	25	Icom	16, OBC
Benelec	IFC	Ozgear	24
Bushcomm	8	TTS	32
Com-an-tena	17	54s	63
www.vk3ajj.com	63	VK Discounts	63
TET-Emtron	16		

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: **★ $ 75 for full members (F grade), ★ $ 70 for pensioners and students (G and S grade), and ★ $ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org, follow national news prompts. Contact nationalnews@wia.org.au, National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout		***Being revised***
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt VK4KF Ken Fuller	Phone 07 3221 9377 qac@wia.org.au ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK1WIA Sunday 9.0am via WIA network
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

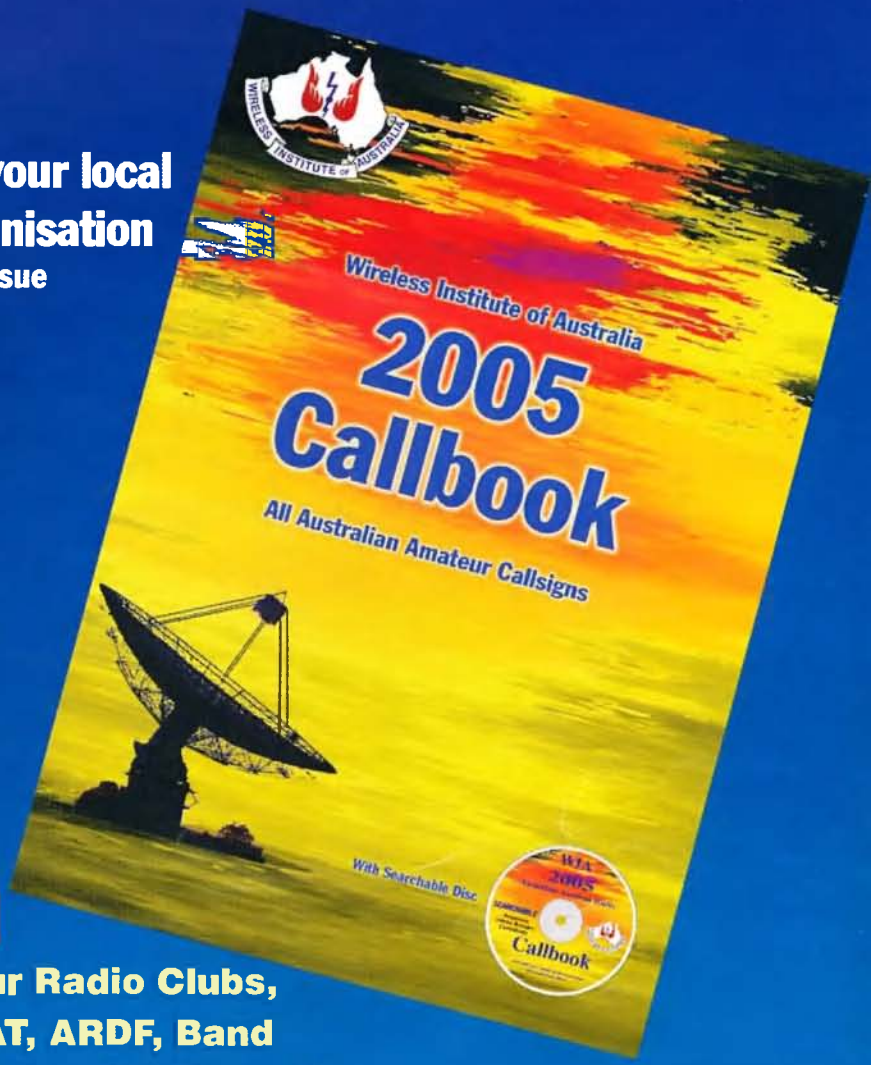
Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

Now available from your local Amateur Radio Organisation
see list in November issue

2005 Callbook

All Australian Callsigns



Plus great detail about:

The new WIA, Amateur Radio Clubs, WICEN, ALARA, AMSAT, ARDF, Band Plans, Beacons, Broadcast Stations, the ACA, Examinations, QSLs, Great Circles, Maidenhead, DXCC, Packet Radio, Repeaters and more.

How to get your copy

Contact your local Amateur Radio Club, details in November AR, or Contact WIA National Office

(03) 9528 5962 or nationaloffice@wia.org.au

Prices from National Office	Pick up	Posted
WIA Member	$22	$25
Non-Member	$30	$33

MEET ICOM'S CHAMPIONS AT WYONG FIELD DAY

Talk to our Experts including Action Communications, Newcastle Prosound and Radio Supply Pty & find out how to

WIN A PAIR OF ICOM TRANSCEIVERS

Central Coast Field Day, Wyong Sunday 20th February 2005
Venue: Wyong Racecourse

For more information on Central Coast Field Day please visit: www.ccarc.org.au

AMATEUR | AVIONICS | LAND MOBILE | MARINE | RECEIVER | UHF CB

ICOM

PH412 AM02

Volume 73 No 3
March 2005

Amateur Radio

$6.50
incl GST

WIRELESS INSTITUTE OF AUSTRALIA

The magazine for AUSTRALIAN radio amateurs

This DXpedition's dramatic ending

Multiband magnetic loop: 160 – 15 metres from your coffee table
Peter Parker VK3YE

VK5BR_X3 antenna for 40 metres
Lloyd Butler VK5BR

FT920 antenna tuner repair
Barry White VK2AAB

Another method of making "air-wound" transmitting coils
Drew Diamond VK3XU

Those bargain portable generators
Steve VK5AIM

9 770002 685031 03

BENELEC

YAESU

RECEIVERS

VR-120 Wideband Receiver
0.1 to 1300 MHz. Ultra long Battery Life
640 CH Memory

Price $299.00

VR-500 All-Mode Wideband Receiver
0.1 to 1300 MHz
Modes: NFM, WFM, AM, USB, LSB, CW
Multiple power source capability

Price $575.00

VR-5000 All Mode Wideband Receiver
Ultra-convenient Auto-Mode
World clock & Programmable Timer
2000 CH. 0.1 to 2600 MHz

Price $1,354.00

HANDHELDS

VX1 Ultra Compact Dual Band
2m, 0.7m

Price $338.00

VX2 Ultra Compact FM Dual Band
1.5/3W
Long-life 1000mAh Lithium-Ion Battery included

Price $359.00

FT-60R 144/430 MHz FM Dual Band 5W
2m,0.7m
High power output 5-Watts
Ni-MH Long-Life Battery

Price $399.00

VX5 Heavy Duty Triple Band 5W
2m, 6m, 0.7m

Price $506.00

VX7 Submersible Tri-Band Magnesium 5W
2m,6m,0.7m
True Dual Receive:

Price $725.40

www.benelec.com.au

Authorised Yaesu Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosound.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
sales@strictlyham.com.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8342 4700
brenton@posnav.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

YAESU

Amateur Radio

Volume 73, Number 3
March 2005

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Wrong place, right time 13
Mrs. D. Bharathi Prasad VU2RBI

Times of change for the Wireless Institute of Australia 27
James Mclachlan

First Class CW Operators' Club (FOC) 36
David Pilley VK2AYD

TECHNICAL

VK5BR_X3 antenna for 40 metres 5
Lloyd Butler VK5BR

FT920 antenna tuner repair 7
Barry White VK2AAB

Suds to solder 9
Ian Jackson VK3BUF

Another method of making "air-wound" transmitting coils 10
Drew Diamond, VK3XU

Multiband magnetic loop 16
Peter Parker VK3YE

Those bargain portable generators 21
Steve Mahony VK5AIM.

Remote dc power through your coax (Technical Abstracts) 23
Peter Gibson VK3AZL

Antenna mounts for all occasions (Technical Abstracts) 24
Peter Gibson VK3AZL

COLUMNS

ALARA 38
AMSAT 39
Contests 41
Directory 56
Editorial comment 2
Hamads 54
HF predictions 52
Over to you 25, 26, 37, 46, 47
Silent keys 36, 43
Spotlight on SWLing 37
Technical Abstracts 23

News from...
VK1 30
VK5 34
VK6 31
VK4 ..... 30, 35
VK7 32
WICEN Victoria 22
VHF/UHF – an expanding world 48
WIA comment 3
WIA news 4

Our Cover this month

Mrs. D. Bharathi Prasad VU2RBI, leader of an amateur radio DXpedition team which suddenly found itself providing emergency communications in Andaman and Nicobar Islands during the recent earthquake/tsunami disaster. See full story page 13.

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

June Fox	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
	Robert Broomhill	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ewan Mcleod	VK4ERM
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Treasurer	David Pilley	VK2AYD

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
Education	Ron Smith	VK4AGS
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
FTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	t.b.a.	
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glen Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

Things that go astray...

...and other gremlin activity

Greetings to members and readers welcome to March AR. Christmas and the New Year seem a long time ago and Easter is upon us.

The John Moyle Field Day takes place on the weekend of March 19th – 20th. Some of us have been planning what we will do this year to improve on last year. Do we need to go to a different location or just improve the equipment? Some of us will be in confusion because as we read this the FD is less than two weeks away. Some of us will be saying "another #$@#$ contest". However the FD is a great chance to sort out gear to work off portable power, be it batteries or generators so that if we are needed for an emergency we are at least able to list what we need and dig it out of the shack and shed. I had put off buying a generator until last year as I would have found it hard to justify $800 plus from the household budget but when an 850 watt generator became available last year for $185 I went out and bought one. There is a write up on these inexpensive generators in this issue.

While on contests we need to remember if WIA runs them and people participate, then there is a need to publish the results. Now all our Contest managers are volunteers and unfortunately processing the results at times cannot be top priority. As I understand it every log is cross checked against all other logs submitted which it had contacts with. This is a very time consuming activity. My own feeling is that if we check 10 % of each log and check 10% of the logs 100% then this should be enough. When the results have been processed they are send to the WIA Contest Coordinator and AR. They should then appear in one of the next two issues of AR. Unfortunately things go astray and in this issue you will at long last find the results of the 2003 RD contest. This is no fault of the Contest Manager but unfortunately the Editor at this stage can find no trace of the correspondence regarding receipt of the 2003 RD results. So with my sincere apologies for the LONG delay the results of the 2003 RD are in this issue.

Other activities DXCC. The DXCC standings were published last month and if you could not work out what was what, you had good reason. The column headings got moved around in their conversion from an XL spreadsheet, where they looked great, to our InDesigin software used to set up the print pages. So to help you out, at the bottom of page 6 we have reprinted the heading, column headings and the first few lines of the table. You can then copy or cut this out and paste it at the top of page 43 in the Jan/Feb issue. Sorry for the inconvenience.

We have made one change in presentation this issue. News from State Advisory Committees and clubs is collected together by states under the heading "News from".

Regards Colwyn VK5UE

March events

John Moyle Field Day Contest 2005
19 – 20 March, 2005
Details on page 52 of Jan/Feb AR

Urunga Radio Convention
26 & 27 March
Details on page 41 of Jan/Feb AR

Michael Owen VK3KI

The WIA Annual General Meeting

An insert in this issue of AR is the formal Notice of the Annual General Meeting to be held on 7 May 2005 in Canberra, together with the Annual Accounts, Auditors' Report and Directors' Report.

The 2005 AGM marks yet another stage in the transformation of the WIA from a federal body to a single national body.

The AGM will review the last financial year of the WIA, the year ending 31 December 2004, as the WIA's financial year is a calendar year. Of course, the new Constitution was only in place for about half of that year, and so the financial results may not really reflect the results we would expect in a full year.

In the past the Annual General Meeting of the WIA has been called the Federal Convention, with the 7 members of the WIA, the Divisions, represented by their Federal Councillors, and usually one or two others from the Division. Now, every member is entitled to participate.

But how are we going to run the AGM?

Your Board has given this a lot of thought, and has been helped by the enthusiasm of the Canberra Region Amateur Radio Club, formerly the VK1 Division, to conduct the AGM in the national capital, and to make it attractive for as many members as possible to attend.

This year, as it is still the first year since adoption of the new Constitution, there is no election of directors, as all the Directors appointed by the Constitution were appointed for an initial term of either two or three years. Next year, three directors will retire, and while they may offer themselves for re-election, there may well be other candidates.

Accordingly, the only business of the AGM is likely to be formal.

But the Board considers it very important to provide members with as much opportunity as possible to raise whatever matters they wish, and to have the opportunity to comment on as many aspects of the WIA's activities as possible.

That is why we are conducting what we are calling an Open Forum. Let me repeat what appears about the Open Forum from the Notice of Annual General Meeting, hopefully with the insert to this issue.

Immediately following the closure of the formal Annual General Meeting an Open Forum will be conducted. Detailed reports will be submitted on behalf of the Board, the Institute's Coordinators and those responsible for particular aspects of the Institute's activities. Their written reports will be available for those attending the Forum, and each, either directly or by a representative, will be asked to briefly present their report in just a couple of minutes, identifying any major issues affecting their area of responsibility.

Members are encouraged to discuss any matter arising from any of the reports, and to raise any matter affecting amateur radio or the Institute.

The Board hopes that this format will provide the opportunity for as many members as possible to express their views on as many of the different activities of the WIA as possible.

And that is the point.

The WIA coordinates or is otherwise involved in many activities, from awards and contests, to satellites, to the new Foundation Licence syllabus, to the risk of BPL, the conduct of examinations under the current procedures and the search for a better means of assessing candidates, the publication of this magazine and the call book, indeed almost all aspects of amateur radio.

And quite different matters are very important to different people.

Many aspects of the WIA's new structure are still evolving, such as the role and responsibilities of the Advisory Committees, as is, in fact, how best to conduct the Annual General Meeting.

And, in the end, the WIA is a voluntary organisation, and most of what it does depends on the time and skills of the many people who take on the many tasks that together make up our WIA.

And that at times also means identifying priorities.

That is why we want just as many amateurs as possible to be there. Please tell us what we are doing that is right, as well as what you think can be done better or should be done differently.

Alan Hawes, VK1WX, and the Canberra Region Amateur Radio Club have accepted the challenge of helping make the weekend attractive.

They have arranged our Annual Dinner for Saturday night, after the AGM and a visit on Sunday morning to the Canberra Deep Space Communications Complex at Tidbinbilla.

So, please see if you can participate in this first opportunity for all members to participate in our first really national function. Please review the formal documents for the AGM, and the information about the weekend in Canberra.

I hope that as many members as possible will come to Canberra to contribute their opinions and judgements in what we hope will be a constructive and enjoyable environment.

And I hope that we will be able to make the weekend worthwhile, both in the opportunity to contribute formally and informally, particularly in the Open Forum and to visit the national Capital with other amateurs.

ar

WIA news

Ewan McLeod, VK4ERM, appointed WIA Vice President

Last November WIA Director and Vice President, Ernie Hocking, VK1LK, advised the WIA board of his resignation as a director of the WIA and therefore as Vice President.

The WIA Constitution provides that if the position of Vice President becomes vacant the Board shall appoint another director as Vice President for the balance of the previous Vice President's term.

The Board has appointed Ewan McLeod, VK4ERM, as Vice President of the WIA.

Ewan is presently a Director of the WIA, Chairman of the Queensland Advisory Committee and Queensland Region WICEN Coordinator. Ewan has indicated to the Board that he will resign from the Queensland Advisory Committee.

IARU Region 3 appoints new officials

Peter Lake, ZL2AZ, has been appointed a Director of IARU Region 3 to fill the vacancy created by the death of the Chairman of Directors, Peter Naish, VK2BPN.

ZL2AZ assumed office on February 2, 2005. On February 4, 2005 following the election of ZL2AZ, the Directors unanimously appointed Director Young-Soon Park, HL1IFM, as Chairman of Directors, IARU Region 3.

President visits Alice and Darwin

WIA President, Michael Owen, VK3KI, will be visiting Alice Springs in early March.

The Alice Springs ARC has organised a meeting for 7 pm on Friday 4 March at the Elkira Motel.

On Sunday Michael will be travelling to Darwin, in response to an invitation from the Darwin Amateur Radio Club.

The Club will be hosting a BBQ commencing at 6:30 pm at Sports House, Fanny Bay on Monday evening, 7 March, followed by a slightly more formal meeting commencing between 7:30 and 8 pm.

Michael will remain in Darwin for a couple of days, taking the opportunity to meet with the Public Trustee to finalise some matters relating to the generous bequest to the WIA in the will of the late Henry Andersson, VK8HA.

Michael hopes to meet as many Darwin amateurs as possible during this visit, as he seeks to identify how the WIA can better serve clubs as remote as Darwin and Alice Springs.

Successful NSW Central Coast Field Day

The VK2 annual Central Coast Field Day was held on Sunday, February 20 2005 and was very well attended.

The WIA set up a stand on the first floor in the coffee lounge area with most of the WIA directors in attendance. It seemed from the hectic pace that most of those attending the field day dropped in for a chat, to ask questions, to make suggestions or to join the WIA.

The stand featured several items which will be sold by the soon-to-be established WIA store. The items on display included WIA caps, polo neck shirts, summer wind jackets and a carry bag.

Twenty eight people took the opportunity to join the WIA.

This, along with the 9 other members who joined during the same week, added 37 new members, which was around a 1% increase in WIA membership for the week.

WIA director interviewed on Melbourne radio station

On Monday evening, January 24 2005, WIA director Robert Broomhead, VK3KRB was interviewed on radio station 3WBC on 94.1 FM on the subject of BPL.

This follows the very successful interview by WIA director Phil Wait, VK2DKN, on radio 3MDR's popular TekTime show a week earlier.

Industry Canada reports "overwhelming agreement" to drop Morse requirement

In January Radio Amateurs of Canada (RAC) reported that an Industry Canada analysis has found "overwhelming agreement" that Canada should move away from retaining a Morse code requirement as "the sole means of gaining access" to the HF amateur bands.

NZART and WIA join forces on the BPL issue

In an effort to make the most effective use of resources and because the BPL issues in both Australia and New Zealand are similar, the NZART and the WIA will work as a team in an effort to achieve a positive outcome on this issue for Amateur Radio. The NZART have produced a very informative web page with many links to the WIA website and many other related sites.

The WIA has added a link to the new NZART WebPages via the BPL menu and to the very extensive and informative ARRL BPL pages.

The European Commission EMC Directive

The European Commission has released a new EMC Directive, which contains some positive news for European Amateurs in their fight against interference from BPL/PLC.

The Directive is the result of a review and restatement of an earlier Directive (89/336) that states the general principle that radiocommunications services are to be protected from emissions from electrical equipment and networks.

For the first time the Amateur Radio Service is specifically mentioned as a service, which requires protection against "intolerable" interference. Unfortunately, the Directive does not establish "the level" (or levels) considered "intolerable".

ARRL Tells FCC to "Reconsider, Rescind and Restudy" BPL Order

The ARRL has petitioned the FCC to take its broadband over power line (BPL) Report and Order (R&O) back to the drawing board. In a Petition

continued on page 8

VK5BR_X3 antenna for 40 metres

by Lloyd Butler VK5BR

Here is some more on the X3 antenna.

This model has a base band of 40 metres but it can also be operated with less efficiency on 80 metres

The article is a follow up to the previous article for the VK5BR_X antenna published in November 2004 Amateur Radio. The previous article discussed background theory of the X antenna and a model of the X3 version made for the 20 metre band. The article also discussed how the 20 metre model could be tuned up on the secondary band of 40 metres. The following article describes a version of the X3 for the primary band of 40 metres with the potential for operation on a secondary band of 80 metres.

The 40 metre antenna is similar in operation and wiring connection to the 20 metre version, again using resonant open wire line to feed it and a Z Match Tuner to adjust the antenna system matching from within the Radio Shack.

Assembly

The assembly for the 40 metre version is shown in figures 1, 2, & 3. The new antenna has made use of square galvanised pipe sections for the E Field plates rather than cylinders as used in the 20 metre unit. This was done to simplify the assembly holding the E plates apart and mounting the H field generating coils. As can be seen from the diagram, there are two simple rectangular plates made from some form of insulating material. I used some tempered hardboard which I had on hand. The coil connection as included in the previous article, is repeated in figure 4.

Using the coils shown, resonance with the E plate capacitance occurs just below the 7 MHz band at 6.5 MHz. Of course exact resonance is not important as this is corrected by reactance fed from the Z Match adjustment. The reflected resistance component at 7 MHz measured around 40 ohms.

I was very impressed with performance on the air on 7 MHz. Of all the Crossed Field or EH antennas I have constructed and tested, this one on this band has worked the best. Reports from various amateur stations around Australia were on the lines that there was little difference between the X3 antenna and my reference half wave inverted V antenna. For all tests, the X3 antenna was hung in the vertical position about 2 metres above the ground.

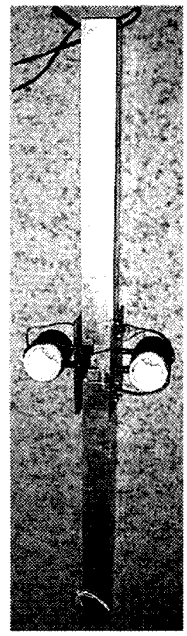


Figure 2

The next question was whether the 40 metre X3 would work on the next band down as the 20 metre version had done. On 80 metres, the antenna presents quite a high inductive reactance in series with its load and I found it difficult to get a Z Match unit to work directly into that reactive load.

However the antenna can be made to match on 80 metres by adding a series

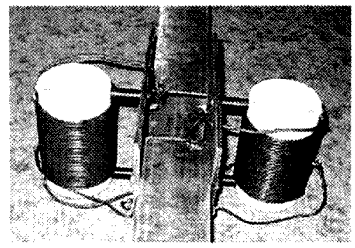


Figure 3

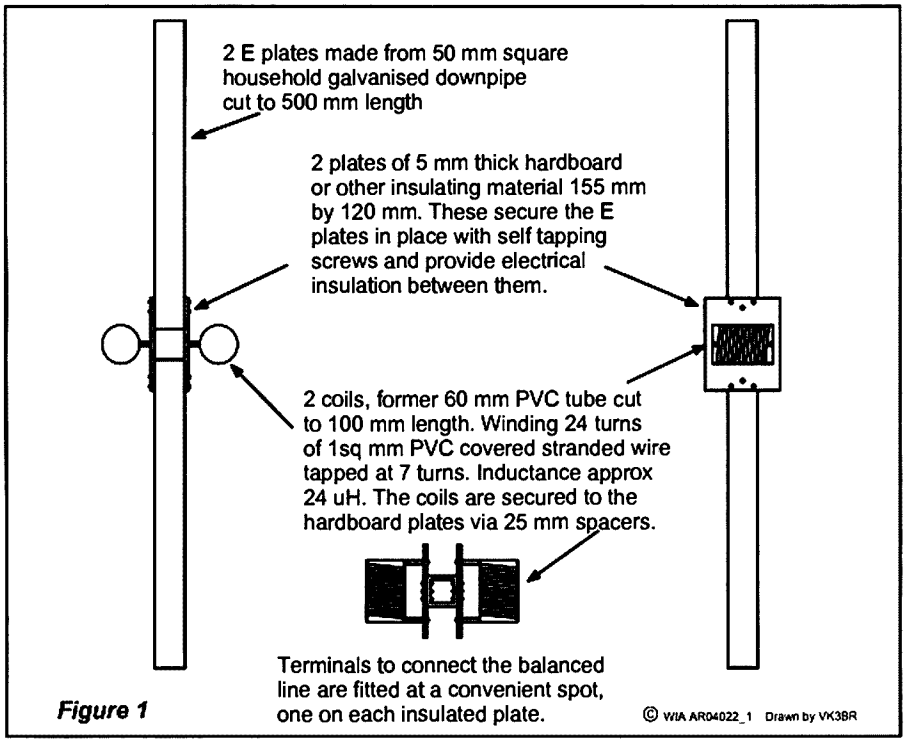


Figure 1

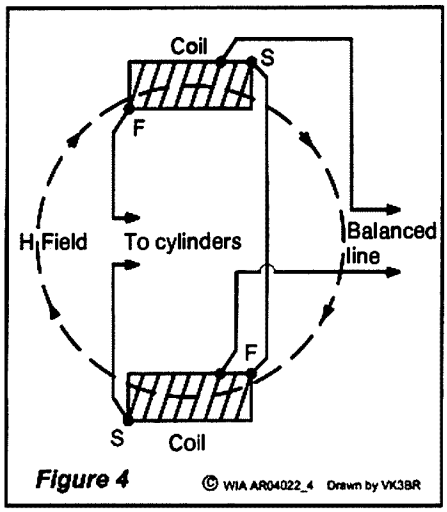


Figure 4 © WIA AR04022_4 Drawn by VK3BR

phase correcting capacitor in series with each leg of the balanced line feeding the antenna. The exact capacitance value of the capacitors is not critical and values around 200 to 400 pf do the job. The Z Match unit will then work and a healthy field is then generated around the antenna. Adding these capacitors has little effect on the operation on 40 metres and hence they can be left in place for both 40 and 80 metre bands. When the series capacitors are to be used, they need to have high RF current rating. That means they must have low series loss resistance to prevent power loss and overheating in the capacitors .

Some general notes

In reviewing test results and making some further measurements, both the 20 metre and the 40 metre versions of the X3 antenna have shown similar characteristics even though they are constructed a little differently.

The resistive component reflected at the antenna input at the base frequency band is around 40 to 60 ohms. This drops considerably when operating on the half frequency band to around 15 ohms. There is possibly a case for moving the coil taps up a bit further but I haven't tried this.

Radiation efficiency is clearly much better on the base band than at half frequency. Series phase correction capacitors in each balanced line leg are desirable to correct for inductive reactance when operating on the half frequency band. These can be left in for the base band without making much difference to the operation on this band. Suggested values are 220 pf for the 20 metre antenna and 330 pf for the 40 metre antenna.

A considerable degree of loss can occur in the Z Match Tmer depending on the length of line and what actual impedance components are reflected back to the Z Match. So because of losses here, overall efficiency can be quite variable. It is also possible to get a wrong match where the SWR meter facing the transmitter indicates a match but the tuner circuit is actually matched to an unbalanced form of load it has found. I find that it pays to check with a fluoro lamp for a balanced field around the two dipole plates on the antenna. If it is one sided, it is probably an erroneous match.

Summary

X3 models of the antenna have now been made for base frequencies on 20 metres and 40 metres. It has been shown that the 20 metre model can also be made to work on 40 metres and the 40 metre model can be made to work on 60 metres, using adjustment of the Z Match tuner in the radio shack.

The 40 metre model of the X3 operating on its 40 metre base band has produced some surprisingly good results which compare with those from my half wave inverted V, and better the results obtained from other crossed field models I have assembled and tested.

Based on my limited experience with the X3 antennas, I think they work better on their base band than on their secondary band. However the fact that they can be switched between two bands by tuning change within the shack is a useful feature. The main problem on the secondary band is loss in the matching system using the Z Match. I found this particularly applied in tuning up the 40 metre antenna on 80 metres.

A further article will follow on X3 antennas which have been made for a base band of 80 metres and 10 metres. The article will also include an alterative assembly method for the original 20 metre unit and some detail on efficiency measurements carried out on units for three of the bands.

References

1. The VK5BR_X Antenna - Lloyd Butler VK5BR - Amateur Radio November 2004
2. Simple Z Match Tuner Simplified - Lloyd Butler VK5BR - Amateur Radio, June 2000. (Also published on the VK5BR Internet site. Ref 3)
3. Refer to articles on the EH Antenna by VK5BR at:- http://www4.tpgi.com.au/users/ldbutler/
   Or link from:- http://www.qsl.net/vk5br/

ar

Correction to DXCC Standings (AR Jan/Feb page 43)

Headings should have been as follows. Rest of table was correct. We apologise for any inconvenience.

WIA DXCC Standings

(335 entities) (31st. Dec. 2004)

Callsign	Countries	Callsign	Countries	Callsign	Countries	Callsign	Countries
Honour Roll(326) Phone		General listing-Phone		Honour Roll(326)CW		General listing-Open	
VK5MS	335/369	VK3CIM	254/258	VK3QI	334/346	VK3JI	322/351
VK4LC	335/382	VK8DK	253/254	VK6HD	333/354	VK6RO	320/327
VE6VK	335/372	VK2FHN	243/000	VK5WO	331/347	VK4DV	314/329
VK4UA	335/370	VK4AO	240/000	VE6VK	326/353	VK6LC	312/315

table continued in Amateur Radio January/February 2005

FT920 antenna tuner repair

Barry White VK2AAB

Recently my FT920 would no longer find the minimum SWR settings on the 14 MHz band. It was also unable to find the correct settings on other bands. It was becoming an annoyance so it had to be fixed

The tuner settings for each band are stored in an eeprom (electrically eraseable programmable read only memory). When reset, or first switched on, default settings are loaded into the eeprom. These settings give the designer's best guess for a starting point for the antenna tuner. When you press and hold the Tuner button the control board seeks the lowest SWR it can find. When achieved, the new settings are written into the eeprom.

First I looked for what modifications and other information was available on the FT920. I found an article under Hints & Kinks in QST for October 2001. This modification by Anthony Bowyer NT4X described symptoms similar to those I had seen on my tuner. Anthony, due to previous experience, believes that due to the high levels of RF in the compartment with the control board, the eeprom setting can become corrupted. His modification improves the bypassing of the 5 V line by installing a 330 µF 16 V electrolytic capacitor and a 47 nF ceramic on the control board. The electrolytic goes where C5547 is marked; the dot on the PCB indicates the negative connection.

Before opening the radio, make a record of any menu and memory settings that you may have set into the radio. Then restore all settings for the tuner to the default values by doing a reset of the processor. To do this, turn the power off, press and hold both GEN and ENT, and then turn power on again. This will reset everything. If the reset does not restore normal operation on all bands with a dummy 50 ohm load connected to coax socket A or B, then remove the top cover. You will find a power supply module at the top. Undo the mounting screws for this module and after placing some insulating material on top of the PA module the leads are long enough to turn the power module over on top of it.

I applied Anthony's modification but this turned out to be less than straightforward. Where Anthony's article refers to control board socket J5004, it should read J5504. The 47nF (or greater) ceramic capacitor is installed on the 5 V line between pin 1 and pin 8 of J5504 on the tuner control board. After several email exchanges with Anthony it became clear that there are two different versions of the control board. The control board diagram with my FT920 shows pins 6 and 7 being TURL and Ant B signals, with pin 8 being 5 V. However my interconnection diagram between JP5004 and J5504 shows these signals on pins 8 and 9 of J5504, with pin 6 being 5 V. The TURL and Ant B signals go to JP5001 on the main tuner board. In my radio the TURL signal is a blue wire. You can determine which version you have by checking where J5504 pin 6 goes. If it goes to JP5001 put the capacitor onto pin 8, otherwise put it on J5504 pin 6.

The control board modifications did not fix my problem, at least not all of it. The tuning problem was now present only on 18 MHz and above. This showed that the settings for 14 and 7 MHz, stored in the eeprom before doing a reset, were incorrect. So Anthony's modification was needed because the eeprom was being corrupted. But I had to look further to clear up my remaining troubles.

The relays closest to the side of the radio are used to select the adjacent inductors of the tuner. You will see jumper wires on the PCB near each relay. These wires go to the coils of the relays. Nearest the rear of the PCB are two relays without jumper wires. These are the 1.8 and 3.5 MHz relays. To check whether a relay is energised, measure the voltage on the damping diodes connected across its coil; these are mounted close against the coil terminal end of the relays.

You can use Table 1 to check the operation of the relays as you select the bands. Each vertical column represents the bit pattern of the relays that are energised for that band. Each relay is energized, and shorts out a RF inductor, when it has 12 Vdc on its coil. These are the default settings after a reset, with a 50 ohm dummy load on coax socket A. The pattern generally shows that the larger inductors are short-circuited by the relays as higher frequency bands are selected.

Relay (numbers) indicate numbers on the circuit diagram where different from the PCB.

From this I discovered that relay 5028 was the one that had failed in my FT920. It was not closing the contact when energised so the RF inductor was never removed from circuit. Its failure did not affect the 3.5 and 7 MHz bands, probably because the inductance is quite small at 21 MHz, where that inductor is

	Frequency Bands									
	1.8	3.5	7	10.1	14	18.1	21	24	28	50
Relays										
5014 (5013)	0	0	0	0	0	0	0	0	0	1
5025 (5014)	1	1	0	0	1	0	0	0	0	0
5026 (5015)	1	1	1	1	0	0	1	1	0	0
5027 (5016)	1	0	0	0	1	0	0	0	1	0
5028 (5017)	0	1	1	0	0	1	1	1	1	0
5029 (5018)	1	0	0	1	1	1	1	1	1	0
5019	0	0	1	1	1	1	1	1	1	0
5020	0	1	1	1	1	1	1	1	1	0
Tune Fail	N	N	N	N	N	Y	Y	Y	Y	N

Table 1

used. It may be used to improve the Q on 3.5 and 7 MHz. Note that 50 MHz has a separate relay and inductor, so failure on the other bands has no effect.

Finding a replacement relay was a problem. I did not attempt to get a relay from the distributors, as it would have been more expensive, even if they were in stock. The original relay is labelled "TAKAMISAWA JY12H-K 12 Vdc". It is a single pole, single throw relay with no normally closed contact. The nearest relay I found was at Altronics, in their catalogue as S4150, a DPDT relay.

To mount it you must cut off the extra pins, or as I did, drill extra holes in the PCB. Either way you will need to drill a hole for the common contact pin and bend it over towards the copper to make contact. The normally closed contact pin comes through the hole where the original common contact was soldered but this does not matter as it can be soldered in place.

It turned out to be an easier repair than expected, so don't feel nervous about it; have a go!

ar

WIA news *continued*

for Reconsideration filed today, the League called on the Commission to "reconsider, rescind and restudy" its October 14, 2004, adoption of new Part 15 rules spelling out how BPL providers may deploy the technology on HF and low-VHF frequencies. Asserting that the R&O fails to adequately take into account the technology's potential to interfere with Amateur Radio and other licensed services, the League called the FCC's action to permit BPL "a gross policy mistake." The R&O, the ARRL said, "represents a classic case of prejudgment" by an FCC that knew better but ignored evidence already at its disposal.

Roy VK6BO awarded the Order of Australia Medal for Service to the Community and Amateur Radio

Roy Chamberlain, VK6BO has been awarded the Order of Australia Medal for services to the community through amateur radio and the Travellers Net in the 2005 Australia Day Honours list.

Many will know Roy, particularly from the Australian Travellers net, on 14.116 MHz. Roy has been net controller for the last 16 years.

Peter Harrison, VK6HH, a long time friend of Roy said he could not think of anybody else who so richly deserves to be so recognised. "It gives great pleasure to know he has been awarded the OAM".

The WIA Board extends its congratulations to Roy.

ar

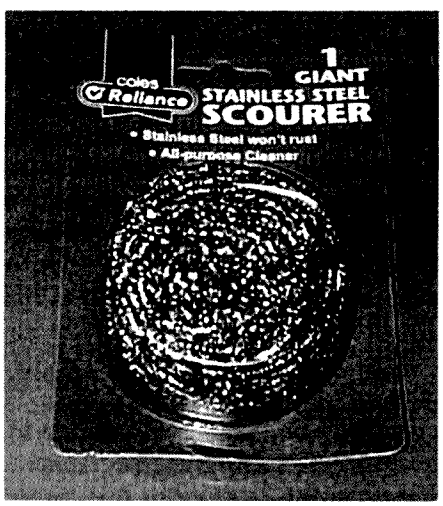
Suds to solder

A better way to get the lead out

Ian Jackson VK3BUF

I was flicking through a catalogue a short time ago, I saw an interesting product. It was a small enclosure with some fuzzy metal stuff inside. The caption said that it was for cleaning the grotty bits from the end of a soldering iron. Being a long time devotee of the damp sponge next to my soldering iron, I said 'Bah! Heresy! A dry sponge is like a boat without water, biscuits without milk, a light globe without moths! ' Scornfully, I turned the page in search of other products...

A week later I found myself in a supermarket – strange but true. While fighting to control the unguided inertia of a fully laden trolley, I spied a collection of brass and stainless steel pot scrubbers. After a brief spark of recognition, which may really have been a static charge from



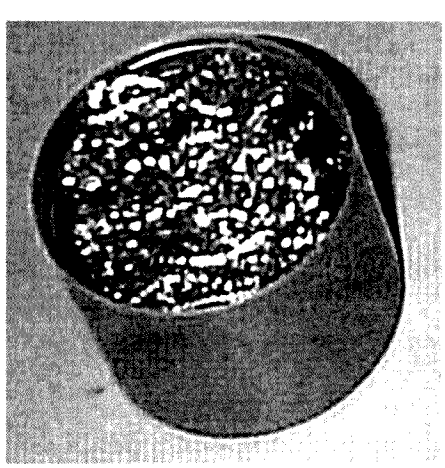
an over-waxed floor, I recalled that the scourers appeared similar to the contents of the aforementioned catalogue – at a fraction of the cost. I plucked a couple of samples from the little dangling bracket that implores customers to purchase things they didn't know they didn't want (it worked!) and vowed to prove its inferiority by experiment.

Another week later I had just commenced a soldering job and was confronted by a drought-stricken sponge. An invisible mission bell chimed in my head. It was Time. Ripping the scourer from the bubble pack, I thrust it into an inverted cap from a bug spray aerosol. The tip of the trusty Weller iron was well laden with oxidized solder spikes. I plunged the tip of the iron into the wiry mass. Without the usual cauterising hiss of a wet sponge, it came away clean and shining. With the shock of realisation one feels when first discovering that a product that is not butter, actually tastes like butter, I had learned that there was another way to keep my soldering tips clean.

Buoyed by this success I was tempted to experiment further. Replacing the stainless steel pot scourer with a similar looking brass one, I sought to optimise the process. Would the solder stick to the brass and make a lumpy mess on the surface? Indeed it did not. The solder broke up into tiny fragments and ozmotically worked their way to the bottom of the container forming a kind of sandy grit that gathered in the corners. After several to and fro trials between the products, I could find no discernable difference in the performance of the stainless steel and brass scourer products. Perhaps the brass seemed a little softer to work with.

All things come to pass, dinosaurs, the stump-jump plough, bottles of whiskey, and now the wet sponge.

ar



Another method of making "air-wound" transmitting coils

Drew Diamond, VK3XU,
45 Gatters Road
Wonga Park, 3115.

There are many factors which affect coil quality- or "Q". Early radio workers quickly found that one of the major considerations in the efficiency of practical coils is the type of dielectric material used for the coil former. All dielectric losses associated with the coil, including any insulation upon the wire, will add to the effective resistance of the coil (Ref 1). In HF work, a helix of more than a few turns usually requires some kind of former, or mechanical support.

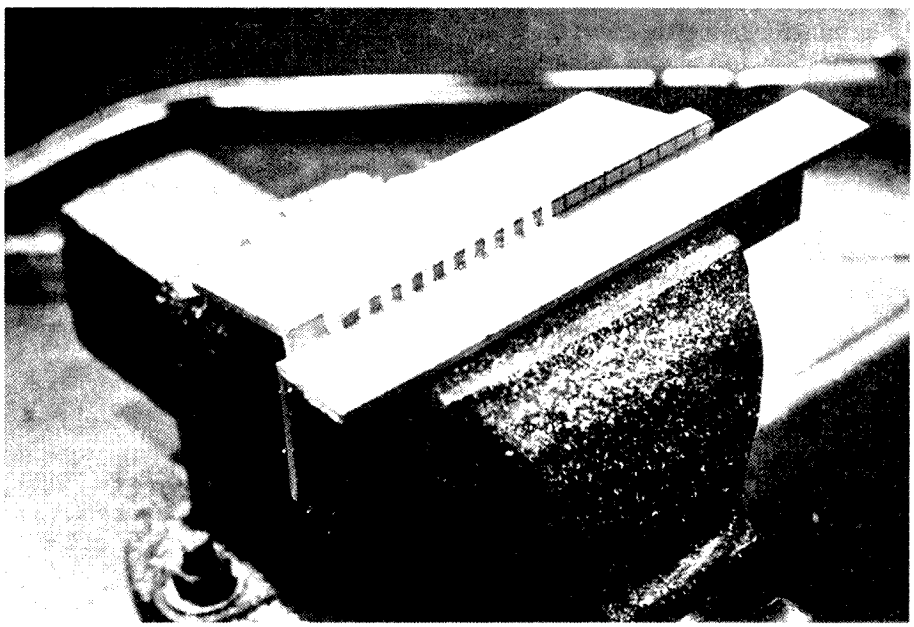


Photo 1. Slotting a rib in the vice with soft jaws

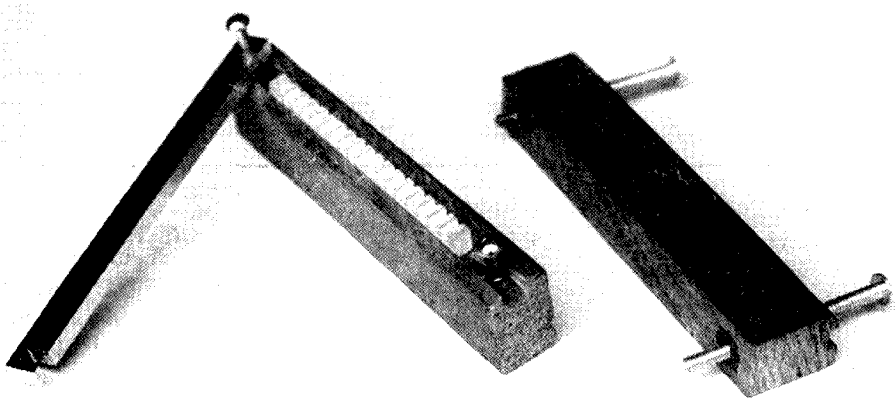


Photo 2. The coil jig

Such inductors should be wound with plain or enamelled copper wire (or tubing or strip) upon a former using the minimum of dielectric material.

For devices such as the popular Z-match, which uses a coil of relatively few turns, the pre-drilled Perspex method may be employed (Ref 2). But the job becomes increasingly difficult for coils of more than about ten turns.

Various methods have been described for making so-called "air-wound' coils. The name is not strictly accurate, because strips or rods of insulating material (usually polystyrene or Perspex) are fitted along the coil's length for support, or a piece of Perspex sheet is incorporated into the winding (Ref 3). This skeletal approach gives good rigidity, yet adds the least amount of superfluous dielectric material (Refs 4 and 5). Another (perhaps easier) method is offered here, which allows the amateur to fabricate coils of similar style to the familiar Air-Dux and B & W patterns.

The most often quoted formula for calculating the inductance of reasonably proportioned (i.e. not too long or short) single-layer solenoids is;

$$L\mu H = \frac{N^2 \times r^2}{9r + 10l} \quad \text{(Ref 6)}$$

Where N = number of turns, r = coil radius in inches and l = winding length in inches.

For younger readers more used to metric units, the formula becomes;

$$L\mu H = \frac{N^2 \times r^2}{25 \bullet 4 \times (9r + 10l)} \quad \text{(Ref 3)}$$

Where N = number of turns, r = coil radius in mm and l = coil length in mm.

This writer has found that the formula gives results within about 10 % of measured value at 1 kHz (where most

"laboratory" bridges work), but may be as much as 20 % out when the inductance is measured at radio frequencies.

Note that wire gauge is not in the equation. Obviously however, for moderate to high transmitting power levels (indeed, at any transmitting power level), wire diameter should be as near optimum as possible (Refs 7 and 8).

My apologies in advance for mixing Imperial and metric measurements in the following example, where an inductance of 13 microhenries is constructed for a pi coupler project. Applying the formula; it is found that 18 turns of #13 B&S/15 SWG (1.9 mm) enamelled wire, winding length 3.5 inches (889mm), 1.375 inches (35mm) radius yields an inductance of about that value. By spacing the turns we significantly reduce the inter-winding distributed self-capacitance (more ideal for vertical antenna loading coils), and in practical terms, allow tap connections to be more easily made (a desirable feature in ATU/couplers and PA tank coils).

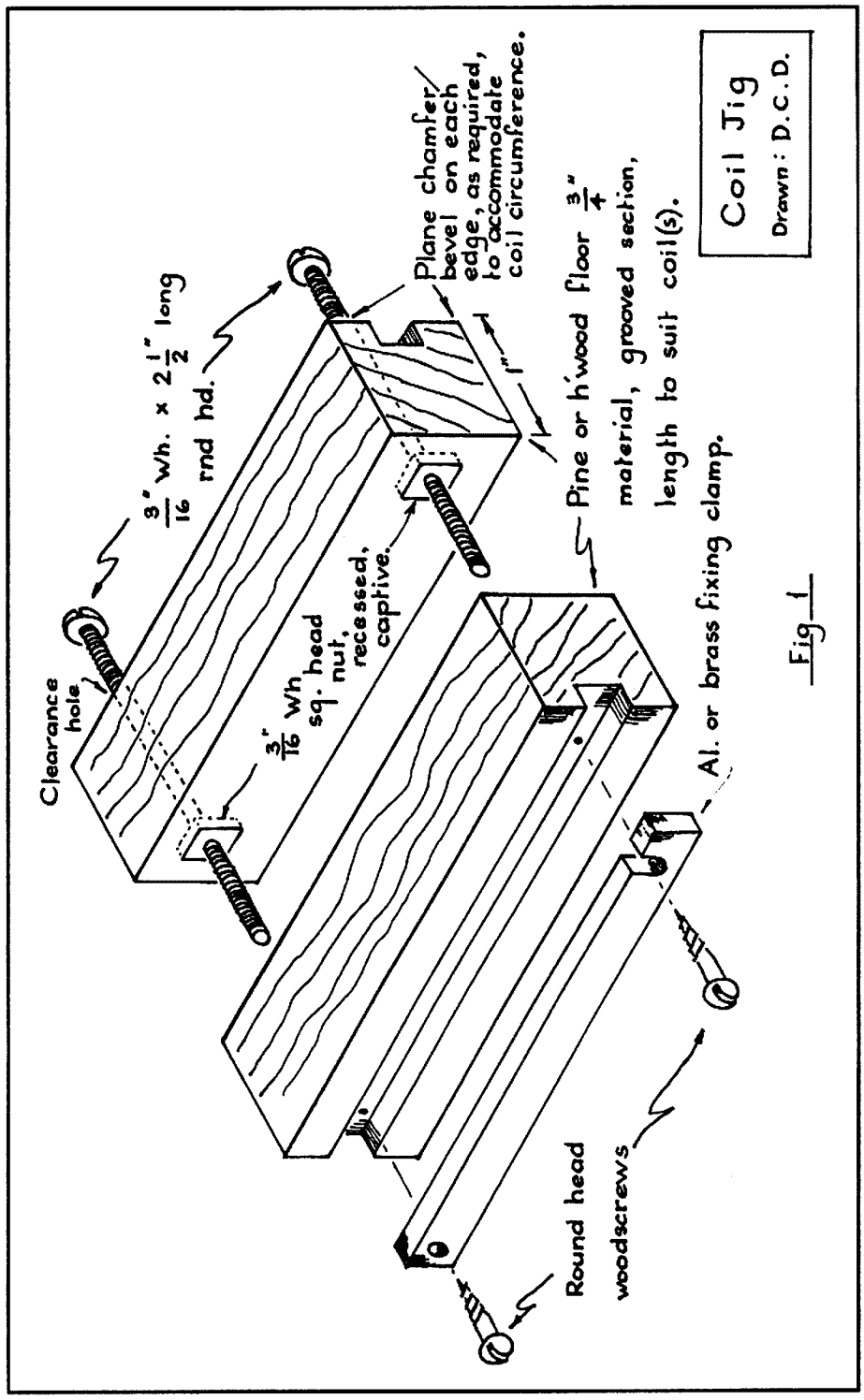
The jig

Our helix is accommodated upon two ribs made from pieces of 1/4" thick Perspex material. Round Perspex rod or other low-loss material would also serve. For our 18 turns we need 18 slots. In this example, spacing between turns is 5 mm, i.e. the winding "pitch" is 5 mm. A 95 mm length rod is accurately marked out accordingly.

A rod-saw fitted into a hacksaw frame is an ideal tool for cutting the slots. Photo 1 shows a rib clamped between scraps of extruded aluminium in my vice whilst sawing the 18 slots. Note how the soft jaws provide a depth stop, thus assuring an even depth for each slot.

Illustrated in Fig 1 and Photo 2 is a suggested form of jig for holding the helix. The wood parts are cut from the groove section of ordinary floorboard material. As most transmitting coils are over 2 inches diameter; they may each have a width of about 1 inch (25mm), length according to planned coil work. That shown is 6 inches (150mm) long. A bevel or chamfer should be planed on their outside edges as noted on the drawing.

So that the ribs may be held apart at the coil's diameter preparatory to gluing, pair of 3/16" (5mm) Whitworth screws is fitted as shown. Their square head nuts are held captive in shallow



recessed holes. They may be glued there, or simply pressed in for a snug fit inside the holes, whose diameter is just a tad less than the nut diagonals.

In order that the helix may be held captive whilst inserting the second half of the jig, a corresponding length of aluminium or brass rectangular rod is fitted with wood screws to one half, as shown. Note the cut-away hole in the rod- which speeds up the clamp/release operation.

Winding the coil

When a helix is wound upon a mandrel, the diameter will increase (spring outwards) by about 15 % when removed. In our sample coil, where a diameter of 2-3/4" (70 mm) is required, the helix is initially wound upon a mandrel of about 2-3/8" (60 mm). A rummage through your re-cycle bin should produce (say) a bottle of the necessary diameter for use as a mandrel.

In this instance, a bottle of about 60 mm diameter would be ideal. Calculate the length of wire required; π x d x number of turns: - 3.14 x 70 x 18 = 3956 mm rounded to 4 m. Clamp one end of the wire (or the spool) in a vice, then extend the wire to its full length, with a bit to spare. Leaving a tail of perhaps 6" (150 mm), fasten the wire onto the mandrel with sticking tape. Whilst keeping the wire taut; walk towards the vice and wind on the required number of turns as you go. My completed winding-or helix is shown in Photo 3.

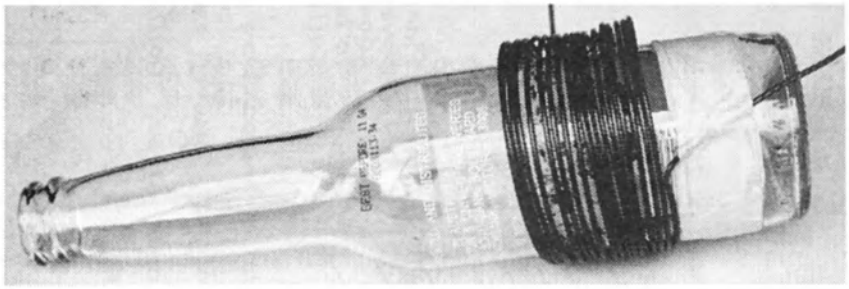


Photo 3. My mandrel

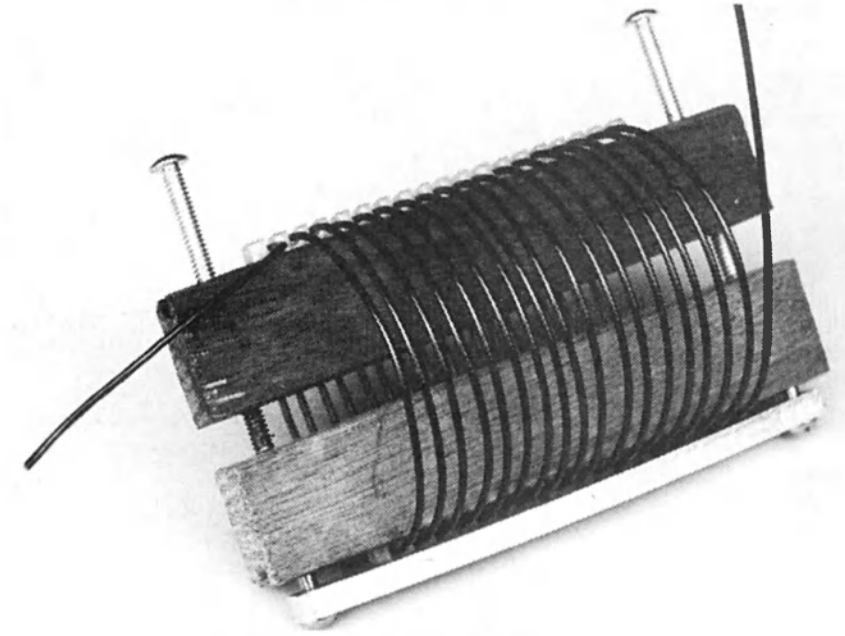


Photo 4. The coil ready for gluing

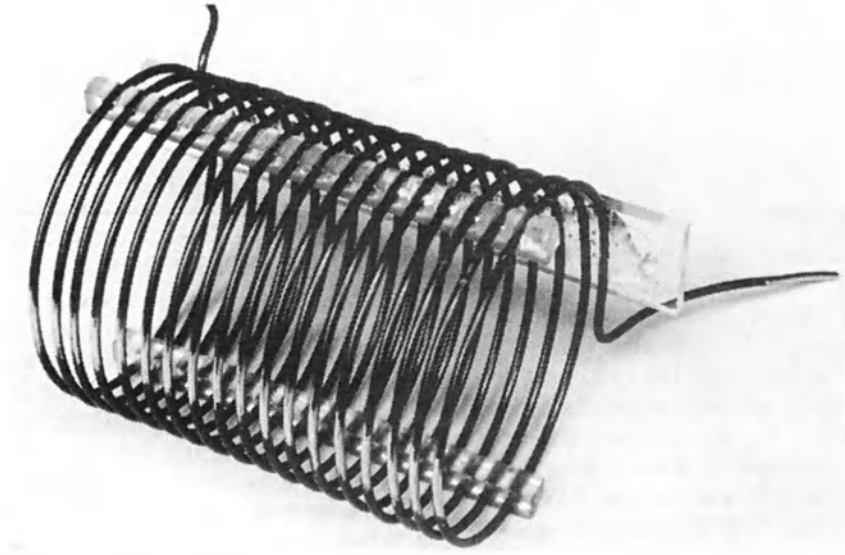


Photo 5.The finished coil

Using the jig

A slotted rib is installed into the groove as shown in Photo 2, then the jig half is placed inside the helix, whereupon the turns may be carefully juggled into each slot. When they are nicely bedded, the clamp may be swung across and secured in place.

Install the second rib in the other half of the jig, which may now be inserted inside the helix. Partially take up the slack by turning the screws until they begin to bear upon the opposite half. It should now be possible to carefully juggle the turns into their respective slots. When they are in position, the two screws are further advanced, thus securing the helix. See Photo 4.

Swing the clamp bar to one side, and then carefully and sparingly apply a bead of epoxy glue along the ribs, whereupon the glue should wick down into the slots. Immediately position the assembly vertically so that any excess glue runs down and drips off the ends of the ribs.

When the glue has set, slacken off the two tensioning screws and remove the jig assembly, thus freeing the coil. My completed coil is pictured in Photo 5. An additional Perspex rectangle has been glued upon it so that the coil may be fitted onto insulated posts, as part of the pi coupler project.

References and further reading

1. "Dielectric Losses in Single Layer Coils"; W Jackson, Experimental Wireless, May 1928, pp255 - 258.
2. Radio Communication Handbook (RSGB), 4th edn. p13.36.
3. "Making Air-Wound Coils for HF"; Diamond, Amateur Radio, June 2000, pp6 - 8.
4. "Low-Loss Low-Cost Transmitting Coils"; Muldoon, W1FRQ, QST Dec. 1934.
5. "Constructing Air-Wound Coils"; Johnson, W7KBE, Ham Radio (USA) Aug. 1984.
6. Radio Engineers' Handbook; F Terman, 4th edn., p55 (excellent reference).
7. "The Q of Single-Layer Air-Core Coils"; G Murphy, VE3ERP, QEX, Sep/Oct 2001 pp 33- 37.
8. Radio Data Charts; Beatty & Sowerby, 4th edn, Iliffe/Wireless World.

ar

Wrong place, right time

An amateur radio DXpedition team suddenly finds itself providing emergency communications in Andaman and Nicobar Islands during the recent earthquake/tsunami disaster

Mrs. D. Bharathi Prasad VU2RBI

Amateur radio DXpedition is a radio sport activity for HAM Radio operators worldwide and HAMs conduct expeditions to various islands with an aim to contact more distant countries. These expeditions with continuous operations help in studying propagation conditions, conducting research work in wireless activity with state-of-the-art equipments held by HAMs. It would also prove capabilities of Indian HAMs to reach out to millions of people across the globe by establishing direct radio contact with as many people as possible, which in turn promotes international understanding and tourism.

The NIAR DXpedition team: L to R: R. Sarath Babu VU3RSB, D. Varun Sastry VU3DVS, D. Bharathi Prasad VU2RBI, D. N. Prasad VU2DBP, S. Ram Mohan, VU2MYH

A team of five Amateur radio operators under the leadership of the undersigned, Mrs. D. Bharathi Prasad (VU2RBI) with other hams with call signs, VU2DBP (D.N. Prasad), VU2MYH (S. Ram Mohan), VU3RSB (R. Sarath Babu) and VU3DVS (D.S. Varun Sastry, aged 15 years and the youngest of all) was permitted by Department of Telecommunications, Ministry of Information and Technology, Government of India to proceed to Andaman and Nicobar Islands on a DXpedition of Amateur Radiocommunication from 3rd to 31st December 2004 with special call signs of VU4RBI and VU4NRO. National Institute of Amateur Radio (NIAR), an NGO with its headquarters in Hyderabad, which is promoting the subject of amateur radio communication in the country and Ministry of Information Technology, Government of India, have sponsored the DXpedition.

Team leader Mrs. D. Bharathi Prasad VU2RBI

The DXpedition was formally inaugurated by Honorable Governor of Andhra Pradesh on 25th November 2004. Team members met in the headquarters of NIAR to select the equipment needed for the communications from NIAR's inventory before proceeding to Port Blair. The equipment comprised high frequency transceivers, yagi antennas, vertical antennas, dipole antennas, masts, amplifiers etc. The team arranged for packing of the same for safe transport to Port Blair. It was also decided about the frequencies of operation and modes of operation for communication. Several of us including me proceeded by air and reached Port Blair on 1st December 2004 and the rest of the members and other technical assistants of NIAR came by ship from Chennai on 2nd December 2004.

On reaching Port Blair we met the local authorities including Chief Secretary, Govt. of Andaman and Nicobar; Secretary, General Administration and other functionaries including the Principal, Govt. Polytechnic College and explained to them about the expedition. Chief Secretary desired that a station should be established in the Science Centre where students would understand the amateur radio communication in addition to a station in Polytechnic College and if possible to go over to some other Islands also. They have extended complete

support to the team. One station was erected in Govt. Polytechnic College, the second in the hotel premises where some members were accommodated and the third in the Science Centre.

In addition to the support extended by the local administration, the officers of the Army Signals Unit of Port Blair have also extended their cooperation to the team by sparing the technical manpower to help erect the antennas and also for some local logistics. Erection of yagi antennas and dipole antennas was very interesting. It took almost two days to assemble the seven element tri-bander yagi antennas and for their erection. Dipole antenna erection was comparatively easier.

In the early hours of December 26, while the other guests in the hotel were fast asleep, I was continuing with my DXing with the usual spirit and was talking to an Indonesian ham. All of a sudden, I felt tremors at around 6.29 am, realised it was an earthquake, shouted "tremors" into microphone and rushed out of the room raising alarm alerting others.

Mr. Suri, the chairman of NIAR, K4VUD, Mr. Charles Harpole and Mr Henry, SM0JHF visited us after 15th December and inspired us with their experiences and some ham demonstrations for local people at science center, Port Blair. The antennas shipped by German DX Foundation arrived in Port Blair around 15th December and the same were useful specially for WARC bands.

Following frequencies (in Megahertz) and modes were operated by the team members.

PSK	CW	SSB
(Through Computer modem)	(Morse code)	(Micro-phone)
7.03	3.510	3.795
14.071	7.010	7.060
21.071	14.010	14.190/14.285
—	21.010	21.285

These frequencies are operated as per the Indian rules and regulations. Propagation wise 7 megahertz was open from about 3.00 A.M. to 8.00 A.M. for distant (dx) contacts and from 9.00 A.M. onwards 14 MHz/18 MHz/21 MHz/24 MHz/28 MHz were active for SSB/CW. The propagation was observed through east covering all the eastern countries including Japan and back to west covering European countries. After 6.00 pm onwards, North was used for communication purposes. It was possible to contact long distance stations even with simple dipole antennas due to seacoast.

It was a pleasure talking to hundreds and hundreds of radio amateurs round the globe and controlling the pileup each day of the expedition. Some times it used to be difficult in catching up with low power operators as high power operators used to 'hijack' the situation. However, I have taken every care to exchange reports with such low power operators including mobile operators. I have operated the radio from early hours of 3.12.2004 to early hours of 26.12.2004 for DXpedition with hardly three to four hours of sleep a day and made about 23,000 contacts individually with almost all the countries and including other team members we have made a total of about 35,000 contacts before the earthquake and the associated tsunami struck our location in the wee hours of the 26th December, which was terrible. We have communicated through almost all the modes mentioned above.

The DXpedition suddenly changes

In the early hours of December 26, while the other guests in the hotel were fast asleep, I was continuing with my DXing with the usual spirit and was talking to an Indonesian ham. All of a sudden, I felt tremors at around 6.29 am, realised it was an earthquake, shouted "tremors" into microphone and rushed out of the room raising alarm alerting others.

All the occupants of the rooms rushed out and gathered in the lawns of the hotel building. Immediately, after the tremors, my team members from their shack rushed to my hotel and joined me and by God's grace we were all safe. After about half an hour, I went back to the radio shack and checked for the antenna on the rooftop, which was disturbed by the tremors and had to be re-erected. There was no power and the hotel management put on the generator. Immediately, I went on air and contacted hams from Thailand (HS0ZAA, Mr.John) and main land of India (VU2UU, Mr. Shanker from Chennai; VU2MYL, Mrs. Rama from Hyderabad) who have confirmed the tremors in their locations as well. I could guess the magnitude of the damage due to the earthquake and decided to suspend the DXpedition operations and start emergency communication with the mainland (VU) and other people from then onwards by turning the antenna beam to mainland.

The telephone lines went out of order and within a few hours, we had come to know the extent of damage in Port Blair through local people. While the news of death and devastation caused by the tsunami/earthquake in other parts of India was quickly transmitted around the world, the situation in Andaman and Nicobar Islands was not known. I went on broadcasting information about the situation to anyone who could hear my signals. Simultaneously, I sent my team members to the office of the Chief Secretary, Government of Andaman and Nicobar Islands expressing our willingness to extend our support for establishing emergency communication for the help of administration. The Deputy Commissioner (DC) requested our services on 27th December and we immediately established a radio station in control room of DC's Office on 27th itself, operated by me and VU3RSB. At the request of DC, two of our team members (VU2MYH and VU2DVO) proceeded to Car Nicobar Island on the morning of 28th December in a military aircraft and established communication between Port Blair and Nicobar.

We were to handle hundreds and hundreds of messages each day from mainland and the affected areas due to the collapsed communication infrastructure and ours was the only link for thousands of Indians and other country people who were worried about their friends and families in the Islands. Also, our station in the control room became the centre of messages between Port Blair and Nicobar Island. Survivors in Car Nicobar were communicating with their relatives in Port Blair through our stations. Other hams of the country located in the mainland have helped us in relaying the messages whenever there was skip between our stations in the Islands. When telephone lines were restored on Tuesday, 28th December,

the information received on radio about the survivors from Car Nicobar was conveyed to their anxious relatives on the mainland that they were alive. We have also helped about 15 foreign tourists including several from US to send news to their families. At the request of DC, one of our team members (VU2JOS) was sent to Hudbay Island along with other Government officials for relief activity. The common man was totally happy in utilizing our service and the magnitude of their satisfaction on receiving the information about the welfare of their kith and kin is beyond one's imagination. We were not brave enough to sleep inside the hotel rooms during nighttime and were sleeping in the open air in the lawns of the hotel. Tremors continued all along the six days of my stay after the tsunami and even afterwards. Mr. Charles Harpole, K4VUD of USA and Mr.Henry from Sweden both visited our shack during DX-pedition. Also Mr. Charles observed our handling of emergency traffic on 26th December and left for Thailand on 27th December.

I continued emergency communication till the forenoon of 1st January 2005, the day of my return to Delhi. However, my team members are continuing in Port Blair, Nicobar and Hudbay Islands and few more have joined from NIAR on 2nd January 2005 for proceeding to other Islands which have no other means of communication.

Though we went to Andaman and Nicobar Islands for DXpedition, the circumstances have led us to conducting emergency communication, which was a sheer coincidence. The representatives of different media agencies including Associated Press, Washington Post, Zee News, etc. have witnessed our service to the society in the need of the hour through amateur radio and acknowledged the same. I am also thankful to them in spreading the awareness amongst the public about amateur radio communication. The potential of amateur radio communication in bringing people together is thus established once again.

I am proud of my team who extended all the support for the operations during the period of my stay in Port Blair.

I left Port Blair with heavy heart for the departed souls.

The following stations are operating in Andaman and Nicobar Islands as of 7.1.2004:

Station Call sign	Location
VU2LIC	DC's office, Port Blair
VU2LFA	APWD office, Port Blair
VU3RSB	Nehru Yuvak Kendra, Port Blair
VU2MYH	Port Office, Nicobar Islands
VU2DVU	"
VU2DSV	DC's office, Nicobar Islands
VU2MCK	"
VU2JOS	Hudbay Islands
VU2CPV and others	Cambel Bay islands
VU3VCC	Naval Base, Cambel Bay
The following stations in mainland are assisting the above stations in Islands:	
VU2RBI	New Delhi, (she was in Port Blair from 1.12.2004 to 1.1.2005)
VU2HFR	Kolkata
VU2PEB	Kerala
VU2HIT	Mumbai
VU2MUE	Delhi
VU2DBP	Delhi

I am thankful to Government of India for permitting me to conduct the DX-pedition, particularly, the authorities of Ministry of Information and Technology and the National Institute of Amateur Radio for sponsoring the DXpedition. I am also thankful to fellow hams worldwide that have made the DXpedition successful through their individual efforts and those who helped in conducting emergency traffic.

The potential of amateur radio communication in bringing people together is thus established once again. I am proud of my team who has extended all the support for the operations during the period of my stay in Port Blair.

(Mrs. D. Bharathi Prasad, VU2 RBI)
Chief Coordinator, NIAR,
New Delhi.

ar

Multiband magnetic loop

160 – 15 metres from your coffee table

Peter Parker VK3YE
6/16 Kokaribb Rd, Carnegie, 3163
Web: http://www.qsl.net/vk3ye

Will I cause interference? Would I upset the neighbours? Will I need a planning permit? Will the council or body corporate object? Or are my transmitting days over because I've moved into a unit?

These and similar questions must have gone through the minds of countless amateurs, who when moving house, are wondering whether they can retain their interest or be forced to give it up.

In this article I will show that in 99% of cases, the answer to the questions above is NO! House or flat, ground floor or top, balcony or no balcony, earth or no earth, you'll be able to make contacts on any HF band. And that includes 160 metres!

This article describes an easy to build magnetic loop antenna to get you back on the air. It offers continuous frequency operation between 7 and 21 MHz, plus the 1.8 and 3.5 MHz amateur bands. It will work indoors or outdoors and access to an earth ground is not required. On receive the antenna's null can lower local noise, while on transmit its high-Q suppresses spurious signals and reduces TVI risks.

Any spot that's roomy enough for a person can accommodate a magnetic loop. And unless you've enough loft space to string dipoles in the attic, or a high balcony rail on which to mount whips, this antenna will do better than most other 'limited space' antennas, giving near-dipole performance on the higher HF bands. Provided care is taken in construction, the results are repeatable and are well documented by amateurs worldwide who use magnetic loops daily for local and distant contacts.

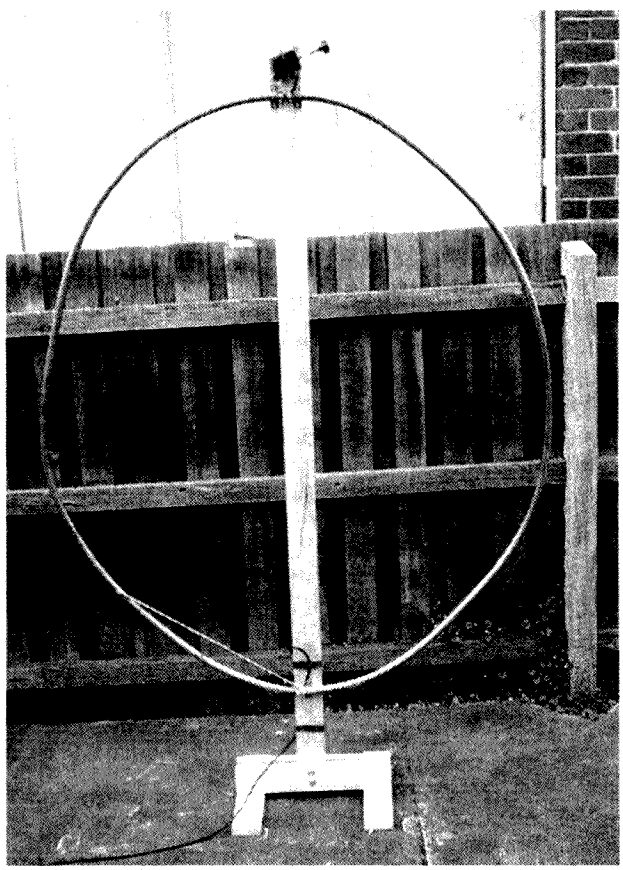


Photo One: Full view of the magnetic loop

1.0 Description

The whole antenna stands approximately 1.8 metres tall. It comprises a 4.2 metre length of 19mm copper tubing bent into a circle. A timber stand and base support the loop. The antenna is basically a giant tuned circuit that is brought into resonance

on the operating frequency.

A dual gang variable capacitor adjusts the loop's resonant frequency from below 7 to above 21 MHz. To reduce resistive losses introduced by the capacitor's wiper contacts, the gangs are effectively connected in series, and the frame left floating. Parallel capacitors are wired across the loop's ends to lower resonance for the 1.8 and 3.5 MHz bands. The coaxial feedline is coupled to the antenna via a length of thinner brass or copper tubing.

Most materials can be purchased at a hardware store. The loop can be built in an afternoon, requires only hand tools to assemble and costs less than eighty dollars to construct.

2.0 Design considerations

(those who just want to build it now can skip this section)

Band coverage

The main difference between this and other published designs is its frequency coverage. Most others have only a 2:1 or 3:1 ratio frequency range, with some operators using two differently-sized loops to cover all bands. Apart from the hassle of lead-swapping when changing bands, the extra construction effort, cost and storage space of two antennas made this option unattractive.

Though aware that efficiency falls on the lower bands and acting on the maxim that 'any antenna is better than no antenna', I decided that there was nothing to lose by adding 80 and 160 metre capabilities. As mentioned later, the results achieved were most gratifying, even on 160 metres. Given the current phase of the solar cycle, and the reduced efficiencies of a smaller loop, it was an easy decision to omit 10 and 12 metres and allow it to be slightly large for 15 metres.

Loop size

Two factors determined the maximum size of the loop. One is that the circumference of the loop should be

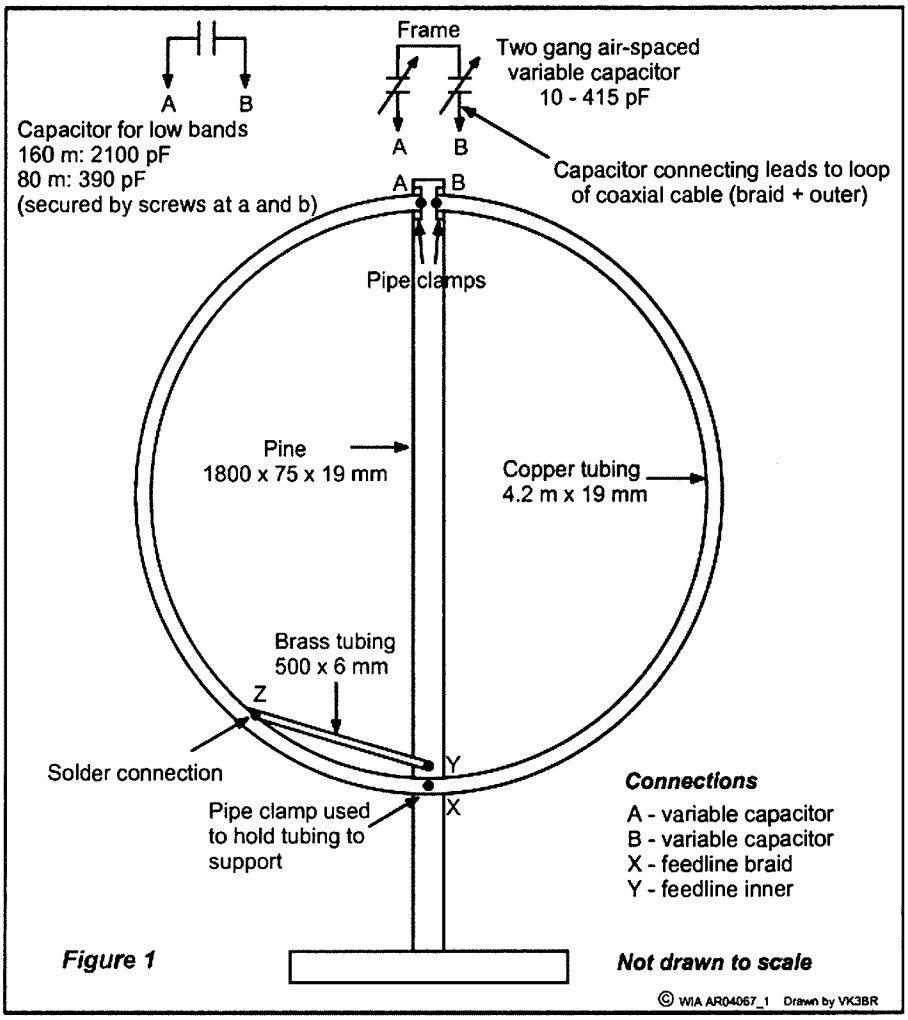


Figure One: Construction of the loop

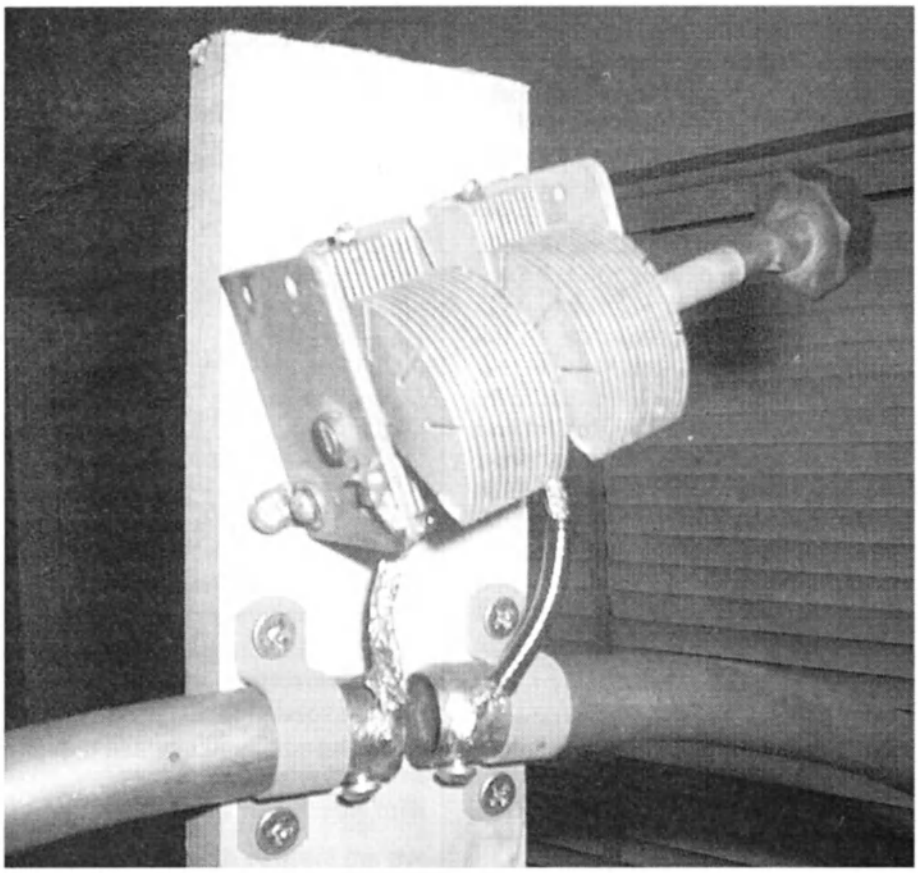


Photo Two: The loop's variable capacitor

less than a quarter wavelength at the highest frequency band to be used. If it's any more the antenna behaviour changes. Secondly, and assuming it will be used indoors, its height is limited to that of your front door if you'd like to be able to take it with you when you next move house.

The size constraints can be relaxed if you are willing to sacrifice the higher HF bands and/or can erect it outside. Even if you have only a small courtyard, it should be possible to fit a three metre diameter loop. This could give outstanding results on 40 metres, good results on 80 metres and improved performance on 160 metres. An upgrade to six metres diameter would do even better, providing performance competitive with full-size antennas, even on 160 metres. If the support pole is also used for parallel dipoles for 30, 20 and higher bands, the result would be an excellent multiband antenna system in little more space than is required for the 30 metre dipole alone, especially if you had motorised control of the variable capacitor.

Though the loop's nulls are deep, they are also narrow. Thus you could get away with leaving the loop in a fixed position, perhaps to favour a particular DX path or null out an annoying noise.

Loop construction material

19 millimetre diameter annealed copper tubing was chosen for the loop. This is self-supporting, can be bent by hand and is commonly stocked by hardware stores. The circular shape selected offers slightly higher efficiency than a square or octagon because it covers more area. The tubing was the most expensive part of this project, costing approximately $50. Two telescoping lengths of much thinner brass tubing (bought from a hobby shop) were used for the coupling to the feed line.

Variable capacitor

Some designs use vacuum variables but this approach was rejected due to their scarcity and expense. Instead a two-gang air-spaced variable capacitor, with the sections connected in series, was used. This has proved adequate for power levels up to at least 20 watts.

A vernier drive would be nice but was not added in the prototype. If you'd like to be able to control the tuning capacitor near the bottom of the antenna while getting some vernier action, try using a knob, spindle, string or fishing line and a dial drum from an old valve broadcast receiver attached to the variable capacitor.

Method of feedline coupling

I first used a small loop of coaxial cable within the main loop. This worked but its position needed to be changed for lowest SWR on each band. Thus the feed method was changed to that shown here, which does not suffer this problem.

Use of radials

This is suggested in the reference as a way of improving the loop's efficiency. Connecting wire radials made no improvement to the antenna's performance. They also create a trip hazard if used indoors. Thus they were omitted.

3.0 Construction

Construction should be almost self-explanatory from the diagram.

Start by cutting the copper tube to its required 4.2 metre length and hand-bend it to form a giant circle. The ends should be about 20 mm apart. Place this to one side.

Cut the pine plank to approximately 1.85 metres long. Place the offcut aside; this will be required later to construct the base.

Drill a hole at each end of the copper tubing to accommodate self-tapper screws. These holes will be separated by approximately 35 mm and form the mounting points for the fixed capacitor needed for 80 and 160 metre operation.

Clean the ends of the tube with sandpaper and tin with solder. The usual 20-30 watt soldering iron won't be enough, so use a cheap butane torch for this job.

Make two 50 mm jumpers for the connections to the variable capacitor. Thick copper strap would have been ideal, though tinned coaxial cable braid was used in the prototype. With the butane iron, solder each jumper to each end of the tubing at points 'A' and 'B'.

With the flame still burning, tin the lower centre section of the loop (point 'X'). Then with the electric soldering iron tin the RG58 feedline's braid. Use the butane flame once again to make a connection, but don't apply so much heat that you make a mess of the coax. Finally solder the 500 mm brass tubing between an appropriate spot on the loop and the

coaxial feedline inner (point 'Y'). If you don't have anything long enough, either use two smaller telescoping tubes or try brass welding rod. The experimentally inclined might wish to first use sections of coax braid and substitute the tubing only when they've found the optimum length for Y-Z.

Use three water pipe clamps and wood screws to mount the loop onto the plank. Two clamps are at the top (capacitor) end and one at the bottom (feedpoint) end. Allow enough overhang at the top of the support to mount the variable capacitor and at the bottom for the base.

Use the remaining timber to make a stable base. This should have a footprint of at least 400 mm square approx to stop the loop tipping over. The photos shows how this was done in the prototype. Use two large bolts to securely mount the stand to the base.

Solder both gangs of the variable capacitor to the free ends of the 50 mm coax straps at the top of the loop. Because we are using both halves of the capacitor in series the frame of the tuning capacitor is not connected to anything. Use small right-angle brackets to mount the variable capacitor to the pine support.

If the loop is to be used outdoors, take the time to prevent moisture ingress by (i) painting the timber before mounting the hardware; (ii) making a protective hat or box for the variable capacitor and the top of the stand and (iii) applying Silastic sealant around the feed point area of the loop.

4.0 Testing

Connect the loop to a 7 MHz transceiver. Adjust the variable capacitor until the receiver's noise level peaks. This should occur towards the maximum capacitance end (plates meshed) of the capacitor's rotation.

Repeat for the 10, 14, 18 and 21 MHz bands, again retuning for noise peaks. If noise peaks cannot be heard on the 21 MHz band it means that the minimum capacitance of your tuning capacitor is too high. Either try another variable capacitor or remove any parallel trimmers for a lower minimum capacitance.

Retune the loop and receiver to 7.1 MHz. Connect a VSWR meter between the transceiver and the loop. Apply a 5-10 watt carrier and watch the SWR meter. It should hardly budge. If it doesn't, adjust the transceiver's VFO until the lowest reading is indicated. Repeat the test to verify resonance on each higher band.

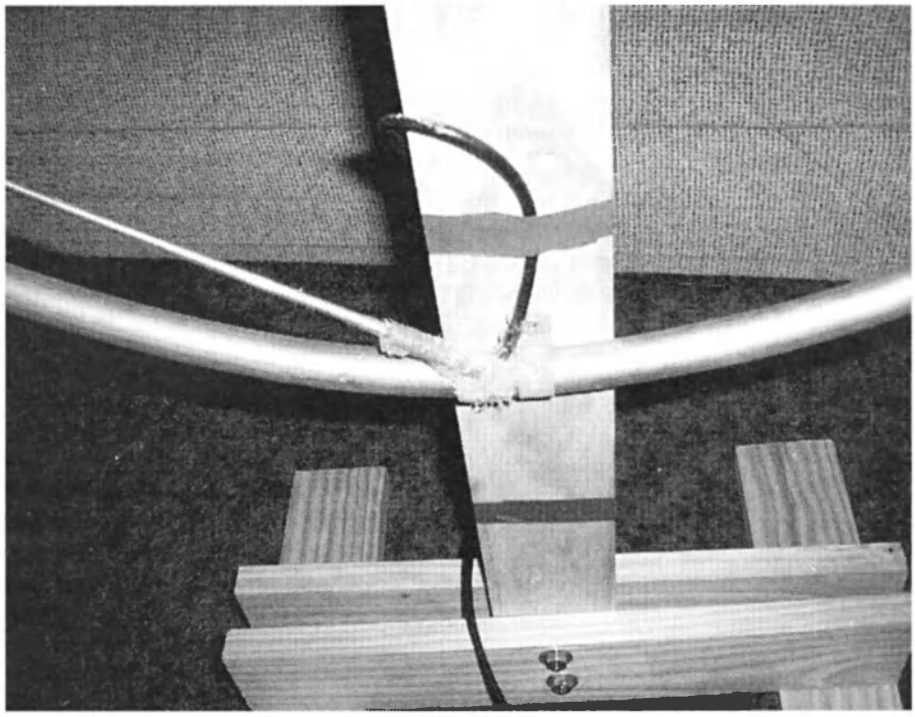


Photo Three: Feedline connections and base

If you cannot get an acceptably low reading, you may need to vary the length of Y-Z, possibly using some coax cable braid to find the optimum position for 'Z', after which you can substitute tubing or rod. Always remember that voltages on magnetic loops can be very high even with low transmit powers, and you should avoid touching the antenna whilst transmitting.

To reward your efforts, now get on air and make some contacts, which at this phase of the solar cycle are easiest obtained on 7, 10 and perhaps 14 MHz. Rotate the loop to use the null to reduce interference, and see how its sharpness depends on if the arriving signal is ground or skywave. It is also worthwhile to connect an antenna switch to compare the loop with any other antenna you may have.

After being satisfied that all is working on the higher bands, confound the sceptics by trying some 80 and 160 metre operating. Ferret around in your junkbox for high voltage capacitors that are of a type suitable for RF, such as silver mica. You need 390 pF for 80 metres and 2100 pF for 160 metres. If you lack these exact values, there is nothing wrong with paralleling several smaller values to make it up. Solder to terminals that suit the screws you've installed on the tubing across points A-B, near the variable capacitor. Again use a receiver and then a transmitter to verify resonance and low SWR on 1.8 and 3.5 MHz.

Have no suitable fixed capacitors but need 80 metres? Just short one of the gangs of the variable capacitor to the frame. Losses will be slightly higher (due to resistance between the capacitor's frame and rotor) and adjustment will be touchy, but it will still work.

5.0 Operation

The Q of this antenna is very high. This means that it can only operate efficiently over a narrow frequency range. Almost every time you change frequency, you will have to change the setting of the variable capacitor.

As mentioned before, this is done by peaking the capacitor for maximum received noise at the desired operating frequency. If the reflected power is high, make further tiny adjustments until it is acceptable. A resistive-type bridge (rather than a conventional SWR meter) is preferred because of the ability to tune up without causing interference.

Note that the loop is directional, with a sharp null when the element is facing the direction of the incoming signal. This makes its behaviour different from that of full-sized quad elements, where the null is off the sides of the loop. This directivity can be useful when nulling

out interference. It is also useful to remember when other stations report difficulty in hearing you, turning the loop may improve your signal.

6.0 Results

This has been the author's third magnetic loop. Each performed well, but this one has the most frequency span and is the most versatile. Loop antenna calculation programs indicate efficiencies varying between 0.25% on 160 metres, 17% on 40 metres and 92% on 15 metres.

The most rigorous comparison between the loop and a full-sized outdoor antenna was done on 80 metres during the 2004 VK/Trans-Tasman 80 metre SSB contest. Two hours operating into an end-fed inverted-L wire in a local park was followed by a similar time with the magnetic loop in a noisy ground floor apartment. Five watts was used in each case. Results were as in the following table:

	Inverted-L (outdoors)	Mag loop (indoors)
Operating time	1hr, 50 min	2hrs, 20 min
No contacts	57	36
Avg contacts/hour	31	15
No contacts to VK2	15	8
No contacts to VK3	20	17
No contacts to VK4	1	1
No contacts to VK5	8	5
No contacts to VK6	1	1
No contacts to VK7	2	4
No contacts to ZL1	2	0
No contacts to ZL2	4	0
No contacts to ZL4	4	1
Percent outside VK3	65%	53%
Percent VK6/VK8/ ZL	19%	6%

As expected, the full-sized antenna did better, but the loop was no slouch, achieving a respectable 15 contacts an hour. Many of the more distant contacts made with the loop would have been a struggle for the other station. However a small power increase to (say) 20-50 watts would have provided 'armchair copy' for these stations and the prospect of DX contacts provided the receiving environment was sufficiently quiet.

Buoyed by the results on 80 metres, attention was turned to the more challenging band of 160 metres, where the effective radiated power is merely milliwatts. After a suitable value of capacitance was arranged the loop was successful here too. SSB and CW contacts have been made throughout Victoria with 5 watts to the indoor loop, though to be fair most have been fairly marginal. However during the day the loop has performed well on the morning nets, with ten watts AM being solidly readable out to over 10 kilometres, with reports received up to 30 km away.

40 and 30 metres provide better prospects for interstate working, with many amazed at signals received. Expect reliable contacts out to about 1000 km during the day and 3000 km around dusk. 20 and 17 metres are good for even longer distances, with multihop paths to Europe and North America sometimes being workable, even with low power.

I should also mention two things first-time loop users will notice; one bad, the other good. The bad is that due to the loop's small capture area, fading on signals is more marked than on larger antennas that provide a measure of reception diversity. The other observation is that magnetic loops, even if low to the ground, seem to radiate equally in all vertical angles (including the low angles so important for DX). This contrasts with a half-wave dipole, which at normal heights mostly radiates straight up (at least on the lower HF bands). Where it is not possible to erect a high dipole, a low magnetic loop could well outperform it, especially in situations where the loop's efficiency is reasonable, such as on 30 metres. Another case where small loops could outperform many low horizontal wire antennas is for local ground wave work on 160 metres, though the loop described here is too small to test this theory.

7.0 Conclusion

A compact magnetic loop covering most HF bands has been described. It's easy and cheap to build, provides excellent results for its size and will let almost anyone who claims that they 'lack space for antennas' effectively get on air.

Reference:

ARRL Antenna Handbook 18th Edition, 1997, p5-11ff

ar

Those bargain portable generators

Steve Mahony VK5AIM,
19 Kentish Road,
Elizabeth Downs, SA 5113.

Small 240 V ac portable generators are now available from some stores around Australia at bargain prices.

These small portable 240 V ac generators were very attractive to amateur radio operators. For those of us who delight in Field Days, portable radio trips and even WICEN activities, they look to be able to solve the power supply problems. Rated at 240 V ac 50 cycles, 750 watt and higher, they could run the average 100 W SSB HF and VHF equipment easily. The price being from $100 makes them attractive and affordable to AR budgets.

Some people queried the quality, with them being manufactured in China. How long would they last? For the tradesman using the unit 7 days a week, 50 weeks a year, No! For the average Amateur using the unit for Field Days, portable trips and supplying the home station during power failures, I would expect them to last for many years, with proper maintainence.

The generators come in many brand names, some well known, others just a name. Visual comparisons and reading the info on the cartons indicate that they are all alike, with some minor differences and prices.

In QSOs with other amateurs, I confirmed that many of these generators have been purchased, With the amateurs' ability to modify, improve and understand the workings of their equipment it would be good to know of these improvements and modifications.

How about it fellow amateurs?

A well known VK5 amateur who was employed most of his working life by the SA Power authorities bought one of these generators when he saw them at this price, "To good to miss' was his comment. He tested the unit thoroughly and could find no fault with it. 240 V ac +/- with no load, 50 cycles +/- a few cycles. The power available from the 750 W machine was 550 watts continuous and it would peak at the rated 750 watts. The ac wave shape was near sinuous with a few spikes, as observed on a CRO. It ran a load of lights OK and he believed it would run OK into the average mains transformer of a 240 V to 13 V dc PSU. As regards running into a switch mode PSU he did not know how it would perform. The 14 V dc is rated at 8 A, thermally protected, as is the 240 V ac. The dc is available at a standard 'T' type socket. It is suggested to be used for charging 12 V batteries.

Being a two-stroke engine it requires oil mixed in with the petrol. Unfortunately the mix is different from the usual lawn mower mix of 25:1. The generator requires a 50:1 mix. This means another container for this fuel mixture, Inconvenient but no great hardship. I am told the 50:1 mixture is for the new environmental /pollution standards.

My 750 W generator in operation

I ran my IC-735 transceiver via standard YAESU FP-707 PSU, on 80 m for a Group Net one evening. None of the other stations could tell the difference. I did run a 60 W 240 V incandescent lamp at the same time.

With the transceiver only on receive you could see a flicker in the lamp and hear the motor fourstroke as you went into transmit and spoke into the mike. You could see the lamp dim slightly and hear the motor settle down to a steady purr, on pauses in speech the motor changed note and the lamp flickered.

The generator was on the end of an extension cable 8 m away. With no signal in the receiver some ignition noise was audible. The Noise Blanker removed this. I am quite confident in running my AR station at home or portable on the generator. I ran 3 different electric drills of about 400 to 500 watts each in turn, on the generator. An Angle Grinder and a Jig Saw of similar wattages ran as well. The motor growled as you started the drill etc up but picked up and ran the tool quite OK.

I believe Colwyn VK5UE ran a small evaporative air conditioner and the TV /VCR off his generator quite successfully when we had a power failure in Elizabeth. I tried a small 14 inch, kitchen TV on the generator. It worked OK. A bit more load, say a 60 W lamp would load the unit up and keep the load constant. I

can visualize in the event of a major power failure, my wife asking me to get the generator out to run the TV, so she could still watch her "soapies".

Some minor improvements I have made to my generator

1 A proper earth terminal, green colour, to enable an earth wire to be easily connected to the chassis.

2- As the unit weighs 20 kg it can be lifted with care by one person. I made up a temporary wheeled cart with 4 ex chair castors fitted to a piece of thick chipboard and a pull along rope. A proper metal-framed trolley with respectable sized wheels would make it easier to move about. Any suggestions!

3 The single handle on the top of the fuel tank is only suitable for one person to lift it. I made a temporary 2 person handle with a piece of broom stick, slightly longer than the tank, and fastened it to the top of the handle with two stout screw type hose clamps. It works OK and two people can share the load lifting it into the back of a vehicle.

Any suggested improvements would be welcomed.

So to paraphrase the song. "The bush is alive with the sound of generators". What about it fellows? Hear you on the airwaves with the purr of a generator in the background for the next Field Day.

I write this article because on Fathers Day last, I was told by my wife and son to sit down at the kitchen table, make room on the table for a large parcel and close my eyes! There was the sound of someone carrying a heavy object and placing it on the table. 'Open your eyes" said the pair of them. This I did and there was this blue and white package containing a 240 V, ac, Generator. My Fathers Day present. I was delighted. There is a pun in that line!! Thank you again John.

ar

News from...

WICEN Victoria

WICEN (Vic) has completed another successful event with the Red Cross Murray River Canoe Marathon held between Boxing Day and New Year's Eve.

Approx 250 canoes were on the water over the entire event, with over 750 individual canoeists involved. Many were from various private schools and formed relay groups. This year, a "half marathon" was run which involved up to 25 canoes. The half marathon started at the second check point (Bravo) and went through to the finish. This section will be repeated next year, with the intention of attracting those canoeists who would like to participate, but who might find the overall length of 404 km a bit daunting.

This year we were a little short on numbers of amateur radio operators, however at the last minute we managed to successfully fill every check point. In total 23 amateurs were in attendance at various times, plus several helpers and observers.

New to the Murray was Ian Morris VK3DVO and from comments received he really enjoyed the stint. Also welcomed was Lloyd Morrissey harmonic of John Morrissey VK3ZRX. Lloyd was utilised as a "second operator" under supervision at various points, and he performed with excellence.

Our newest amateur was Kate Perry VK3HCL, who received her amateur licence only a few weeks previously. Kate is a most experienced WICEN operator, and with parents Ron VK3ECV and Marlene VK3JAW looking over her shoulder we had a real enthusiastic operator working for us. Kate was given mobile tasks on the safety boats, such as the "Screen" boat which heads downstream first to clear the river of other vessels, and the Water Safety Officer (WSO) boat which ends the chase of the canoes, and ensures no canoe has been lost or strayed.

This year, due to flooding of the river near Tocumwal, the first day of the event was repeated, that is canoes did the journey from Yarrawonga to Tocumwal twice, making the third day running as planned from Picnic Point to Echuca.

We camped two nights at Tocumwal, two nights at Echuca, and one night at Cohuna. Excellent meals were provided at modest cost by the Red Cross Catering Service whilst we were camping, and this saved us having to take along food supplies.

New Year's Eve was celebrated at Swan Hill where WICEN operators relaxed at the Pental Island Caravan Park. The weather was kind to us this year, and most of the WICEN camp wore heavier than normal clothes, breaking out into shorts and lighter sporting apparel on the last day Cohuna to Swan Hill, when the temperature reached 35 Celsius.

This year we utilised 80 metres almost exclusively, as we found that the early morning transmissions with 40 metres (which is our normal preferred operating frequency) were unreliable, even over the relatively short distances involved. However, conditions overall on 80 m were excellent both in the early morning and afternoon sessions, and in conjunction with our 2 metre frequencies used by the boats, we achieved a very high quality of radio communication, which was readily acknowledged by the Red Cross and Marathon coordinators.

It was during the third day of the marathon that we heard the news of the terrible devastation and loss of life caused by the tsunami. All volunteers were affected in some way, and on New Year's Eve, members of the administration team from the Land Rover Owners Club (LROC) took around the hat, and achieved donations of $2,800 which was handed to the Red Cross to assist with recovery work in the affected areas.

All in all a most successful 'Murray Marathon" was achieved, and we thank the Officers in Charge, Russell Park VK3FIN, and Bruce Bathols VK3UV for their untiring efforts in getting the group together and co-ordination of all checkpoints and stations.

We now look forward to Murray Marathon 2005.

Enquiries regarding WICEN Victoria may be directed to Bruce Bathols, VK3UV. Please email Bruce vk3uv@wia.org.au or phone 0418 386 030

Technical Abstracts

Peter Gibson VK3AZL

Remote dc power through your coax

The practice of remotely powering such items as masthead preamplifiers and satellite front ends via the coaxial cable has been common for many years. The practice has also been used in amateur service over the years.

However, an article by Phil Salas, AD5X in QST for July, 2004 reminds us that these techniques are useful for such purposes as remote operation of modern auto antenna tuners or antenna switching relays. As Phil is a keen portable operator who had just purchased an auto tuner to add to his equipment collection, the prospect of having to run even more wires between antenna and rig caused him to look for a better solution.

The system required a means of injecting the dc onto the coax at one end, extracting it at the other end, whilst keeping the rf and dc apart.

Injecting dc onto a coax requires that there be good isolation between the signal and the dc source, since the dc source will look like a ground, or short to the rf signal on the coax. Also, most dc supplies would not respond well to having large amounts of rf being fed into them. Therefore, you need a couple of dc blocking capacitors that have low impedance at rf and a good inductor that has high impedance at rf. The inductor must also be capable of handling the dc current required. The circuit of the dc injection module is shown in Figure 1 and the extraction module is shown in Figure 2.

The inductor used was a solenoid style with two layers of winding giving an inductance of 100 uH and a current capacity of 2 amps. When tested across the frequency range of interest, the inductor showed a series resonance at 11 MHz. As it was considered that 100 µH was more inductance than really needed, one layer of 25 turns was removed, giving a single layer winding of 25 µH. This gives sufficient isolation for 3.5 MHz and up and should even be adequate for 1.8 MHz. The capacitors used in this design for C1 and C3 are 500 V disc ceramics. The author obviously considers they are adequate for use with an IC706 transceiver. If it is planned to operate on 1.8 MHz, it may be useful to parallel a pair of capacitors at C1 and C3.

Some system protection is provided by the use of diodes, zeners and fuses, although these will obviously not be totally successful against a lightning strike or near strike.

The rest of the article is devoted to various methods of construction for both portable and fixed station installations as well as methods of testing and commissioning.

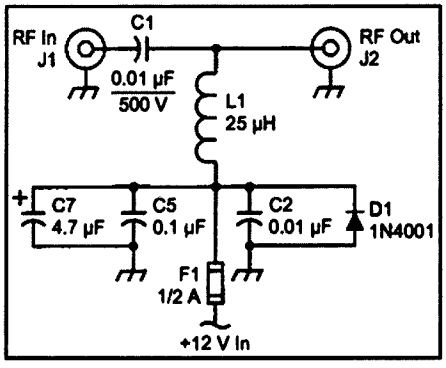


Figure 1 – The dc injection (send) module

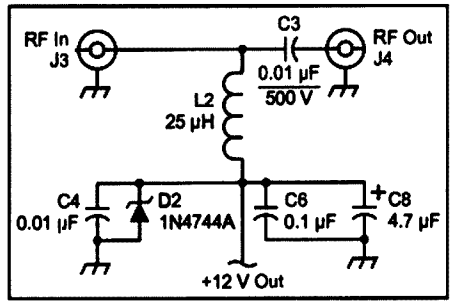


Figure 2 – The dc recovery (output) module.

Antenna mounts for all occasions

Have you ever needed to temporarily mount an antenna on a vehicle that does not readily lend itself to such operations?

In QST for November 2004, Pete Norloff, KG4OJT, and Tom Azlin, N4ZPT relate their experiences in solving such a problem when they needed to operate from a wide variety of vehicles of unknown type, being used in a civil defence exercise.

The requirement was to allow the use of VHF radios in vehicles ranging from school buses, small limo buses to large charter buses. One common factor in many of these types of vehicles is that the bodies are largely made of fibreglass, aluminium or other similar materials. Mag mounts will not stick to such materials and they do not provide a good ground plane.

After some thought, they decided to use suction cup mounts, in particular, the type that are used for lifting raised floor tiles or carrying sheets of glass. This lifter has two large (100 mm) suction cups with attach/release levers; connected by a handle.

A variety of antenna mounts and styles can be made from this basic support. If a flat plate of steel is bolted to the handle, a standard magnetic mount can be used. The drawing for this is shown in Figure 3 and a picture of one such unit in use is shown in Figure 4. Note that all of the horizontally mounted antennas have a 'rat tail' of several quarter wave wires attached to provide a ground plane of sorts.

If an L bracket is bolted to the handle, a bolt-on antenna can be mounted. If two sets of holes are drilled into the handle at right angles, horizontal or vertical mounting can be accommodated. In both of the above cases, the suction mount is mounted horizontally.

If the suction mount is attached vertically, then extension poles can be attached to support ground planes above the roof line. If the handle is cut

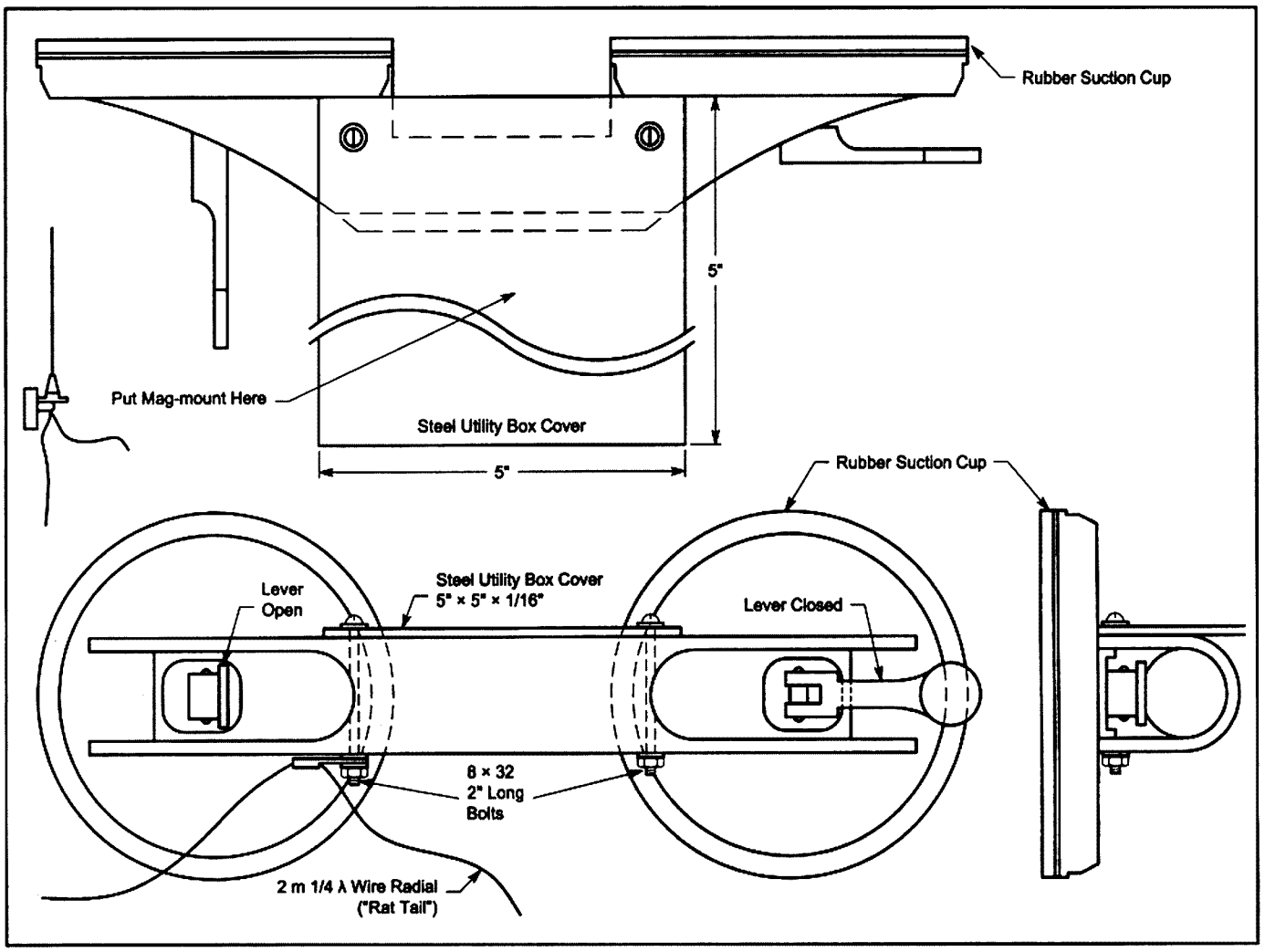


Figure 3 – Detail of the Mag Mount assembly

in half, the two suction cups can be spaced further apart with the joining rod holding them together.

Whilst this type of mount will stick to most windows or surfaces with little curvature, they can not be attached to compound curved surfaces such as many car front and back windows. However, most vehicles should have at least one suitable surface where this mount will fit.

The measured VSWR on most of the antennas was between 1.3-1.5:1 with the 'rat tails'. Adding the 'rat tails' lowered the VSWR to these figures from 1.8-1.7:1.

ar

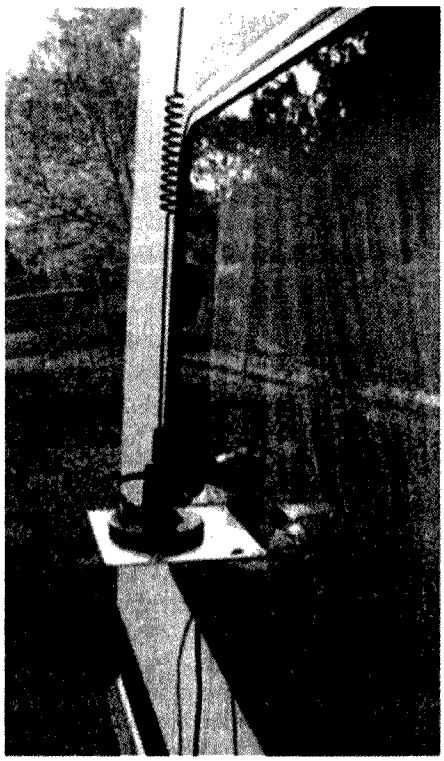


Figure 4 – Suction fitting and Mag mount on bus window

ERRATA

Amendments to Q meter article

(AR Jan/Feb 05)

Page 6: circuit diagram
IC1 is a TL081- see component overlay

Page 9: column 1
Circuit voltages (no oscillation) "Q5 base and emitter 0V" should read "Q5 emitter 0V"

Page 10: Component Overlay
Central group of capacitors should be labelled 470pF, not 4n7

Jim VK5JST

Circuit board manufacture

In AR July 03 VK2COX sought a simple computer program for the design of printed circuit boards. There is none better than Easytrax (which includes Easyplot for printing/plotting the finished design). Easytrax is obsolete in the commercial world but is still excellent for amateur use; it has the added attraction of being freely available at zero cost.

Like VK2COX I have tried other programs; I have Eagle and Vectron and, whilst I'm sure they are excellent tools, they are complex and not intuitive. Easytrax wins on both counts; it runs in DOS (no mouse) and it uses keystrokes, which are highly intuitive. For example, to Place a Track you hit PT, to Delete a Pad you hit DP and so on.

The best source for Easytrax is at RCS Radio in Sydney (*www.cia.com.au/rcsradio*). As well as free download of the program plus enhancements (or a floppy disc at nominal charge) you will find Bob Barnes a wonderful source of information and advice (and a delightful man).

This advice may, however, only partly solve VK2COX's problem. The usual photographic techniques for board production are not well suited to occasional one-off production. These techniques require darkroom facilities and the use of chemicals, which have a short storage life; this can be accommodated by those amateurs who are also keen photographers but most of us find converting the laundry to a darkroom a fearful pain.

I produce good-quality boards by plotting from Easytrax/Easyplot directly to the copper stock then etching as usual. This procedure is used to produce normal through-hole boards, surface-mount boards and microstrip boards.

Once laid-out in Easytrax (often very time-consuming and always an intellectual challenge) a board takes about half-an-hour to plot and etch. A mistake or a design change? Edit the design (saved in Easytrax) and plot/etch again; doesn't take very long.

Small plotters are now obsolete, replaced by laser printers. I paid $50 for my first plotter, a HP7550, but was later given two HP7475's (one virtually unused, in original packing with all manuals) for nothing; these are smaller than the 7550 and do the same job; their advantage is that they require less bench space.

Easytrax contains drivers for other brands of plotter, such as Roland, and these should be just as easy to acquire and get going.

I am a recognised computer-illiterate, yet I managed to get my system going; anyone can do it!

73, Kerry Power VK2TIL

Homebrew suggestion

A thought. Since my interest in homebrewing is more in the design and in getting the item working than in constructing it or in actually possessing it later, here is a suggestion for readers of "Amateur Radio" magazine. Think of something that you'd like to build, and write to me. If it seems the sort of thing that seems within my powers to design, I will send you a design including a printed circuit board pattern, and hopefully a drawing for the location of the holes in the cabinet, so that it's all easy to put together. Well, I daresay nothing ever works first time, so if you can't get it to go, post it to me; I will poke around with my fancy oscilloscope and get it going and then mail it back to you. Then there might be an article in "Amateur Radio" magazine out of it all (that depends on the Editor, of course) and naturally you will be acknowledged in print.

Any takers? Write to me at GPO Box 789, Melbourne, 3001.

Joe Rotenberg VK3BBN

PS: Only for private individuals for their own use of course. Not for commercial organisations for profit.

Editor's Note: *Publication of this offer is not an endorsement of the offer*

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

Recruiting to AR: making it interesting

I first wrote to AR magazine in October 2002, Over To You, "Why Amateur Radio is dying".

Since then I have (recently) sat my NAOCP and AOCP exams (4/12/04) with NERG and joined the NERG as well. (Awaiting results still)

After reading the 'Linton-Harrison' report (and reading the WIA sites and AR magazine for past two years) I realised that if we don't take action to encourage AR then it could be lost to commercial interests. And as a (hopefully) new operator, I too should, and would like to, contribute more than just 'operating my equipment' to a community to which I will soon belong and what I see as a fascinating hobby.

In my two and a half years of 'reading the mail' on the amateur bands I have noticed that most conversations are between older guys with very different ideas, issues and opinions and families from today's "MTV" generation, as we are called, and many young people are 'put off' by this. Many of today's young people do have the time for AR, and the money as they (including myself) still live at home, are single, but working, meaning that other than work I have little commitments and plenty of spare time to pursue my interests, as it seems rare for guys (and girls) to be getting married and settling down until they are in their mid 30's, when they then become cash & time poor.

While I don't agree with some comments I've received from my cb'ing friends, many young people who I've "tested" listening in say 'it's boring listening to a couple of old blokes talk about nothing" (Personally I find listening to the older guys has helped me learn a heck of a lot about AR, how to use it properly and just how one can do so much with AR). Unfortunately, the young guys of today see this as boring and I know of several CB operators (whom I mentioned in my 2002 article) who agree.

Since 2002, I have been visiting all my old CB friends, encouraging them to get back on air. Once one old mate came back on air, so did another, then another and HF CB ch 18 AM in Greensborough is back to the way it was back in the late 80s and early 90s, with everyone from my high school CB days back on the air once again with many of us venturing into UHF CB now as well. Many of these guys are now considering getting an amateur licence next year when the new foundation licence conditions are released.

This also proves to me that activity breeds activity and I believe if we can get more young operators on air, they will in turn encourage other youngsters to get on the air. Otherwise, when I am old, who will be left for me to talk to on the bands, in say 2050?

After a post to the aus.radio.amateur newsgroups I was pointed to a NZ site where a group of young hams had formed a 'young operators' net which was working quite well from all accounts to date. (http://yanz.nzart.org.nz/) And in ZL land the NZART is fully supporting this young operator's group, even using their (NZART's) hosting space for their site! http://www.nzart.org.nz and scroll to bottom of page, far right logo/link.

I, along with some other young operators have decided to start a VK Young Amateur Operators net/group for any amateur aged 10 (or less) to about 30 years old at http://www.geocities.com/vk_ya/ and a mailing list for this group at http://groups.yahoo.com/group/vk_ya. We hope to be holding our first on air net in early 2005, using both HF and IRLP modes/bands. (For HF we think the 160m band in AM mode would be best to allow new, potential amateurs to tune in with modified standard AM radios).

It would be greatly appreciated if you could publicise this idea and the links in next year's AR magazine and somewhere in the links section of the WIA website. Any publicity, I believe would help encourage new amateurs to join the ranks next year, and with the new licence conditions and exam methods etc due next year, what better time to start a group for young VK amateurs and potential young amateurs? It appears to have been a great success in New Zealand.

I will be joining WIA as soon as I have exam results/callsign. Also willing to be guided as to what I should put on our website etc etc so I don't step on anyone's toes etc etc.

I also provide a re-transmission of the WIA news at 11am & 8pm every Sunday on UHF CB Ch 18, as many of my CB friends who are considering being hams like to listen to the weekly bulletins but don't have scanners etc that can listen to the WIA broadcast on amateur bands. (There's no problem with doing that is there with you guys at WIA?-ACA said it was OK.) You can let potential amateurs who are yet to have any amateur gear or wide range rx'ers know that in Melbourne the WIA news can be heard on Ch 18 UHF every Sunday at the WIA's normal broadcast times. (Would prefer a repeater channel but no repeater owner would agree to it)

And if you're looking for a contributor for AR or anything else that I can do to help AR down under, again I'm willing to help, please let me know. I'm qualified in business management and have some past journalism experience (Leader newspapers, DV News, Whittlesea Post, Preston Post Times & Heidelberg) and currently work as a self-employed bricklayer/paver/building labourer, if these skills are of any use to the AR community.

PS. I said in 2002 that it would only be a matter of time before DSE stopped selling Yaesu gear and look what happened there!

Ashley Gealan
ageelan@bigpond.com
VK3??? (I hope)

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

Times of change for the Wireless Institute of Australia

James Mclachlan

As we moved to a National WIA, the hard work and many meetings have at times been very difficult for the team. There have been comments as to where we came from and why we formed, the document below is from the SA and NT Division archives. It will take us back to a similar time when the Australian WIA was in its formative years. The objects to foster our hobby certainly give us a real sense of history.

WIRELESS INSTITUTE

May 1919

Wireless Institutes are now being formed in all the states, and when they are completed it is expected that they will be linked into one Commonwealth organisation, in order to work for the common benefit of all experimenters and private users of wireless apparatus.

State Reports

NEW SOUTH WALES

Owing to the epidemic of influenza the general meeting called for April 4th has been postponed. The meeting will be held as early as circumstances permit. Intending members are invited to communicate with the acting Secretary, Mr Malcolm Perry, Box 2 King Street Post office, Sydney.

SOUTH AUSTRALIA

All interested in the formation of an institute in South Australia are invited to communicate as early as possible with Mr C Ames, 59 Cariton Parade, Torrensville, SA

TASMANIA

All interested in the formation of an institute in Tasmania are invited to communicate with Mr V McDonald Brame, 71 Hill Street, West Hobart

VICTORIA

An inaugural meeting of the Wireless Institute of Victorian was held in Melbourne on April 1st at the Marconi School of wireless, 422 Little Collins Street.

The meeting had been convened by Mr. W. King-Witt at the request of the Hon Secretary of the Wireless Institute of New South Wales (Mr. Malcolm Perry) also at the request of many radio workers returned from active service, and of others desirous of recommencing experimental work.

The chairman, Mr. E.T. Fisk, managing director of Amalgamated Wireless (Australia) Ltd., read extracts from his address at a similar meeting recently held in Sydney; he also read correspondence which had been passed between the Wireless Institute of New South Wales and the acting Minster for Navy.

A provisional committee, consisting of Messrs. Conry, Nightingal, Tatham and King-Witt, was appointed for the purpose of framing, for the new Institute, a set of rules and regulations, to be later considered at a public meeting of wireless amateurs.

QUEENSLAND

The first meeting of the Queensland Wireless Institute, convened by the honory secretary and treasurer, Mr. S. V. Colville, was held on February 26, at the rooms of the Brisbane Chamber of Manufactures.

The objects of the Institute, for submission to the inaugural meeting, were read by the chairman, Mr. H. Cornwell, these being as follows:-

(1) The name of the institute shall be "The Queensland Wireless Institute."

(2) The objects for establishing the institute are:

(a) to bring into contact all persons interested in the study of electricity, especially as applied to wireless research, telegraphy and telephony:

(b) To arrange a meeting place to facilitate study, reading , discussion questions arising from experiments, and the exchange of ideas generally:

(c) To distribute written matter on the proceedings of all demonstrative. Instructional and theoretical lectures given for the practical benefit of country members:

(d) To form a library of books works and periodicals on wireless, both experimental and commercially, and to encourage the study thereof.

(e) To endeavour to increase the individual knowledge of members by every possible means in the various fields of operation.

An inaugural meeting of the above Institute was held on March 1, in the rooms of the Brisbane Chamber of Commerce.

The office of patron was accepted by Professor Hawker, BA. BE., A.M.I.CE., principal of the Queensland University, and of president by Mr. R. A. Wearne, BA. The following were elected vice presidents of the institute:-Mr. S. H. Smith, Mechanical branch, GPO., Brisbane; Mr. H. Cornwell, manager of the Edison Swan Electric Co., Ltd.; Mr. A. G. Jackson, A.I.R.E.; of the Synchronome Electric Co., and R. A. Blackboro, RAN.

Messrs. E. M. Jack, W. J. Monkhouse, D. J. Garland, H. Priest and J. C. Price, were elected as members of council.

The proposed rules of the Institute were read and adopted en bloc, the proceedings terminated at 9.30 pm with a vote of thanks to the chairman.

May 1919.

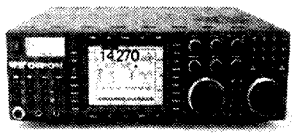
ar

TTS Systems Communications Equipment

TTS Systems www.ttssystems.com.au FREE CATALOGUE

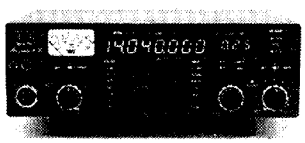
Coming soon: APRS softv

TEN-TEC ORION



- Dual 32-bit floating point ADI SHARC DSP processors • Full dual receive capability
- Very high RX intercept points
- 590 receive IF-DSP bandwidth filters independently selectable on each of the main and sub receivers • Adjustable receiver filter shape factors • Programmable AGC response time for main receiver • True diversity reception using both receivers • Continuous real time spectrum display allows monitoring of band activity
- "Instant Two Radio Mode" allows ORION to instantly QSY between two different bands • Virtually indestructable 100-watt PA • Superb SSB audio is yours at a touch of the AUDIO button

TEN-TEC ARGONAUT V

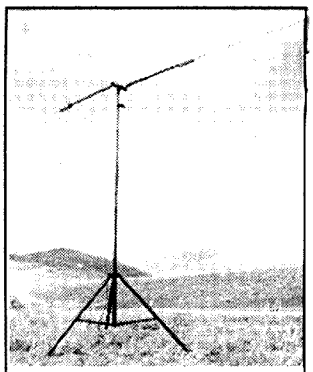


Frequency range: TX: 10-160m + WARC
RX: 0.5-30 MHz
Mode: AM/FM/SSB/CW/AFSK
RF Power output: 1-20 W
Sensitivity: SSB/CW: 0.2-0.35 uV (10 dB SINAD @ 2.4 KHz bandwidth)
AM: 0.5-0.9 uV (10 dB SINAD @ 6 KHz bandwidth)
FM: 0.35-0.6 uV (12 dB SINAD @ 15 KHz bandwidth)
Selectivity: 35 built-in filters SSB/CW: 200-3000 Hz AM: 400-6000 Hz FM: 15 KHz
Image rejection: 80 dB **Voltage:** 13.8 VDC

Current drain: RX: 950-? mA
TX: Max 6 A
Impedance: 50 ohms, SO-239
Dimensions (W*H*D): 216*70*246 mm
Weight: 2.2 Kg
100 memories. Scanning. CTCSS encoder. PSK31-ready. IF-DSP. "Software defined" radio.

Download new functions from your computer.

LDG ELECTRONICS Z100 TUNER

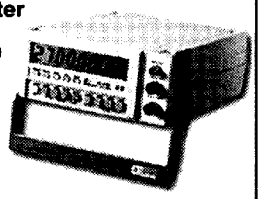


Buddipole
A Complete Portable Antenna System

- The Buddipole Antenna (9 bands, 2 - 40 meters)
- Tripod - extendable legs and locking base
- Portable Mast – extends to 8' in height
- Rotating Arm Kit – change configurations
- Antenna System Bag – padded cordura nylon w/ shoulder strap
- Extra Stainless Steel Telescopic Whip
- 3 extra Coil Clips
- Antenna Operating Manual
- FREE – New 10-page modeling report

Lutron Test & Measurement Instrumentation

Model FC-2700 – 2.7GHz Frequency Counter
FEATURES



- TCXO (Temp Compensated Crystal Oscillator) Time Base for High Stability & Accuracy
- High Sensitivity for VHF & UHF Frequencies
- Wide Measurement Range to 2.7Hz.
- 8 Digit 18.3mm LCD Display
- Data Hold & Data Record Functions
- 0.1Hz min Resolution on 10MHz Range
- RS232C Serial Output

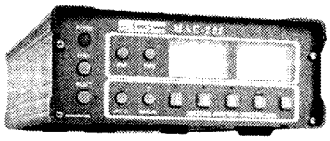
Model ET-3000 – Digital Earth Resistance Tester

The newest instrument in the broad range of Lutron field and hand held instrumentation. Housed in an attractive ABS Plastic case it features both Earth Resistance ranges of 19.99Ω, 199.9Ω & 1.999KΩ and an Earth Voltage range of 0-199.9V. A complete range of testing accessories & a carry case are included as standard.

- Earth Resistance & Earth Voltage Measurement
- Large 18mm LCD Display
- Compact Size & Easy Operation
- Rugged ABS Plastic Housing

Detailed data sheets available on all Lutron instruments

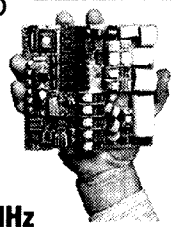
MAC-200
MASTER ANTENNA CONTROLLER (Smartuner Built-In)



Controls
5 ANTENNAS
3 S0239 COAXIAL CONNECTORS
1 BALANCED ANTENNA OUTPUT
1 END FED LONG WIRE

"The box that brought my amateur radio hobby back to life"

SG-237 HF-VHF SMARTUNER®

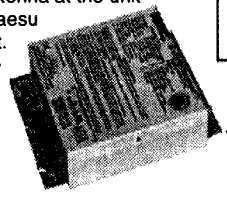


Worlds Smallest High Performance Antenna Coupler Finished Product or PCB

- **100 watts**
- **1.8 to 60 MHz**

The SG-239 Smartuner™ antenna coupler

With any transceiver get long distance communications. Great results with a longwire antenna or a coaxial fed multi resonant antenna at the unit window, fits many low cost HF transceivers: Scout, Yaesu FT-817, Kenwood TS-50, Icom IC-706, and the K2 kit. **Ideal with the legendary SG-2020 transmitter.** Silent receiver tuning or within 1.5 to 200 watts with a high power transceiver. 170 memory bins, independent sensors, inc.VSWR, phase, magnitude, low impedance, and forward sensing.



NEW

We have Low Cost instruments for measuring–

- AC/DC Voltage and Current
- AC/DC Power
- Resistance and Insulation
- Light and UV Radiation
- Pressure and Vacuum
- Force and Weight
- Dissolved Oxygen and pH
- Temperature and Humidity
- Conductivity and Moisture
- Sound Level
- Rotating Shaft Speed
- Frequency
- Radioactivity
- Air Flow and Wind Speed
- Vibration

***from* LDG Electronics**
TW–1 Talking Watt-meter
coming soon

News from...

VK2

Compiled by Tim Mills VK2ZTM.

The NSW Division has adopted the trading name of *Amateur Radio, New South Wales [BN98112045]* to carry out the day to day operations. This came into effect at the 21st January Council meeting.

The Annual General Meeting of the NSW Division of the WIA, for the year 2004, will be held at Amateur Radio House, 109 Wigram Street, Parramatta at 11 am, on Saturday 16th April. The close of nominations and agenda items occurred a few days ago on the 5th. In a process approved at the 2004 AGM, members may have electronic delivery of the Annual Report and Financial Statements. Any member with access to e-mail facilities is invited to send an e-mail to the Parramatta office - vk2wi@wiansw.org.au - specifically requesting electronic delivery. To meet production deadlines please advise by 5th March. This action will assist with savings in printing and postal costs. Anyone not taking up this offer will receive the relevant material by mail. To keep informed on aspects of the forthcoming AGM members should listen to the VK2WI Sunday news session. To take part in the AGM, former members of the NSW Division must be financial members of *Amateur Radio, New South Wales.* If you were a member of the NSW Division and your renewal fell due between 1st July 2004 and 16th April 2005 you will need to have renewed your membership with *Amateur Radio, New South Wales.* If your renewal falls due from 17th April 2005 to 30th June 2005, you will be deemed to be a member of AR NSW for the purpose of the AGM. Naturally we invite you to renew membership with AR NSW as well the National WIA.

The next exam being conducted at Parramatta will be on Sunday 3rd April. The closing date for applications is 22nd March. Apply to the office or check out the web site for an application form.

Chris VK2QV has taken over as Webmaster for the AR NSW site. There has been some change and updating of the material. Check it out at http://www.wiansw.org.au. Chris advises that there may be changes to some of our email addresses. For the moment email can go via vk2wi@ozemail.com.au as well as the other address vk2wi@wiansw.org.au Your feedback is most welcome. One of the sites is the Bookshop. Check out the latest stock. Contact with the Parramatta office, other than by email, is telephone 02 9689 2417. Fax 02 9633 1525. Mail to PO. Box 9432, Harris Park NSW 2150 or personal visit on Tuesday, Thursday and Friday, 11 am to 2 pm.

As advised in the February notes, work has been carried out at the VK2WI Dural site. The 30 metre tower was stripped of most existing antennas and their co-ax cables. A new set of antennas and co-ax went up in their place. There is still an antenna at the top to be changed and a couple to be added to restore the full system. At the same time several trees, which had encroached into the HF antenna space, were adjusted. Also adjusted were some which were close to buildings and structures. To provide a balance in the vegetation department, several trees have been added to the property perimeter.

This month will be the next Trash and Treasure and Home Brew activities at Parramatta. The date will be advised on the VK2WI news, as the normal date is Easter Sunday. Also over Easter will be the Urunga Convention, an annual event since 1948.

A request to clubs and groups. The listing of your repeaters may need updating. For example, do you still have a packet system? If not, this may still be shown on the WIA data base. Email details to Parramatta.

The second quarter roster for VK2WI will be compiled soon. Please contact John VK2JJV for those dates you desire. If you would like to join the roster we would be pleased to hear from you. In this quarter we welcome a new voice, that of Darren Geyer, who has come to help us out.

73 - Tim VK2ZTM.

VK4 – Qnews

From Alistair Elrick VK4MV

Dates to mark in the Diary

May 7 BARCFEST. The location will be Mount Gravatt Bowls Club 1873 Logan Road Upper Mount Gravatt.

April 30 / May 1 Claireview Amateur Radio Weekend

Internet Linking of Repeaters

The CBRS is pleased to announce a trial of EchoLink in connection with its 70cm repeater VK4RBR situated atop the Moreton College of TAFE, Mt Gravatt. The repeater has useful coverage of Brisbane and surrounds and operates on 438.275 MHz with a 91.5 tone. The link radio is equipped with a tone encoder and so remote connections will not need to provide the tone. The link, VK4PKT-R (EchoLink node number 227492) is operational all hours and with 3 hams on the premises will be monitored closely for evaluation. As with linking protocols, allow a gap of AT LEAST 2.5 seconds after any transmission. This is VERY important so please go slow on the key. All and any feedback should be directed by packet to the SysOp Ari, vk4jew@vk4wie.#bne.qld.aus.oc or in case of emergency by phone on 04 1053 3707. (VK4JEW / VK4PKT)

Targeting Seniors for AR

The Bayside District Amateur Radio Society Inc were invited to participate in the U3A (University of the Third Age) sign-on day which took place on Friday the 21st of January at the Redlands Community Centre. On Friday morning, U3A personnel had setup "Sign-On" tables for each of the courses available to Seniors. QNews is not aware of Ham Radio Courses being

available, but Bayside members on site managed a contact with Robert VA3RCM in Ontario Canada via IRLP and several HF contacts were made with ZL stations. Bayside member Ken Fuller elicited names and phone numbers from at least 20 interested passers-by. The general opinion was that Bayside successfully showcased Amateur Radio to the Redlands public. Bayside Club are holding their Annual General Meeting on Monday 7th March President Paddy will be stepping down this year, so hopefully all will get along that March 7th to help out.

RADAR/Rocky Club

If you find the Rockhampton 2m Repeater 146.700 MHz a little "deaf", (seems to happen in wet weather), swap to their 70cm repeater on 438.225. Clive, VK4ACC believes investigation will take place ASAP.

From the QAC with NEWS

As we heard in the recent National News, Ewan McLeod, VK4ERM, has been appointed WIA Vice President, and as he is presently a Director of the WIA, Ewan has indicated to the Board that he will resign from the Queensland Advisory Committee.

Lighthouse Weekend – any takers?

Interested in activating Cape Cleveland Light for the Lighthouse Weekend in August? At a great DX location on HF and VHF plus some terrific ambience to make operating a pleasure! Got you interested? Contact Steve VK4JUS to put your name down on the expeditioners list! Don't wait until the last minute though, forward planning is taking place NOW!

From the TARC

Date claimer for North Queensland Amateur Radio Convention 2005 That premier event on the worldwide Amateur Radio calendar is taking place again in 2005. The North Queensland Amateur Radio Convention will be happening at the Douglas Campus of James Cook University plus other event centres from Friday September 16th to Sunday September 18th. Mark the date down now - event particulars and registration info will be released in March.

New night for the Microwave Net

The TARC Microwave Net is moving to a new day but at the same time from 9 pm Mondays on the VK4RAT 70 cm and 23 cm repeaters. It's your chance to work millimetrically with like-minded experimenters, discuss the latest discovery or problem and generally fine tune your apparatus on-air. So that's theTARCinc Microwave Net, starting February 14th 2005 at 9pm - Be There! (Gavin VK4ZZ with info supplied by Don VK4MC)

RAT goes FLAT

The VK4RAT VHF and UHF Voice Repeaters were off-air from about 2 pm Jan 25th until 2 pm Jan 26th due to a battery charger failure. The repeaters are back on-air thanks to switch over to a standby charger. The cause of the fault in the main charger is interesting - by now you would expect equipment manufacturers to take heed of field service reports and stop using the contact cement that, upon ageing turns conductive and absorbs moisture! That's right, they are still using that goop to over-stabilise large electrolytic capacitors in the event the devices are used in fast decelerating vehicles !

The charger in question had only been in service for 3 years.

When will they ever learn? Something to take note of for everyone interested in maintenance or construction, use appropriate sealants and adhesives on your work.

VK6

Will McGhie VK6UU
will2@iinet.net.au
08 9291 7165

Change of responsibility

With the winding up of the VK6 WIA, work continues to sort out the fine detail. A number of responsibilities are in the process of discussion with VK6's main club WARG, (West Australian Repeater Group). WARG was formed in the 1970s and has been one of the most successful and largest supported clubs. WARG appears to have the capacity to take over some of the roles formally administered by the VK6 WIA. Offers have been made by WARG to take on the Sunday morning broadcast, the international HF beacon VK6RBP, responsibility for the provision of Amateur Radio courses and the VHF Morse Beacon.

The winding up VK6 WIA council continues to meet each 1st Tuesday of the month. At February's meeting outstanding payments were made of about $800 leaving $2,000. Hopefully the retained funds will see the council through this transition phase.

It was reported at this meeting that the 3 major clubs in the Perth area have about the following membership.

West Australian Repeater Group 150,
Northern Corridor Radio Group 40,
VHF Group 43.

Minutes from way back

Last month's VK6 notes were in part about the early beginnings of Radio clubs in VK6 and how the VK6 WIA came into existence in 1919, as told in the original minutes. Following on from this in brief, the years from 1919 to 1921.

The next meeting of the newly named club (Wireless Institute of Australia VK6 Division) was on 20th November 1919 and is the first typed minutes in the minute book. Correspondence from the N.S.W. Wireless Institute of Australia was read and the Secretary

was instructed to "communicate with the N.S.W. section for the latest copy of their rules." It appears that The Wireless Institute was not an organization, as we know it. The various state based clubs were just that, stand alone but moving towards a common name and formulating a set of rules that best served the new hobby. One other point of interest from the minutes of this meeting was "to communicate with the Naval Authorities Fremantle asking for their attitude in regard to the recognition of the local institute in matter of issuing licences." As there has been no mention of any form of licensing so far in the minutes I gather licences were yet to come. Also contained within these minutes was the appointment of a technical advisor (Mr Gray) to report on the direction of the use of valves.

At the next meeting on the 18th of December 1919 a letter was received from the Naval Department re licences and after a discussion it was decided to submit 3 or 4 applications for permits.

At the first meeting for 1920 on 11th February at the science lecture room Perth Boys School, "Mr McKail reported he interviewed the caretaker and concluded that the cost of electric lighting per meeting would be 6d and the cost of extra cleaning 2/6 per meeting."

At the meeting on 28th February 1920 it was moved and passed "that forms for application for licence be procured and that members apply for same through the Institute." The following meeting on 4th March 1920 it was moved "that applications for licence be forwarded to the Naval department." The Naval department replied "issue of temporary licences" and the letter was read and explained at the next meeting on 25th March 1920.

Meetings throughout 1920 were every month with a letter from the Sydney Division with a list of calls read to the meeting. Also a badge and emblem on flag design was sort. Lectures continued throughout the year with topics being electrical units, induction and capacity, and telephone receivers as examples.

The first meeting for 1921 made the first mention of Central Executive. The motion reads, "That Central Executive be advised re transmitting licences, and to ask them what steps have been taken to procure same." Also at the same meeting a motion was passed "That each visitor be allowed to attend only one meeting per annum."

The April meeting is worth reproducing in part.

"Minutes of General meeting of the Wireless Institute held at Stott's College on 27/4/21 at 8 pm. Mr Coxon presided.

There was a very small attendance of members & several visitors were present, including Mr Rossiter from the Observatory.

A letter from Lieut P. Polinane a Russian W/T Engineer at Constantinople was received applying for a position in the Institute. The secretary was instructed to reply stating the functions of the Wireless Institute in W.A. & that no vacancies existed in W.A. branch at the present time for a Wireless Engineer.

Mr Coxon then gave his lecture on "Valves" with a demonstration. It was very interesting from start to finish, & the W.A. Division can be proud to have such a practical member as Mr Coxon. The demonstration was particularly interesting in view of fact that the oscillations could be heard in any part of the room with a pair of phones."

For the moment the brief description of the minutes from 1919 to 1921 comes to an end for this article. The first minute book continues to 1924 and time permitting, more next month.

Radio enthusiasts formed Western Australia's first radio club and from this the beginnings of the Western Australian Wireless Institute. Perhaps some readers may be able to add to the history as I have read it from the minutes. The closest I came to knowing any of these early amateurs was Wally Coxon who was active on 2 metres FM some 30 years ago. They have passed on but the history is there in the first minute book. However history is of no use if it is not available for all to read. I have scanned in the entire minute book, all 188 pages, and plan to make them available on the Internet.

VK7

Justin Giles-Clark VK7TW
Email: vk7tw@wia.org.au
Regional Web Site: www.reast.asn.au

It's official – More VK7s are using HF!

The first of January 2004 saw the Morse requirement for amateur licensing dropped and with this, many more amateur gained access to the HF bands. An analysis of the VK7WI regional callback statistics has revealed that the licence change has certainly seen an increase in the usage of HF (80, 40 and 20 m) for at least the VK7WI broadcast!

For the last 6 months of 2003 the average HF callbacks were 18.7 and for all of 2003 it was an average of 20 callbacks.

For the first 6 months of 2004 the average HF callbacks were 36.1 and for all of 2004 it had dropped back to an average of 32 callbacks. That's double the number of HF callbacks!

The same comparison performed on 2 and 6 m VK7 repeaters and UHF and HF CB callbacks reveals these did not change to anywhere near the same extent over that period. The above analysis provides some hard evidence that the change to licensing has resulted in greater utilisation of HF for at least the broadcasts!

VK7RAF Update

VK7RAF, 146.650 MHz on Mt Faulkner is back on the air and is bigger and better than ever! The repeater has been fully replaced with commercial units thanks to Brian, VK7RR and Joe, VK7JG.

The new repeater also requires a 123 Hz subtone for local contacts and the original 141.3 Hz subtone for the link to VK7RAB on Mt Arthur. The repeater

also has a 141.3 Hz CTCSS tone on TX for people who require a subtone to eliminate mute openings around the city.

If people are using the 141.3 subtone encoders in their rig they will have to programme a second channel with 123 Hz subtone carrier for local contacts. So if you hear someone call you will have to determine from which end of the state the call is coming and change channels accordingly.

Echolink HF Node in Hobart node no. 165881

Ross, VK7VKK has established an Echolink node operating on 3.585 MHz LSB.

Echolink uses the Voice Over Internet Protocol "VOIP" and allows licensed amateurs to communicate world wide using the Internet as a communications back-bone either between computers and/or radios. For more info see www.echolink.org.

The HF Echolink station in Hobart, operates every day and presently the system logs around forty stations a day worldwide. If you are in the shack have a listen especially throughout the day and you will be amazed what calls you will hear.

SSTV internet gateway now available

Danny, VK7HDM and Ken, VK7DY have established a slow scan TV Internet gateway repeater on 146.950 MHz in Southern Tasmania.

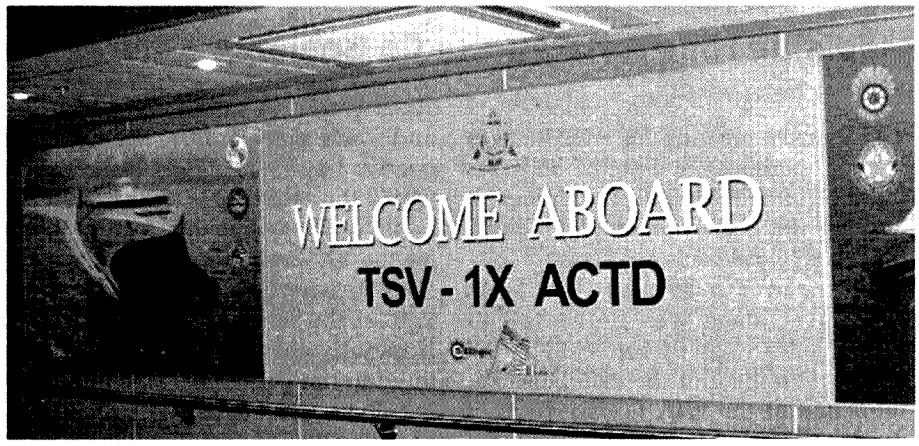
To send pictures out over the gateway you need 1750 Hz tone turned on in your SSTV program. Much like the HF SSTV repeaters. The equipment needed is a radio capable of simplex 146.950 MHz, a computer with a soundcard and a simple interface between the soundcard and the radio (see AR Magazine – March 2000) and an SSTV program and there are plenty of freeware ones, just do a search on, you guessed it, the Internet!

Northern Tasmanian Amateur Radio Club

On February 9, NTARC held its annual general meeting. It was very well attended with 25 members coming along to support the club.

The following office holders were elected for 2005 – President: Alan, VK7AN; Vice-President: Kevin, VK7KVN; Secretary: David, VK7HAH; and Treasurer: Bob, VK7KRR.

NTARC's March meeting on Wednesday the 9th will be a talk on the Optus network in its many forms, the speaker is a specialist on GSM and cellular communications. This will be held at the Alanvale TAFE College, Block B at 7:25pm.



What the paying customers see!

Radio and Electronics Association of Southern Tasmania Inc.

On Wednesday 25 January a group of about 45 people visited International Catamarans for a tour of Catamaran TSV-1X ACTD (Theatre Support Vessel First Experimental Advanced Concept Technology Demonstrator) or just "Spearhead".

This 98 metre wave piercing catamaran has seen 120,000 nautical miles in the last two years including service with Operation Iraqi Freedom. From a communications perspective, the vessel has a T1 network connection via a 2.4 m C band satellite dish that is piped around the vessel and theatre of war command room. It can carry 300 passengers, 700 tonnes of cargo and has a top speed of 42 knots!

Thanks to US Army personnel, Josh and Victor for showing us through their pride and joy.

REAST AGM

We had more than 30 members and friends attend REAST's first annual general meeting. The official positions were filled by the following members: President: Justin, VK7TW; Vice-President: Brian, VK7HSB; Secretary: Dale, VK7DG; Treasurer: Roger, VK7XRN; and, Committee member: Bob, VK7KRW.

On April 1 & 2 REAST will be displaying and promoting Amateur Radio to the VK7 community at the 8th Model Makers and Collectors Exhibition at the Derwent Entertainment Centre. See you there!

ar

REAST AGM Attendees

News from...

VK5

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

The January meeting for AHARS was a social barbecue at Seacliff and was attended by about 40 people. A pleasant evening was had by all and included a bit of a giggle at some old films.

At the end of the evening a Certificate of Appreciation was presented to Christine VK5CTY by Jim VK5NB, the retiring President of the VK5 Division, on behalf of the WIA for the years of service she has given to amateur radio in VK5.

AHARS usual meeting night is the third Thursday of the month and the venue is the Blackwood High School. The meetings start at 7.30 with the guest speaker and conclude at 10.00 with a short break for coffee at the end of the talk.

All are welcome. If you are visiting and want more information, please contact Geoff VK5TY, or Paul VK5PH QTHR the callbook.

AHARS has taken over responsibility for the VK5RAD repeater now that the VK5 Division has closed its books as part of the move to a national WIA. Hopefully this repeater will be able to continue operating from the same excellent site which covers the state so well.

The threatened doubling of the rent for the site has been reduced to 10% only through prolonged negotiations with the owner of the site, by Geoff VK5TY. As long as there are not future increases of the size threatened, the status quo will be able to be maintained.

(Right) Christine VK5CTY shows her Certificate of Appreciation

Elizabeth ARC

The EARC had an early look at Jim VK5JST's Aerial Analyser and decided it would be an excellent project for club members.

Jim gave his approval for the club to purchase PCBs and Keith VK5OQ kindly offered to source the components for assembly kits. These were advertised on the VK5 Sunday morning broadcast. They were snapped up like the proverbial "hot cakes". Some club members decided to build their kits at the clubrooms, where they could get some assistance.

So a few weeks ago they turned up at the clubrooms with toolboxes and soldering irons and assembly commenced. One member, who had already built a kit, helped with advice. The skills standards varied a lot so it will be several nights before all the kits are completed and tested.

There was a comment that all the builders will not be pleased with their HF aerial analysers once they start to use them on their aerial systems and see what they are really like.

One member has already gone through this process with the aerial he has used for the last 20 years with good results, he reports, and SWR at the shack end.

Jim's Aerial Analyser is a handheld, self-contained, battery powered unit covering 1.2 to 32 MHz. It has an LCD readout giving impedance, SWR, frequency and capacitive or inductive reactance.

The kits cost about $100 while a similar commercial unit would cost four to five times this. The club is sourcing a further 10 kits all of which are spoken for.

Steve VK5AIM EARC.

***Editor's note.** We hope to publish an article on this unit in the next few months.*

Five club members at work on their kits.

South Coast Amateur Radio Club Inc.

PO Box 333
Morphett Vale
South Australia 5162
E-mail: secretary@scarc.org.au
Website: http://www.scarc.org.au
Clubrooms: 12 Baden Terrace, O'Sullivan Beach, 5166.

South Coast Amateur Radio Club Inc. Annual General Meeting

The SCARC AGM was recently held on 24th November 2004, where the following positions had nominations and members voted in:

Chairman: Ellis Horman VK5ELS
Treasurer: Neville Pudney VK5ZHP
Secretary: Stef Daniels VK5HSX
Committee Member #1: Barry Bates VK5KBJ
Committee Member #2: Derek Evans VK5ZRE
Committee Member #3: Sam Adcock VK5KSA

Thanks to the past members who contributed to the development of the club, especially to Barry Bates VK5KBJ, who was Chairman for many years. This year he stated he definitely was not standing for the position, allowing someone else to take the reins.

The Russell Smith Memorial Award (judged annually by the members and presented to member who upholds the aims and objectives of the club) was presented to Barry Bates VK5KBJ. Congratulations Barry.

Minutes of the meeting will be placed on the club's website, with further information obtained by contacting the Secretary, Stef Daniels VK5HSX by either mobile 0417 821 747 or email: secretary@scarc.org.au . The SCARC website located at www.scarc.org.au .

Look forward to seeing you supporting the club over the next 12 months, with up and coming events like: Contests, Repeater Upgrades, fund-raising and attendance at meeting nights.

Regards,

Stef Daniels. VK5HSX
Secretary SCARC Inc.

VK4

Dalby & District Amateur Radio Club

Meets on the 1st Sunday of: February, April, June, August, October, and December at the 4DDD FM Studios, 107 Drayton Street Dalby, at 1400hrs

Postal Address: 15 Bunya Street. Dalby 4405
E-mail: ervon@bigpond.com.au
Repeaters: VHF 146.675. UHF 438.7 Co sited on the Bunya Mts.
UHF CB repeater channel 7 in Dalby
President: Ricky Lammas VK4NRL Ph 07 4662 0095
Secretary: Margaret Schwerin VK4AOE Ph 07 4662 3934
Treasurer: Neil Holmes VK4NF Ph 07 4662 4950
Repeater Co-ordinator: Mike Taylor VK4XT Ph 07 4662 2389

Please note corrections to the information printed in Nov 2004 in both AR and the WIA 2005 Callbook.

The correct and only postal address for Dalby & District Amateur Radio Club is:-Dalby & District ARC, 15 Bunya St, Dalby, QLD 4405. The PO box was cancelled in March 1999. We wonder how much correspondence has been lost because this address was not noted. The 2m and 70cm repeaters (Callsign VK4RET) are co sited on Mt Kiangrow in the Bunya Mountains. These repeaters service the Darling Downs and South Burnett areas and not just the town of Dalby.

Margaret Schwerin VK4AOE
Hon Sec D&DARC

Oxley Region Amateur Radio Club Inc.
Port Macquarie
announces

30TH ANNIVERSARY FIELD DAYS

Queen's Birthday Weekend
11th & 12th June 2005

Full details in club news and broadcasts later

First Class CW Operators' Club (FOC)

David Pilley VK2AYD

From time to time those of you that use telegraphy (CW) have no doubt heard stations signing with '161'. A combination of 73 (kind regards) and 88 (love and kisses). Those stations are generally members of The First Class CW Operators' Club (FOC).

The FOC is not new. It was 66 years ago that Bob Webster, G5BW, first put the idea of the Club to the RSGB. At that time the ARRL had their 'A1 Operators Club' and Bob wanted something similar in Great Britain.

Today there are 500 members around the world scattered in some 40 different countries. The majority are still in Great Britain and the U.S.A. Here in Australia we have only nine active members and need more.

The objective of the Club is to encourage a high standard of operating behavior on the bands. No, they do not consider themselves elite in any way. However they do try to live by the rules of a high standard of operating. Members are expected to observe their Code of Conduct – To foster and encourage a high standard of operating and behaviour on the bands – To observe the licence conditions and principles of band planning – To be considerate to other amateurs at all times – Promote exemplary operating standards – and to promote the future of the hobby.

FOC is not for everybody! But if you have a genuine love of CW and enjoy socialising with others of like interests, then FOC could be just right for you. The route to membership is quite lengthy but it is open to anyone who has the necessary skills and the right attitude. FOC is not a closed society; anyone who really wants to be a member can get there.

To become a member, you must be sponsored by five existing members, from at least two continents, who have been in contact with you using CW during the past 12 months. At least one sponsor must reside in Great Britain. It is expected that a potential member will have demonstrated his good operating practice, over the air, during an extended period.

During the sponsoring period, other members of the club may have the opportunity to object to the nomination of a specific station. Grounds for objection may include evidence of bad or ill-mannered operating, poor CW ability or even evidence that nominations have been openly solicited. Objections are thankfully very rare and are carefully considered by the Club's Committee, which will only uphold the objection if there are ample grounds.

The required sponsorship must be obtained within a period of six months. If you get your five sponsors in that time then you progress to the "starred list" for a period of three months during which the objections process described above still applies. At the end of the starred list period you will be eligible for membership and if there is room then you will receive an offer immediately.

Once having attained membership you are expected to continue reasonable levels of activity and continued observance of good operating practices is still required.

Each February the FOC hold their annual Marathon. This is a 48 hour weekend that provides an opportunity for old members to talk to old friends and to meet the new members. It does have a competitive edge for those interested in contesting.

Each year dinners are held around the world where members can come together in personal fellowship. The most popular is in the UK and held in October. For many years this was held at Lords Cricket Ground. USA members also sponsor dinners on both coasts.

Various awards, such as Worked All States – FOC members, are popular for those interested in a challenge and trophies are offered for operating achievements.

Generally FOC members operate around +.025 kHz on most HF bands except on the WRC bands where they can be found around 18.080 MHz and 24.905 MHz. If you hear one, why not give him, or her, a call and say hello and help foster the fellowship of Amateur Radio.

Telegraphy may no longer be part of the licensing curriculum, but it is a mode that can be enjoyed with people who want to foster and maintain a language that is personal. If you are interested in the FOC why not visit their web site at http://www.firstclasscw.org.uk.

See you on +.025 kHz

de David VK2AYD

(VK members VK2AYD, VK2BPN, VK2BJ, VK3XU, VK4EMM, VK6LW, VK6VZ, VK6WT and VK8AV.)

ar

Silent key

Bill Beyer VK3BHW

Members of the East Gippsland Amateur Radio Club regret the passing of our valued friend Bill Beyer.

Bill was born in Amsterdam in 1938 and after serving in the Merchant Navy trained as an Instrument Technician in Holland.He came to Australia at the age of 35 and worked in the automation industry before retiring to his retreat at Seaspray Road, Longford in East Gippsland.

Bill held a pilot's licence as did other members of his family. He was an inventive person and put together many novel innovations around the home, he also enjoyed building much of his Amateur radio equipment.

Bill passed away at Longford on Friday 11th February 2005.

Bob Neal VK3ZAN.
Secretary EGARC.

Spotlight on SWLing

Robin Harwood VK7RH

Disappearings

I have just received news that Deutsche Welle is going to drastically reduce their German language output, particularly to Oceania and Asia. DW will be only on two channels from 0600 till 0800 from Germany on 9735 and from Antigua but it is unclear what channel. As well relays from Russia and the CIS, which have been heard here in our local evenings, will also cease. Fortunately I do hear DW around 2000 broadcasting to Europe and Africa on 9735 or on 6075.I expect increased use is going to be made of their relay facilities at Trincomallee, Sri Lanka and at Kigali in Rwanda

As I have previously mentioned, Radio Vlanderen International is also ceasing external broadcasting on the 27th of March because of budgetary constraints. A relay of their domestic networks will be beamed to Central Europe. I expect that the Wavre transmitters within Belgium could be used but perhaps it is economically viable to rent senders from Deutsche Telekom or VT Merlin. These two European companies seem to have taken over as the primary senders for international broadcasters. VT Merlin seems to also arrange for senders in other countries whilst the Germans are restricted to using spare capacity over their senders.

There was a rumour that the Italians had left shortwave but fortunately it turned out to be propagation rather than a political decision.

HF blackout comes at the wrong time

In January, we had probably one of the most prolonged HF blackouts for some decades. A series of solar storms severely disrupted communications for up to a fortnight especially at the height of the dramatic rescue efforts for the Indian Ocean tsunami.

Solar Cycle

The predicted minimum for the current Solar Cycle could be later this year or early in 2006. The 13 metre broadcasting allocation is not as lively as it was 18 months back and the 11 metre allocation has now been completely abandoned by the French. The only broadcasters utilising this are low-powered remote audio OB links in America or experimental DRM transmissions.

Appearings or disappearings?

Ukraine now has a new elected president and a pro-western government installed in Kiev and I would not be surprised if the existing shortwave broadcasting facilities will increase their output, particularly to Europe and North America yet I expect that they will be beaming mostly to the former Soviet Union. Ukraine is politically divided with the western half pro-European and the eastern half leaning towards Russia.

Senders are located at both ends of the republic and are utilised by Russia and other CIS nations. I do expect also that domestic relays of international broadcasters will have been reinstated by now, which may mean that external broadcasts in Ukrainian via shortwave may be cut back.

A-05 broadcasting period begins

Don't forget that Easter Sunday, March 27th, is the commencement date for the A-05 broadcasting period, coinciding with the introduction of Summer time in the Northern Hemisphere. NSW, Victoria, Tasmania plus SA revert to Standard time on the same date. Expect major changes to frequencies and operational times on that date.

Well that is all for this month and your comments are always welcome at vk7rh@wia.org.au. 73 de VK7RH.

ar

Over to you

"Shack in a Briefcase"

In the December 2004 issue there was an ad for the sale of a communications receiver from an SWL moving into an aged person's home where no antennas were allowed. This situation is fairly common with older Hams. I would want to remind those with this problem that they do not have to give up their hobby.

For example, I have recently been conducting further tests on my "Shack in a Brief Case" antenna. (See AR July 2002) This little antenna used indoors enables a wide range of contacts. A few days ago I was working VK3LY at Nhill, halfway to Melbourne, on 40 metres. As usual I was using my "invisible" wire lying on the tiles, an end-fed half wave on 40. When I switched to the mini antenna he could not notice any difference.

An indoor antenna might be expected to be a TVI problem, but with this tuned it is not so. On a small TV set some fifteen years old with its indoor antenna sitting 40 cm away from the transmitting antenna, and using 100 W. PEP from the transmitter, only the ABC showed any interference. The other channels showed none. On our main TV, in the next room, also with an indoor antenna, no interference was evident on any channel, even when feeding the TV through a cheap VCR tuner.

For those only interested in receiving, I have been using a small tuned antenna with a Yaesu VR-500 handheld broadband receiver with great success. Hopefully this will be published in AR at a later date.

Ron Holmes VK5VH

ALARA

Christina Taylor VK5CTY

It is just over six months until the ALARAMEET in Mildura

It is time to make your travelling arrangements so you will be there for all the fun. There are several caravan parks and motels in Mildura and lots to do and see.

The MEET will run from 9th to 12th September 2005. There will be an Unofficial Dinner on the Friday evening. This has become a tradition for those who are eager for the event to start. Official registration will be on the Saturday morning with an excursion in the afternoon. The formal Dinner will be that night and another excursion is arranged for the Sunday morning. In the afternoon we will have some presentations etc, then the venue for the 2008 ALARAMEET will be announced and the ALARA Banner will be handed on to the next coordinator.

For those staying on, another informal meal is planned for Sunday evening, followed by a trip to the Mungo national Park on Monday.

If previous ALARAMEETS are any indication, people will be arriving from the middle of the week before, and the last participants will probably not leave till the middle of the week afterwards. Some people are gluttons for punishment!

If you have never been to an ALARAMEET this will be a good one to attend. ALARA will be celebrating 30 years of existence, and will be returning to the site of the first Meet in 1984, 21 years ago.

Please do come to the MEET or contact us if you were an early member.

It is always a shame to lose contact with people even if they have taken up other interests. We really would like to know how you are and what you are doing now, even if you cannot join us.

Marilyn VK3DMS is QTRH the callbook or can be contacted through the ALARAMEET webpage the address is http://users.ncable.com.au/gsyme/AlaraMeet/ or through a link from the ALARA page http://www.alara.org.au

I can be contacted QTHR the call book or by email geencee@picknowl.com.au

Why not try 20 metres?

Several of our members have been looking at 20 metres lately with good results. Pat VK3OZ is a CW user and was delighted to have a contact with a station in Sweden one afternoon. Among other items of interest, they exchanged the temperatures they were expecting that day. In Sweden the maximum was expected to be –15°C while Pat was expecting 33°C. How marvellous it is to have a hobby that brings two parts of our diverse world together in real time.

Pat's other contact was even more exciting. She heard a station in Tel Aviv and made her first ever contact with Israel. Now she is waiting for the QSL card to arrive. She says that 20 metres seems to be there for a while and then to disappear. After a couple of hours you will again hear DX stations then it may fade again and return quite late in the evening, so she suggests you keep an ear on the rig and perhaps call CQ at intervals, rather than continuously.

Pat was presented with the Florence McKenzie trophy at Murray Bridge. She has won this trophy, awarded for CW contacts, three times, now, hopefully someone else will join her in future ALARA Contests. We need more CW operators!

Shirley VK5JSH is a regular on the 222 Net on Monday afternoons and has made some unexpected contacts through this marvellous Net. Officially the 222 net starts at 0530 UTC but many overseas YLs call in before that because of the time differences. If you want to catch these YLs you should call in early, too.

Shirley has also recently spoken to a Norwegian YL on Echolink. To some amateurs Echolink is "not really amateur radio" but as you can only participate in this mode if you are an amateur it really is part of the amateur world.

One Monday, not so long ago, the VK YLs on 80 metres were startled to hear a G station coming in loud and clear. Yes, on 80 metres at night! The OM was using an HF Echolink channel. I suggest you listen out, you may be surprised!

When visiting another state or town

There was quite a bit of visiting during the first week in February. While my OM and I were in VK3 for a family birthday we took the opportunity to visit Marlene VK3EQO (formerly VK5QO) and her sister Valda VK3DVT, and, on another day we visited with Jean and Stewart Day who would be known to many amateurs around Australia. It is great to renew friendships made through amateur radio.

After one and a half trips across Bass Strait (they were on the "Spirit of Tasmania" when it was turned back by the storm and had to continue their journey the following day) Marilyn VK3DMS and her OM Geoff VK3ACZ spent some time with Susan VK7LUV and her OM Alan VK7JAB in Ulverstone.

Why not go visiting, too, next time you pass through a new place? Or at least, put out a call on 2 metres, there is usually someone listening who would be delighted to have a chat and welcome you. Of course, if you hear someone from interstate, do give them a call and make them feel at home.

ar

Pat receiving the Florence McKenzie Trophy at Murray Bridge

Bill Magnusson VK3JT

Shielding of satellite signals by wet trees

This is a topic that comes up from time to time in discussions on the bulletin board and on-air. Wet or dry, a large tree can be a strong attenuator of signals particularly in the UHF and microwave bands. Trees can act as an effective barrier to 2.4 GHz signals from Oscar satellites. If the foliage is wet it can completely block down link signals and render even higher power uplink signals ineffective. Various attempts have been made to quantify this problem but there are simply too many difficult variables like density and size of foliage, tree type and age, seasonal influences on sap flow or degree of wetness. Studies have been done but the results are usually inconclusive and unlikely to shed any light in your particular case. Despite this uncertainty it's accurate to say that trees spell trouble and are best avoided when siting your antenna system. The problem can't be overstated. I know of amateurs who have literally given up on amateur satellites because of trees they couldn't work around. It would be wise to seriously look up and about before deciding exactly where to put your satellite antenna mast and indeed whether your location gives you a good enough sky view to use the satellites at all. It could save you a lot of aggravation later on. As Oscar frequencies inevitably move upwards, close by trees certainly won't help your station's efficiency. On the other hand people have set up successful ground stations on the balcony of a high-rise building with very limited sky view. We don't all live in a perfect situation. In the end it's a matter of fitting in with your environment - but remember - a tree can be just as opaque as a solid building at microwave frequencies.

Do your own thing

It seems like there's always some discussion on the various forums about which type of satellite AMSAT should or should not spend time and resources on developing and launching. Sometimes this "discussion" culminates in a good-ol'-knock-down-drag-'em-out on the bulletin board. When all the dust settles and the ruffled feathers smooth down again the idea that usually endures is to simply do your own thing. Do what you enjoy. After all it's supposed to be a "fun" hobby. The various agencies that work together to provide us with a range of satellites to play with do a great job in catering for all tastes and allow for freedom of choice for satellite users. If you are a newcomer and want to simply wet your feet before plunging in for a full scale commitment of time and money, you have the easy-sats. Some of these require only a hand held transceiver and a simple hand held antenna to point in the general direction of the bird as it goes over. Even this basic arrangement can give the newcomer a definite "feel" for satellite operation. An appreciation of Doppler shift, the motion of a satellite across the sky, the signal strengths to be expected, the operating protocols - all play their part in introducing the newcomer to the complexities of satellite operations in a painless way. In lots of cases an experience like that can whet the appetite for more - exactly what it's designed to do. I have friends whose first hamsat experience was a hand-held and rubber duckie contact with MIR and who have gone on to develop full auto-track ground stations capable of working the high orbit birds on microwave. Somewhere in there is a level that has the capability of holding your interest no matter what your degree of involvement turns out to be. We will have more high orbit birds soon. The digital satellites are there if that is your inclination. In the meantime - do your own thing. The satellites are there to play with or to do some serious learning if that's your bent. At either end of that spectrum it should above all be fun!

Celestrak users should move to Space-Track as soon as possible.

The NASA/GSFC OIG web site recently announced that they will cease operation on 2005 March 31.

Tom Kelso subsequently published a bulletin confirming that CelesTrak would continue to disseminate TLEs until that date too, but will be unable to do so starting April 1. He went on to encourage anyone who had not already done so to register a Space Track account as soon as possible in preparation for this transition. This can be done at <http://www.space-track.com>. Issues regarding the user friendliness of the Space-Track data for amateur radio tracking programs are being addressed daily in discussions on the AMSAT bulletin board. Software developers are also beginning to look at the issue. For those who have a favourite tracking program it will still be required of you to download the TLEs from Space-Track and do some processing yourself. That will remain the case until some kind soul does for your favourite program, what Northern Lights Software has done for NOVA - or - some agency like AMSAT is eventually authorised to

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

redistribute element sets which have been altered to suit our purpose. A few other possible solutions are on the agenda but they could take some time and in some cases may never happen. For this reason alone it would be wise to follow Tom's advice and establish an account - now. It seems that at least for the immediate future no other agency - OIG, Celestrak or AMSAT, as examples - is authorised to re-issue the kep data from Space-Track in suitably modified format. In my own case I'd love to see someone within AMSAT develop software to "massage" the element sets from Space-Track so they could be used more easily in commonly used tracking programs like Instant Track and WiSP32. In the meantime it would be appropriate for us all to stop for a moment and remember the great service offered in the past by the Optical Imaging Group at Goddard and the tremendous work done by Tom Kelso in bringing us the keplerian element service we had all become accustomed to having at call and free of charge.

NOVA version 2.2a tackles TLE issue head-on

Nova for Windows version 2.2a is now available. It includes automated internet download from Space-Track as well as a Keplerian element extractor utility for managing Space-Track's general catalogue of 8,500 satellites. NOVA is the first amateur radio satellite tracking program that I know of to be updated to include this facility. Updates to existing licensees of Nova for Windows are free, go to <http://www.nlsa.com> for downloads. Nova users will find this a convenient answer to many of the current difficulties being experienced by users of the Space-Track elements. Here's hoping that other software developers will follow suit.

Latest P3E design meeting in Marburg

A P3E satellite design review meeting was held in Marburg Germany from January 26th through January 30th. The primary focus of this meeting was the design of the IHU-3 and the CAN-Do interface. In attendance for AMSAT-NA were Bob McGwier N4HY, Bdale Garbee KB0G, Stephen Moraco KC0FTQ, Lyle Johnson KK7P, and Chuck Green N0ADI. AMSAT-DL was represented by AMSAT-DL President Peter Guelzow DB2OS, Prof. Dr. Karl Meinzer DJ4ZC, Hartmut Paesler DL1YDD, Gerhart Metz DG2CV and 3-E Project Manager Heike Straube. A great deal of progress was made during the week. A detailed task and schedule list was prepared for completion of IHU-3 and related tasks over the next several months. AMSAT-NA President Rick Hambly W2GPS, who spent the week in Germany and Austria on business, joined the meeting on Saturday, January 29th. This was Rick's first visit to AMSAT-DL in Marburg. Rick was very pleased with the warm reception he received and with the great progress that has been made on the P3E satellite. [from AMSAT News Service]

ar

2006 Callbook: *we need help!*

We are about to start on the production of the next issue of the Callbook.

If you have any amendments which need to be made to the non-callsign information published in the 2005 issue, please let me have it ASAP.

For changes to the actual callsign information, make sure that any changes of detail reach the ACA before 30th June.

Also, we would be happy to receive photographs which may be suitable for the front cover.

E-mail to
callbook@wia.org.au
or by post to
Callbook PO Box 2175
Caulfied Junction 3161

Brenda VK3KT

Contests

Ian Godsil VK3JS

Contest Calendar March - May 2005

March	5/6	ARRL Intl. DX Contest	(SSB)
	12/13	RSGB Commonwealth Contest	(CW)
	19/20	John Moyle Field Day	(CW/SSB/FM)
	19/20	Russian DX Contest	(CW/SSB)
	26/27	CQ WW DX Contest	(SSB)
April	2/3	Marconi Contest	(CW/SSB/RTTY)
	2/3	SP DX Contest	(CW/SSB)
	2/3	EA WW RTTY Contest	
	9/10	Japan Intl. DX Contest	(CW)
	16	Holyland DX Contest	(CW/SSB)
	16	TARA Skirmish Digital Prefix Contest	(PSK)
	22	Harry Angel Sprint	(CW/SSB)
	23/24	SP DX RTTY Contest	
	23/24	Helvetia Contest	(CW/SSB)
May	7/8	CQ-M Intl. DX Contest	(CW/SSB/RTTY)
	21/22	Baltic Contest	(CW/SSB)
	28/29	CQ WW WPX Contest	(CW)

Greetings to all readers,

We all know that in Australia the business of contesting is not highly regarded by the majority of amateurs – you know the attitudes such as "Oh hell, another b... contest", or "I'm not really in the contest but I don't mind giving out a few numbers".

The first of these approaches is an honest straight-out approach; the second really an attempt to have a bet each way, with the real possibility of frustration for a serious station that gets caught up with this type of operator.

Not for a moment do I expect that attitudes will change in 2005, but it leads me to something that was brought to my attention late last year and may also be a pointer to a new trend emerging.

Gentlemen's Agreement

There would be no amateur in this country who is unaware of the fact that the lower end of our HF bands has been the place to find CW signals. Yes, there is a Band Plan published in the Call Book, but by and large the division of the spectrum is by mutual agreement, usually called a "Gentlemen's Agreement". This applies equally to using a 20 metre frequency for SSTV, as to not using FM on 52.110 MHz or 144.100 MHz, or not using SSB on 146.500 MHz.

With the deregulation of CW and the welcome addition of new callsigns to the HF bands, these Gentlemen's Agreements were not annulled.

It was, therefore, most upsetting to become aware that now, in international SSB contests, it is becoming noticeable to hear voices calling "CQ Contest" in the CW band segments. I can understand why it happens, but when VK operators join in willy-nilly I think it very poor practice, as we all know the long-standing rules. To me this shows up the Amateur Service in a very poor light, whether it be in Australia or in DX countries. In the latter case, many of them have designated contest sub-bands, so those operators may well be in a double breach of regulations and Gentlemen's Agreements.

I would like to hope that all VK and ZL operators would abide by the time-honoured practices of keeping sections of bands for specific purposes. This way we show ourselves as disciplined and responsible — good indicators of a self-regulated hobby.

This does not mean that contesting can no longer be enjoyed and even grow. It does mean that we continue to abide by the "rules and spirit of the contest". Please give this serious consideration.

2005 Australian Contests

A complete list of VK contests is on the WIA website, as well as in the Calendar above.

YOU can help make each event enjoyable both for yourself and everyone else participating. Please note the dates that interest you and "prepare for action"!

73 and good contesting,

Ian Godsil VK3JS

Results: John Moyle Memorial National Field Day 2004

Denis Johnstone VK3ZUX/8

Portable, 6 Hour

Station	S/M Op	Mode	Band	Points	Cert.
VK5SR	Multi -op	Phone	All	2746	*
VK3AWS	Multi -op	Phone	All	1170	*
VK3BOR	Multi -op	Phone	All	538	*
VK3BSY	Multi -op	Phone	VHF	396	*
VK3FRC	Multi -op	Phone	All	326	
VK5GRC	Multi -op	Phone	All	264	
VK4AOE	Multi -op	Phone	HF	186	*
VK2EMU	Multi -op	Phone	HF	68	*
VK3ZPF	Single	Phone	VHF	1216	*
VK3XYC	Single	Phone	VHF	632	*
VK6ZN/2	Single	Phone	HF	210	*
VK1AI	Single	All	HF	94	*
VK2IRP	Single	All	HF	76	*
VK3JS	Single	Phone	VHF	76	*
VK3JMG	Single	Phone	HF	66	*
VK3MGZ	Single	Phone	HF	44	*
VK5RG	Single	Phone	HF	40	
VK5VH	Single	Phone	HF	36	
VK1WJ/2	Single	All	HF	36	*
VK2AGC	Single	Phone	HF	26	
VK2BPB	Single	Phone	HF	10	

Portable, 24 Hour

VK3SAA	Multi	Phone	VHF	6646	*
VK2SRC	Multi	All	All	4984	*
VK3QM	Multi	Phone	VHF	3902	*
VK5ARN	Multi	Phone	VHF	3510	*
VK5BP	Multi	Phone	All	3154	*
VK3BML	Multi	Phone	All	2898	*
VK5AR	Multi	Phone	All	1658	
VK4BAR	Multi	Phone	All	1452	
VK2HZ	Multi	Phone	All	1363	
VK3EGC	Multi	Phone	All	1346	
VK2AFY	Multi	Phone	All	966	
VK4IZ	Multi	Phone	HF	930	*
VK4WIS	Multi	All	HF	752	*
VK5BAR	Multi	Phone	HF	566	*
VK4WIT	Multi	All	HF	296	*
VK4TWR	Multi	Phone	All	292	
VK2TWR	Single	Phone	VHF	2022	*
VK3KME	Single	Phone	VHF	1606	*
VK5NJ	Single	CW	All	290	**
VK3DBQ	Single	Phone	All	267	*
VK2KWM	Single	Phone	All	250	*
VK3UBM	Single	Phone	HF	216	*
VK5DG	Single	Phone	HF	200	*
VK4EV	Single	All	HF	156	*
VK3JS	Single	CW	All	110	*
VK3XOK	Single	Phone	HF	108	
VK3JS	Single	Phone	HF	40	
**	President's Cup				

HOME Station, 24 Hour

VK3FGN	Single	All	All	255	*
VK3KYF	Single	All	All	215	*
VK5JBJ	Single	All	All	211	*
VK3XBA	Single	All	All	117	
VK2XIE	Single	All	All	86	
VK3KQB	Single	All	All	64	
VK5NY	Single	All	All	63	
VK2KRR	Single	All	All	59	

Home Station, 6 Hour

VK3IO	Single	All	All	183	*
VK3TSR	Single	All	All	56	*
VK5EK	Single	All	All	49	*
VK3XKS	Single	All	All	48	
VK4BIF	Single	All	All	46	
VK2BQS	Single	All	All	45	
VK2JHN	Single	All	All	43	
VK2VD	Single	All	All	37	
VK3KK	Single	All	All	36	
VK2IGS	Single	All	All	6	

SWL, 24 Hour

Ray Ford	Single	All	All	171	

Check Logs

VK3CIS VK3ZUX VK5JGM

Comments from 2004 JMFD

Firstly an apology. I only received the last of the logs in August and then with the pressure of work was unable to complete the task until now. I had planned to retire early to allow time for this activity and then somebody offered me more money than my likely pension so I took the offer. Having moved to VK8 it took a while for the log submissions to catch up.

I was surprised and concerned by the number of submissions that had not properly followed the rules regarding log submission. Even those who submitted an electronic form of the log most simply called the log file JMFD2004. Hence it made life very difficult to separate them from the electronic file in which they were submitted, as most simply had the same file name. In the rules for next year there will a suggested file name format of 'Callsign_JMFD.*' In this way each of the electronic files will be unique. Paper logs were generally better in compliance with the rules.

There were 68 logs submitted and 28 people sent them in electronically. Many more stations took part than submitted logs, which is a pity as a number of stations that failed to submit a log could well have won some categories. Perhaps stations were not prepared to submit the log because they felt that their score was not in a winning range. I would like to suggest that in 2005 submit the log and you never know.

People who submitted logs even on paper did not always complete the declaration required by the rules or include their return address.

There were no logs submitted from VK7 or VK8 and only one traveller from VK6 put in his log. Perhaps the weather was too bad for the southerners but out west and up north I wonder what the excuse might have been? Maybe in 2005 this can change?

Many people wrote to thank Eric for his past service for this contest and I join them in thanking him for his considerable efforts in the past.

Some comments received: -

** The day for me was a great success. I don't often get out in the field much with my gear these days and really enjoyed the planning, setting up of my small operation and making the calls. All on the air were so keen to make contact and say g'day. My time was limited so only a few contacts were made but the spot I chose at the Avon Dam in the Southern Highlands of NSW could not have been better. The conditions were wonderful, blue skies and about 23 deg C. The bands were quiet and making contact was very easy and pleasurable. My gear*

worked wonderfully well with all of my 5 watts for the most part making the grade with the other contest stations.

• *Many stations refused to exchange numbers because the "three hours were not up" on the time used by the other station. Others waited for an extra 5 minutes past the hour to ensure that the rule was not contravened.*

• *Power source several fully charged batteries. It ended up very cold and very, very windy. Getting the gear home was funny, got 2 m yagi home with 3 elements bent and smashed folded dipole. Left HF dipole in the tree and the following day cousin's father tried out new slasher and you can guess what happened to 30m of feed-line? I saw the funny side but I am not sure about next year.*

Rule changes

I would like to suggest that the rules need revision and I am asking that people should think about a possible rule change and pass those comments to me at vk3zux@hotmail.com or via the WIA. The rule changes are mainly for simplification of the very complex scoring in use at present and to attempt to make it a little more equitable.

1. As far as rule changes there were several negative comments about use of the time blocks instead of the more straight forward three-hour rule between contacts as in other contests.
2. I believe that should be a simplification of the number of categories.

   There are simply too many categories. A station with very high scores claiming VHF only or all bands did not win an award, as they were 5th in that particular category, while a station with a lowly score claiming only HF could win first place. To simplify the number of categories will better allow stations who have worked very hard to get a good score to win an award. The alternative is virtually to issue a certificate for every log submitted.
3. Portable or Home. The home station should be given some distance multiplier (half of the Portable Station) 24 hour or 6 Hour. Same as every other Contest.
4. The weather and other commitments regulate the activity so there is no guaranteed result. The ideal of the contest is to promote portable operation and it has achieved that aim. However, there is an aim to get more activity and this can be achieved by having people submit their logs. Perhaps a certificate of participation for all submitted logs as well as the awards for fewer categories.
5. Phone or All mode. - There was only 8 logs that claimed All mode and only 2 that claimed CW. CW is moribund and the activity does not require a separate category, though a 2 point advantage for using CW could provide an interesting experiment? Other modes like FSK441 etc should not get any premium?
6. HF or VHF – A number of stations submitted All Band entries as well as HF only and VHF only. Many of the highest scores were VHF only. I do not believe that there needs to be as great a separation between the bands now that everyone has an equal go on all bands.
7. The differential multipliers for VHF produced some very large numbers.

Simply food for comment.

ar

Silent key

Murray Collings VK8NUE

Born Adelaide 16th Feb 1920 and passed away in Alice Springs 28th July 2004.

Murray attended Pultney Grammer School in Adelaide, his interest in radio started early, with his first job driving a delivery van for a radio shop and studying radio at the School of Mines.

Murray served in signals in the army during WW11 and personally experienced the bombing of Darwin..

His interest in radio continued throughout his life in the outback where initially radio was the only means of communication and in 1985 joined the ASARC, studied for and obtained his amateur licence.

Murray enjoyed ham radio, particularly running the Travellers net on 21Mhz.

He was a member of Masonic Lodge and a keen lawn bowler.

Murray's other interest early in life was horse riding and it was through this activity he met his wife Grace, who served in the WAAR working in meteorology in Melbourne and enjoyed horse riding with friends at Ringwood in Victoria.

Murray and Grace married in 1946 and in the Northern Territory their life together began, firstly on Ti Tree and Pine Hill Stations, then they took up crown land 80 miles east of Alice Springs, which Grace named Ringwood. He drove his cattle and horses from Pine Hill to Ringwood, taking 6 weeks. At first living was very basic but soon Murray built their first homestead, masonite walls corrugated iron roof and concrete floors.

With wife Grace and later daughters Margaret and Judith established, he developed the station, drilling and equipping bores for water, completing miles of fencing, building yards, mustering cattle and setting up electricity generation, and in the midst of all this found time to win prizes at the Alice Springs Show for cattle, produce and equestrian events

This strong willed, determined yet reserved man quietly achieved a great deal during his long, productive and satisfying life. He instilled confidence in people and worked along side his employees thus earning their respect and loyalty.

Murray was a true outback pioneer.

Murray is survived by wife Grace, daughters Margaret and Judith.

Jeff VK8GF

Results: Remembrance Day contest 2003

Alek Petkovic VK6APK

VK6 wins again!

A big effort by the VK6 Division means that the RD trophy will remain in the West for another year.

As a member of the VK6 Division, I can verify that there was tremendous enthusiasm and a strong desire to put in a winning effort this year. Congratulations to all who participated and made the win possible.

As can be seen from the results, the win was only by the narrowest of margins. VK4 was right up there with VK6.

The task of checking logs and collating results was made very easy by the high standards of submitted logs. I believe that this is due to the good understanding of the rules and the increased use of computers for contest logging.

Here now are the results for the contest.

Divisional Scores

Table 1 shows the placing of each division along with their overall Improvement Factors.

Table 1: Divisional Ladder

1st	VK6	1.420
2nd	VK4	1.417
3rd	VK2	0.956
4th	VK5/8	0.870
5th	VK7	0.798
6th	VK1	0.578
7th	VK3	0.395

The total scores in both HF and VHF are shown in Table 2.

Table 2: Divisional Scores

Div'n	HF	VHF
VK1	499	65
VK2	3784	126
VK3	2172	710
VK4	2285	2842
VK5/8	2218	1859
VK6	1586	9387
VK7	1640	512

For those who wish to know how the final score for each division is calculated, I have included the following live example of how it is done. I will use the VK3 Division's figures in the calculations.

First is the calculation of Benchmarks for VK3 for 2001 RD Contest.

2002 Benchmarks

(As published in 2001 results and 2002 rules)

HF 3461
VHF 7089

2002 Scores

(As published in 2002 results)

HF 2601
VHF 2218

Formula:

2003 Benchmark = (0.25 x 2002 Score) + (0.75 x 2002 Benchmark)

Calculations:

HF

2003 Benchmark = (0.25 x 2601) + (0.75 x 3461)
2003 Benchmark = 650.25 + 2595.75
2003 Benchmark = 3246

VHF

2003 Benchmark = (0.25 x 2218) + (0.75 x 7089)
2003 Benchmark = 554.5 + 5316.75
2003 Benchmark = 5871

Those 2 benchmark figures are the scores the division needs to beat to register a positive improvement factor in each section of the contest.

Now to calculate the final score, let's use the points that the VK3 division scored in HF and VHF this year.

Formula:

Improvement Factor = 2003 Points divided by 2003 Benchmark

Calculations:

HF

2172 / 3246 = 0.669

VHF

710 / 5871 = 0.121

The two improvement factors are now averaged to give the division's final result.

Formula:

Overall Score = (HF Improvement + VHF Improvement) / 2

Calculation:

Overall Score = (0.669 + 0.121) / 2
Overall Score = 0.790 / 2
Overall Score = 0.395

Here are the Benchmark figures for the year 2004. This table will also appear in the rules for 2004. As above, the formula for determining these values is:
2004 Benchmark = (0.25 x 2003 Score) + (0.75 x 2003 Benchmark)

Table 3: 2004 Benchmarks

Div'n	HF	VHF
VK1	586	158
VK2	3909	131
VK3	2978	4581
VK4	3203	1687
VK5/8	3234	1711
VK6	2189	5583
VK7	1584	829

The following table shows the total number of logs received over the last 4 years. * Denotes winning division.

Table 4: Logs

Div'n	2000	2001	2002	2003
VK1	9	15	8	8
VK2	41	41*	25	41
VK3	137	57	57	43
VK4	78*	40	53	76
VK5/8	46	51	54	41
VK6	59	47	72*	74*
VK7	41	24	27	17
Total	411	275	296	300

Individual Scores

The individual scores for entrants are listed below. Certificate winners are denoted by an asterisk (*) and the top Australian scores in each section by a hash (#). Multi operator certificate winners are denoted by (M). Certificates will be issued to the top operators in each division as deemed by the contest coordinator. Where a multi operator station holds the top score, a certificate will also be issued to the top scoring single operator in that section. Where a single operator station holds top place, only that station will receive a certificate.

VK1

HF Phone

AI	123*
LW	104
DW	60
KMA	30

HF CW

LK	140*

HF Open

KMB	42

VHF Phone

DW	40
KMA	25

VK2

HF Phone

XT	263*
WHQ	228
DCL	200
JKK	161
CZ	144
CAA	140
IO	133
BDT	106
APP	61
PS	59
YW	50
LCD	48
IRP	39
KCO	35
BUI	24
EJK	19
CIF	14
RL	11

HF CW

OI	208*
BHO	182
TM	164
EL	100
WL	96
CW	72
EAH	48
RJ	46
BCC	42
MQX	30

HF Open

BO	343*
AYD	253
BPL	234
YN	157
ASU	74

VHF Phone

BDT	33
LCD	23
HEW	16
ZCV	16
ZCM	15
BZD	12
EJK	11

VK3

HF Phone

SY	250*
AHY	184
AVV	111
AMW	91
DS	87
JK	84
MNA	84
KTO	77
ATN	68
ADW	62
AAM	54
BCL	51
SM	49
GH	47
GHA	47
DY	46
NA	34
AKT/4	27
KBD	24
KK	21
DCP	20
JSS	18
ABP	15
EX	12
XH	7
KQB	6

HF CW

KS	94*
VB	80
BKU	82
ANJ	70

HF Open

JS	199*
OZ	71

VHF Phone

MID	185*
JK	172
JS	55
HFS	54
GH	47
JWT	40
KK	40
XJU	39
XH	30
AKT/4	26
EX	22

VK4

HF Phone

WIT	254*
BAY	190
FNQ	175
WIL	155
BTW	75
BAF	65
AWL	60
PKT	54
ZA	37
DFG	34
ACB	30
ACC	30
PS	30
TE	29
AAH	28
PJ	25
JAM	24
FU	20
FK	17
KET	17
GM	8
AA	3
DUG	3
PAL	2

HF CW

BUI	224*#
COZ	40
RE	28
IW	20

HF Open

LT	237*
IZ	107
GZ	94
CCV	90
TJ	57
EV	23

VHF Phone

AA	275*
ZDX	210
ZBV	182
AR	158
RC	137
PKT	134
EHT	125
AML	117
LO	113
ZA	95
AFS	92
HSV	79
WIT	76
KF	71
PAL	66
KLC	61
TJS	60
EV	58
OE	56
PS	53
GZ	52
ZM	50
JUS	47
PJ	46
3CE/4	42
KET	42
ARS	39
FNQ	36
JAM	36
KJD	30
BB	29
BRC	29
MC	24
VKD	24
KD	21
AAH	16
DUG	13
LU	13
ACC	11
IA	11
OD	10
GM	3

VK5/8

HF Phone

AY	391*#
AIM	248
BP	187
DJ	139
EMI	106
KMC	83
XY	70
RV	62
SIG	61
ASN	55
NN	51
TW	45
RK	24
BVJ	23
JQ	20
OF	16
AJW	14
ATQ	14

HF CW

UM	152*
BGL	86

HF Open

ATU	228*
WO	105
RG	38

VHF Phone

USB	398*
HWF	232
MX	180
ZMB	179
XY	173
AR	116
SE	94
ATQ	92
KLD	80
RV	50
KMC	48
ZKK	47
OQ	41
AVQ	33
AY	29
ZLV	25
AMK	22
OF	20

VK6

HF Phone

CSW	146*
APK	122
AB	120
ADI	108
JP	93
CB	86
KRC	59
KHD	37
KG	36
ABS	30
SAR	29
AR	24
JIP	19
EH	13
KH	11
NKB	3

HF CW

AFW	168*
AF	68

HF Open

LC	177*
WW	166
RZ	40
NGW	31

VHF Phone

XRE	514*#
APK	364
TKR	360
CSW	347
ANC	340
JIP	340
ZBP	340
MIN	277
BDO	259
HRC	256
ZAR	256
SAR	228
JP	225
AD	222
KAD	207
SAA	206
SCS	206
SH	206
AR	200
NU	200
HAO	191
HGR	190
KY	189
VHF	186
ZKO	170
TRA	157
TT	149
KG	147
UMG	133
NKB	130
RRG	125
RO	109
EH	106
CRO	101
ARO	100
SIX	100
RZ	90
VMS	82
YDH	75
ZYZ	65
HCJ	64
HK	62
TS	55
KTN	54
KHD	45
AF	33
JRC	30
SMH	30
PM	13

VHF Open

FJA	523*#
NGW	262
WW	68

VK7

HF Phone

CK	247*
TW	237
KC	185
VH	52
KH	39
JGD	34
RM	30
PP	20
AK	15

HF CW

RO	204*
EE	128

HF Open

GN	449*#

VHF Phone

KRW	201*
JGD	136
RM	91
TW	72
VH	12

Overseas

HF Open

ZL1PZ	54

HF Phone

ZL2ADN	28

SWL

ZL-2001	59

Check Logs

ZL2AJB
P29AIF

In closing, let's hear from Austin, VK5WO.

Another good RD Contest being able to participate and remember our fallen fellow amateurs. This contest has special memories for me; first contest in 1950 with 40 contacts, late 50s top VK5 open with 330 contacts. I think I have only missed 2 contests since 1950.Great to meet up again with VK2BO Jim, VK2XT Bill and VK4LT Al; They have featured in my logs for many years. Bill VK2XT is 91 years and still going strong. I am only a boy at 79. 73s Austin VK5WO.

Thanks Austin. I hope there are plenty of RD Contests left in all of us.

73, Alek. VK6APK

ar

Over to you

One amateur's advice

Hello Friend,

I read with interest your enquiry regarding the WIA and your hopes of setting up a UHF CB Radio club in the Wahroonga area.

I am a licensed amateur radio operator, a member of the WIA and a member of the local amateur radio club in our area. The amateur radio club is the Hornsby & Districts Amateur Radio Club. Further information on the club can be seen on the following link http://marconi.careless.net/hadarc/intro.html

I have and also operate CB radio (an Icom IC-400Pro) and have operated CB radio since the late 1960's (pre licensing days when 27.240, the old handphone frequency was the only channel available). I had my time on 27MHz, then progressed to UHF when it was first introduced back in the early 1980s (or was it late 1970s? – Seems like a long time ago) and progression has led me to amateur radio. In fact I was quite lucky to be one of the first people on UHF CB before Phillips released their FM-320 as I knew several Phillips technicians who were trialling the FM-320 around Sydney at that time.

Radio is a wonderful hobby whether it is just chatting to mates, chasing DX or getting into the technical aspects of radio and antennas. I have seen CB radio clubs come and go since the early days of the KT (Kilowatt Tango Club), Southern Cross DX Club and many more I have forgotten. Without trying to sound negative, the one main problem with a local CB Radio club was the general anonymous nature of CB Radio and the difficulties in communicating with the "good radio operators" while trying to ignore the associated mess. I am sure you have listened to some of the local UHF CB repeaters around Sydney and heard the mess that anonymous users create. With amateur radio, no one is anonymous and that virtually removes the problems which have and always will persist on CB Radio. Another problem is that just one local CB radio club cannot offer the services, assistance and network that amateur radio has set up globally through its various national bodies such as the WIA in Australia, the RSGB in Britain and the ARRL in the USA and of course the input from our local amateur radio clubs who make this network possible.

Amateur Radio has always been seen as perhaps too hard to get involved in because of the associated exams and required technical knowledge needed to pass exams. It would seem you and your friends are genuinely interested in radio and I am not sure if you are aware of the changes to the amateur radio service that will begin early 2005.

In 2005, the ACA will be introducing a "Foundation" amateur radio licence. This licence will be similar to the recently introduced Foundation licence in the UK and will require a much lower level of required technical knowledge but will allow you to operate amateur radio on several amateur bands with 10 watts of power. (note that a standard UHF CB is only 5 watts and CB Repeaters are usually also only 5 watts, amateur repeaters generally are anything from 20 watts to 100 watts+ which allows greater coverage of an area).

It is believed that access to the amateur bands for Foundation licence holders will allow operation on the following bands;

80 metres (3.5 - 3.7 MHz)
40 metres (7.0 - 7.3 MHz)
15 metres (21.0 - 21.45 MHz)
10 metres (28.0 - 29.7 MHz)
2 metres (144 - 148 MHz)
70cm (430 - 450 MHz)

The full amateur review outcome can be downloaded from the ACA website on http://www.aca.gov.au/aca_home/licensing/radcomm/amateur_review/amateur_review_outcome.pdf

If you and your friends are seriously interested in radio, I urge you guys to consider talking to HADARC and perhaps sitting for the Foundation Licence when it is introduced.

It would be much less trouble than setting up a CB club, attempting to obtain a CB repeater licence (which at this stage will not be possible as all UHF CB repeater allocations in and around Sydney are taken and CB repeater licences are subject to operation within a radius which I believe would not allow Wahroonga to obtain a licence due to UHF CB Channel 7 (Pennant Hills) being in the immediate area). You also need to consider repeater site location, maintenance, licensing and of course abuse of the repeater. Repeaters must also be serviced by a suitably technically qualified person who would be nominated on the ACA repeater application and must be a type approved repeater approved by the ACA for use on the UHF CB Band. This could end up being quite a financial hole for a club with a small membership. If your interest is in WIA affiliation then you must also consider the requirements for affiliation with the WIA.

With the introduction of the Foundation Licence, amateur radio will not be the technical obstacle it has been in the past and combined resources of club membership, WIA membership and a very high level of technical expertise allows utilisation of those resources by all amateur radio operators.

As mentioned, I am a member of the Hornsby & Districts Amateur Radio Club and the club maintains repeaters on both 2 metres (147.250 MHz) and 70cm UHF (439.975 MHz). If you have a scanner, then tune into the club net on Mondays at 8:00pm and have a listen. Discussions are basically on anything you wish to speak about and everyone gets a chance to have their say regardless of power into the repeater. You may also consider listening to the WIA broadcasts on Sunday mornings at around 10:00 am on 146.850 MHz. The broadcast is also repeated on the same frequency at 7:30 pm on Sunday nights.

Amateurs have set up very polite protocols on repeater operation so using an amateur repeater is a pleasure without the normal interruptions and power games we have on the UHF CB repeaters in Sydney. If you have a shortwave radio, we also have a Wednesday night club net on the 80 metre band (3.608 MHz) at 8:00 pm for those who like to play with HF radio. 80 metres is a challenge and you learn a lot about antennas on the HF bands and it is an amazing band to hear the static and crashes of distant and local electrical storm disturbance.

As well as the HADARC Repeaters, to give you an idea of how many repeaters

an average home base can set up, at present I have 16 x 2 metre repeaters and 12 x 70cm repeaters programmed into my radio. Of these, several repeaters support IRLP (Internet Relay Linking Project) which allows you to literally "dial up" over 1,500 repeaters in over 20 different countries in the world and EchoLink which is a system that links your PC to a repeater regardless of where you are in the world. With EchoLink all you need is an amateur licence, a PC and an internet connection. Foundation power of 10 watts is more than enough to allow global operation through IRLP and EchoLink Repeaters.

Links for IRLP and EchoLink can be found at:

http://www.irlp.net/ for IRLP and

http://www.echolink.org/ for EchoLink.

Amateur radio is global and, because of the combined resources of amateur radio clubs all over the world, becomes an extremely vast radio resource for usage by all licensed amateur radio operators. As the UHF CB band (476.425 – 477.400 MHz) is only available in Australia and because of international protocol on overseas transmissions, UHF CB cannot possibly reach the places and countries that amateur radio can. The introduction of a Foundation Licence is exciting because it finally opens up amateur radio to those who can't quite get their interests around resistors and transistors and just want to chat to the world. It also allows you to have continued access to more technical orientated people and learning becomes much easier when you have hands on experience. This allows Foundation operators to continue to higher classes of licences at their own pace while being able to enjoy amateur radio and what it offers or if technical things don't appeal to you, then the Foundation licence still allows you to chat with amateurs all over the world and of course locally.

Please consider contacting our secretary, she can put you in contact with the man to speak to regarding tutoring and exams. The Foundation exam syllabus has not been completed as yet, but Tony can contact you when examinations commence. In the meantime, you could also try coming up to Mount Colah to our monthly club meetings and see for yourself what our club is all about. Our Secretary can inform you of the next meeting which I believe is next February (fourth Tuesday of each month at 8:00 pm).

We do have some current UHF CB radio operators who are in the process of sitting for their amateur radio licence or have already obtained their licence so you will find HADARC is a friendly club regardless of your interests in radio and there is always great advice to be obtained by the combined knowledge of all persons in the club and of course our affiliation with the WIA.

As the WIA Director mentioned, the WIA promotes amateur radio and represents us as a national body to the ACA and represents us globally as Australian amateurs. The amateur radio fraternity welcomes anyone with an interest in radio and your local amateur radio club is the best place to be introduced to amateur radio. Your local amateur radio club can also provide tutoring and assistance to help you obtain an amateur licence. Non amateurs are also welcome as members of HADARC and as a member, while you cannot utilize the repeaters the club provides, we can assist with tutoring and help you to become an amateur radio operator so you can enjoy the benefits of club membership and the friendship that exists in our club. Getting licensed is not that difficult, it just needs a little bit of time and commitment.

If you require any further information, please email me at any time and I will be happy to answer any questions you may have and I look forward to perhaps seeing you one day at our monthly club meeting. Amateurs are not snobs and we welcome all those who share the same love of radio as we do.

Peter Tolmie VK2ZPT
for and on behalf of The Hornsby & Districts Amateur Radio Club.

ar

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

Better than watching geckoes get flies

My copy of AR just arrived today, and as usual, I have had my first scan reading. Over the next week, I will read it in detail from front to back and then remove items of current or potential interest. I did notice the demise of the DX column, but I have always done my listening by searching around anyway. I have tried this stuff on the Internet, but my machine is so slow, my connection varies in speed and I get frustrated when the thing locks up during a down load. Don't forget - I live in Fitzroy Crossing. For entertainment, we switch on the kitchen light and watch the geckos get moths and little flies. During the wet season, they are joined by frogs that are also out for a feed.

So, what do I get out of the magazine? One of the first things I try is antennae ideas. Over the years I have built long wires, tuners, dipoles, end feeds, quads, trapped verticals, trapped yagis, etc. This month's article on the 160m antenna is great as that is one thing I have been trying to get on to efficiently for years.

I don't get a lot of time for my Ham work and take what time I can grab. If you could put together a series on getting started on satellite radio that would be helpful. What antennas? How do I work out what time of the day? And what frequency? Always FM? What are the protocols? What does all that gobbledygook mean about Kepler elements? How do I interpret the satellite pages? What about a reprint of the band plans so I know what frequency to call on?

So, dear editor, don't give up. There are lots of us who read the magazine and do "stuff" but don't always have the time to tell you what a great job you do.

Keep up the good work and 73 from Fitzroy Crossing

Peter VK6APS

VHF/UHF - an expanding world

David Smith VK3HZ - vk3hz@wia.org.au
Leigh Rainbird VK2KRR - vk2krr@talstra.com

Weak signal

David Smith - VK3HZ

Everything is getting back to normal now following last month's overload. So, I'll try to summarise the happenings over the last few months, if the editor will allow me the space.

The 29/11 was a good time in several areas. Conditions between Melbourne and Adelaide were good, with Charlie VK3FMD managing to work Roger VK5NY on 23 cm. On the east coast, there was an opening from VK2 into ZL. Ross VK2DVZ, Neil VK2EI and Gordon VK2ZAB report working Bob ZL3TY, Brian ZL1AVW, Ray ZL2TAL, Nick ZL1IU and David ZL1BT and ZL1AVZ on 2 m and some of them also on 70 cm.

Then in December, there were a number of Sporadic E openings of note. On the evening of 8/12, David ZL1BT reports working Trevor VK4AFL, Peter VK4APG, Rob VK4ZDX and Bill VK4LC on 2 m. Signals peaked to S9 with a best distance of 2319 km. On the 10/12 Bob ZL3NE/1 in Auckland reports briefly working VK2BHO on 2 m.

Phil VK3YB reports that, just before lunch on Christmas Day, a very intense opening occurred into VK4 pushing his S meter into previously unexplored territory. Stations on the northern end included VK4's CV, ARN, CY, CDI, AML, KK, ZQ and AFL. At the southern end, VK3's AUU and KAQ were also involved. The opening extended into eastern VK5 where VK5's DK and NC also worked the northern stations. That evening, an opening occurred between VK7 and ZL for nearly 2 hours. Mike ZL3MF reports working VK7's ZOO, YBI, BBW, KRR, JG, XQ and YBY. Deon VK7YBI peaked to well over S9. Murray ZL3MH also worked these station plus Norm VK3DUT. Murray was heard by Andrew VK3KAQ on Mt Dandenong, but they did not make a contact.

On the following morning 26/12, Brian VK5UBC reports working VK4's AFL, LC, KSS and DH. Signals peaked to S9, but the opening only lasted for about 10 minutes. That afternoon, another brief opening across to ZL saw VK2's DVZ, EI and ZAB work ZL1's BK, TN and SWW at S9 levels

On New Year's Day, Robbie VK3EK reports working VK4's BLK, KK, AFL and ZAA.

The next morning, Leigh VK2KRR reports hearing the Alice Springs 2 m beacon via a sporadic E opening. The signal was around S7 for about 10 minutes, but no stations could be raised.

On 10/01, another sporadic E opening occurred at about midday between VK4 and VK2/3. Leigh VK2KRR reports working John VK4KK (S9+) and Ray VK4BLK (S7) both at Yeppoon (near Rockhampton). Alan VK2AW also worked into VK4. To the south were VK3HZ, VK3AFW and a number of others. Bryon VK3YFL came home from work when he heard of the opening, and ended up also working John from his car (vertically polarised) on his way back to work. The opening lasted for more than an hour, with very strong signals from the north (S9+20).

On 06/02, a strong high settled on western Victoria, producing good conditions between VK2, 3 and 5. At the western end were VK5's ZK, UBC, ZLX, BJE, RO, JL and BQ. In VK2, contacts were had by VK2's KRR and DO. Also involved were VK3's KEG, AXH, HZ, II, FMD, AUU, UH, AMZ and AFW. Several Melbourne stations worked Les VK5JL at Grange, a beachside suburb of Adelaide. This is difficult to achieve because of the Mt Lofty ranges, immediately to the west of Adelaide. Unusually, the opening lasted until after midday before dying out.

In summary, so far this summer we've had high Sporadic E activity, but good tropo conditions have been limited. Only one tropo opening has occurred between VK3 and VK6, and VK2/4 to ZL tropo openings have also been very limited. Let's hope that the remainder of summer brings better conditions.

In early January, Ron VK3AFW spent some time at the summit of Mt Buller with his portable station, consisting of an IC706MkIIG with 5 el beams for 2 m and 70 cm. His best contacts were, on 2m VK4ABW near Townsville - 1988 km - and Brian VK5UBC/P York Peninsula - 886 km – and on 70 cm Peter VK5ZLX - 730 km. He also worked into Adelaide proper, to Les VK5JL on 2 m.

VK/ZL attempts on 2.4 GHz

Steve ZL1TPH reports on attempts to work across the Tasman on 2.4 GHz. On Friday 14/1, Steve worked Ross VK2DVZ on 144, 432 and 1296 (2100 km) from his portable site at Muriwai. Numerous attempts were made on 2.4 GHz throughout the afternoon to Ross, but no contact was made. Nick ZL1IU also made attempts to Ross at the same time. In the evening Brian ZL1AVZ also from Muriwai and Nick made attempts on 2.4 GHz to Ross VK2DVZ and also Adrian VK2FZ in Sydney. Although no contacts were made it was an encouraging start and will hopefully inspire others to participate. Stations involved -- ZL1AVZ ZL1IU ZL1TPH VK2DVZ VK2FZ - till the next opening.

People

Gordon VK2ZAB has had a major family crisis and, as a consequence, has closed down his station and is in the process of selling off all of his equipment. This is a substantial loss to the VHF/UHF weak signal community, of which Gordon has been a key member for a very long period. We wish Gordon well for the future and hope that everything turns out for the best.

Guy VK2KU has had some misfortune at his new QTH and will probably be off air for several weeks. On 01/02, a prolonged and severe electrical storm caused fairly extensive damage to his shack equipment. Initial checks showed lots of blown fuses, a dead radio, a HV supply which trips the circuit breaker when turned on, and both az and el rotator controls out. Some of it may be just blown fuses, but certainly not all!

Roger VK5NY reports that he has a new VK2 QTH at Bowraville in a deep valley, but under the northbound aircraft

flight path from Sydney to Brisbane so there is hope at QTH No 2 for some VHF contacts. In time he will have a rig set up there on VHF. His present location at Mount Wilson will continue to be his home base with breaks to VK2.

Gippstech 2005

As you may see elsewhere in the magazine, Peter VK3KAI is calling for papers for this year's Gippstech conference. This is a not-to-be-missed event for anyone interested in weak signal VHF/UHF/Microwave operation. It's also a good opportunity to catch up with people with a common interest. Mark it in your diary now – the weekend of the 9th and 10th of July.

Summer VHF/UHF Field Day

The Summer VHF/UHF Field Day on 15th and 16th January saw a good turnout of portable stations in VK3, despite the initially inclement weather. Of the stations worked from my QTH in Melbourne, 15 were Field Day stations - perhaps the most memorable being David VK3KAB and Alan VK3XPD in the Cranbourne Tip! There were a number of field stations out in the Geelong district too, and a number of locals from that area popping up to work them. I understand that quite a few stations were out in VK5 also. However, the other states were very quiet.

As of 02/02, John VK3KWA had received Summer VHF/UHF Field Day logs from VK2AES, VK3's EK HZ JS UH ATL AWT CAT KAI TRD YDK YFL, VK4's EV DFG and VK5's AR DC FD MX OQ ADE AIM.

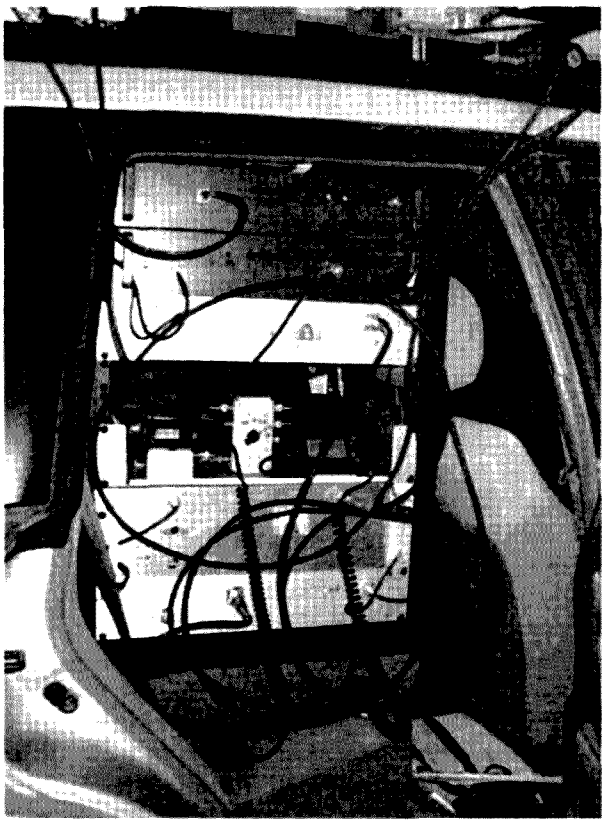
Peter VK3KAI was out on Saturday afternoon in his rover setup, working from a number of gridsquares on all bands from 50 MHz to 10 GHz. What's more, Peter is able to operate mobile on all of those bands. The photograph of his setup shows all of the antennae sprouting from the roof of his vehicle, consisting of: 6 m – 144 MHz 5/8 whip, 2 m - Big Wheel, 70 cm - 2 x stacked Big Wheels, 23 cm - Alford slot, and 2.4 GHz to 10 GHz - VK5ZO slotted waveguide antennae. Inside the vehicle, a 19-inch rack holds all of the equipment, consisting of an IC706IIG for 6 m, 2 m & 70 cm, an FT-817 as an IF driver, and transverters for 1.2 to 10 GHz. Nearly all of the transverters and antennae are homebrew. The system is being constantly improved, so we can expect to hear more big signals from Peter on future Field Days.

Microwave

Russell VK3ZQB reports that conditions suitable for microwave contacts have been fickle this season, probably worse than last season. They have had a few sessions with poor results but it has shown up some problems with the equipment. So it has been full-on at the workbench repairing gear in case the band opens.

On the evening of 24/1, Russell worked Col VK5DK and Trev VK5NC on 10 GHz from Port Fairy to Mt Gambier. Signal reports were 5-9+ and at times it was possible to hear Colin with the dish pointing 180 degrees off the path. They tried 24 GHz but had no success at all. They will have to check the 24 GHz gear and perhaps try and make contact over a shorter path to prove the gear. With the lack of good tropo openings they are getting a nervous twitch and will jump at anything that looks like a tropo opening.

Charlie VK3FMD, Alan VK3XPD, Chas VK3PY, David VK3XLD and Bill VK3AMH have also been involved in



Rover rack

Rover front

microwave hilltopping in recent times. While contacts on 10 GHz seem to be readily achieved, 24 GHz is proving much more of a challenge. One of the reasons is that attenuation due to moisture in the air is substantial at the higher frequency. The two bands are quite different in characteristics.

On the other side of the world, it seems that Brian WA1ZMS, just can't get enough Gigahertz. He reports that on 21/12, WA1ZMS/4 worked Pete W4WWQ/4 on 403 GHz CW for a new distance record of 1.4 km. Signals were very weak on the W4WWQ end, while several dB of margin existed on the WA1ZMS end. The QSO exceeded the stations' former "best DX" on 403 GHz of 0.5 km. It also conquers the 1 km barrier for amateur frequencies above 400 GHz - except for visible light.

Beacons

Terry VK3ATS in Mildura reports that the Broken Hill VK2RBH 70 cm beacon is off the air at the moment due to equipment problems/failure.

The VK2RSY beacons at Dural are finally getting some much-needed attention. The 23 cm beacon on 1296.420 MHz has its horizontal slot antenna higher up the tower. The other beacons currently online are those on 10 m and 70 cm. The 2 m beacon still requires a rebuild.

Colin VK5DK reports that the new VK5RSE 432.550 MHz & 1296.550 MHz beacons are now on air from Mt Graham, 40km NW of Mt Gambier. The old 70 cm beacon had repeatedly failed and was finally replaced. Frequency stability should be very much improved. Both beacons are driven by a common keyer. The 23 cm beacon uses 2 x 10 element yagis pointing east and west at the top of a 30 m tower, and power is approx 25 watts. The 70 cm beacon uses 2 x 8 element yagis east and west at the 15 m mark on the tower. Thanks to Russell VK3ZQB for the construction of the new beacons plus DTMF tone access so the beacons can be remotely switched on & off if necessary. The 23 cm beacon is being regularly heard in Melbourne. Any reports on these new beacons are most welcome to Colin at vk5dk@internode.on.net.

Towards the upper end of the spectrum, the VK3RWL Mt Warrnambool 10GHz beacon is being heard around Victoria and eastern SA. It is currently a little low in frequency on approximately 10368.430 MHz. The VK5VF 10 GHz beacon is currently off-air until further notice while some site issues are being dealt with. Wal VK6KZ reports that the VK6RST Albany 10 GHz beacon is alive and well, but several kHz higher than its nominal 10368.564 MHz. With the dish directed at VK5/3, it's hoped that one day the beacon may be heard across the Bight.

Finally, a reminder about the VK/ZL Logger Beacon Status page - http://vklogger.brizwebz.com.au/. Please don't forget to update the beacon information on that page if you become aware of any change.

6 m activity reports

Readers may have noticed a lack of reports on 6 m activity in this column. None of the current contributors isseriously active on this band, and so we hear very little news of 6 m happenings. To remedy this, I'm asking for a volunteer to contribute notes each month regarding 6 m. You don't have to have a degree in journalism or anything like that. It simply requires someone active on 6 m who is across the various sources of news and who can collate / summarise these into a short section for this column. Please help out and at the same time, foster more interest in your band. If you are interested, please contact me (VK3HZ) at the email address below.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital modes

Rex Moncur – VK7MO

Joe Taylor, K1JT, has released version 4.9.2 of WSJT, which provides for some 4 dB of improved sensitivity for JT65. It uses the existing transmission scheme and is thus compatible with older versions. The program achieves this improvement by using what Joe calls a "deep decoder" that digs further down into the noise. The "deep decoder" works by comparing a series of possible messages with the output of the receiver and working out a correlation factor. If it finds good correlation it prints out the message. The expected message can be from any of 4200 stations in the program's database who might be calling CQ, calling you, or sending you a report. It is also possible to put the program into sked mode where it looks only for the call sign of a station with whom you are in sked. One might feel this is pushing the boundaries too far as if you try long enough it is certainly possible to find a period of noise that corresponds to any given weak signal message. Of course every mode we use is subject to some error rate that we might hear an expected signal in the noise - the real question is whether the error rate is acceptable. To determine the error rate I conducted a test where the program was set up in sked mode to work a particular station at a marginal signal level. I then changed the message by just one letter in the call sign and in 6 hours of testing it did not once incorrectly give a decode of the expected sked message. In fact the error rate is less than 1 in 100,000 and thus the new decoder is extremely robust.

Welcome to Mark, VK2EME, who has joined the weekend activity meteor scatter activity sessions on FSK441 and has also been testing JT65. The activity sessions are held each Saturday and Sunday morning on 144.230 from 0700 to 0800 local Vic/NSW time. Southerly stations, VK3/5/7, transmit in the first 30 seconds of each minute and Northerly stations, VK1/2/4, in the second 30 seconds. FSK441A is used on Saturday and FSK441B on Sunday. After the sessions we have a callback on 7085 or nearby to share experiences. Newcomers are welcome and even if you are not yet operational on the digital modes please call in on 7085 and someone will be ready to help with your questions.

Please send any Digital Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

For most of January, weather conditions were very fast moving and unstable, and thus tropospheric conditions were very poor for most of Australia.

A very interesting and (in Australia) rare 146 MHz Sporadic E opening occurred on the 10th of January. Just after 10 am, John VK4FNQ from Charters Towers, north Queensland made it into the Canberra 146.950 repeater on Mt Ginini. Lucky stations at the Canberra end were Rob VK1ZQR and Leigh VK2KRR who had the pleasure of speaking to John, who was coming into the repeater over a 1735 km path, virtually noise free.

Also making it into the Canberra repeater at the same time as VK4FNQ was Felix VK4FUQ at Ingham, north Queensland. Felix did not quite have as good a signal as John did but was still in there, albeit briefly, over his 1893 km path via Sporadic E to the repeater.

It was quite amazing to hear these guys from north Queensland coming into the Canberra repeater via Sporadic E like they were locals.

John VK4FNQ also managed to get a few words into the Wagga repeater 146.750, but the path just wasn't there for him at that time.

On the 24th of January, conditions were very good around the south coast of VK3 and into VK7. Charles VK5XCP in Mt Gambier worked across to Gippsland to make contact with Peter VK3NPI (490 km). Charles had a full-scale signal on 2 m and a 5/9 on 70 cm simplex from Peter. Karl VK7HDX made it to the Otway Ranges repeater VK3ROW.

On the 30th of January, Brian VK5UBC at Corny Point was able to make it to the Mt Macedon repeater VK3RMM and contact John VK3HJW. This was 725 km for Brian.

Mike VK4MIK advises that it's been very quiet along the VK4 coast. But on the 31st he was able to make the 451 km distance to the Hayman Island repeater where he worked David VK4DJC. Mike also worked Mark VK4KMR via Hodgson Range, VK4RHR.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@bigpond.com.

ar

Microwave UpDate (MUD) 2005 call for papers

MUD 2005 will be held this year in the Los Angeles area on October 27 to 31.

As the Technical Program Chairman this year, I would like to invite interested authors to present a paper(s) for the 2005 conference.

Microwave Update is the premiere microwave amateur radio conference on the planet. Many people around the world collect the proceedings from this conference since it represents the current state of the art in microwave amateur radio. This is a great opportunity to get your ideas and papers published! You don't have to give a talk to get your paper included in the proceedings.

Electronic submissions in Word, WordPerfect or text format accepted by email or CD. Usual drawing formats also accepted with your paper(s).

Cutoff date for inclusion in the proceedings is September 5th, 2005.

If you are interested in writing and/or presenting a paper for the 2005 Conference, please send me an email or write to:

N6CA
PO Box 35
Lomita CA 90717-0035
email: n6ca@ham-radio.com

Please contact me as soon as possible with an abstract or even a general idea. This will help the conference team with its planning activities.

For more information about the Microwave UpDate 2005 see:

http://www.microwaveupdate.org

73 Chip N6CA

Gippstech 2005

Announcement

The WIA Eastern Zone Amateur Radio Club (Inc) is pleased to announce GippsTech2005.

This year the event will be held on Saturday July 9 and Sunday July 10. This event has a well-recognised reputation as the premier technical conference in VK considering techniques applicable in the VHF, UHF and microwave bands, especially for weak-signal contacts. In addition to the Conference, a Partner's Tour will be conducted, together with an informal social gathering for dinner on Friday and a Conference Dinner on Saturday.

CALL FOR PAPERS

Amateurs (& others with material to contribute) are invited to submit titles and outlines for topics to be presented at GippsTech2004. Presentation slots can be brief (5 -10 minutes) through to 1 hour. Anything longer - you will need to justify!!

Presentations can be formal or informal, or display. We use a lecture theatre for the formal (& semi-formal) presentations. Displays are open during coffee/tea breaks and after lunch. Potential presenters are welcome to contact me direct for further information or to suggest a topic.

The conference is held in Churchill about 170km east of Melbourne.

Further details can be found at the Eastern Zone Amateur Radio Club web site at:

http://www.qsl.net/vk3bez/

Peter VK3KAI
Chair, Organising Committee
vk3kai@qsl.net

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

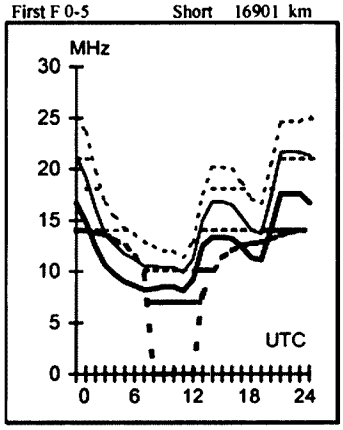
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

March 2005
T index: 30

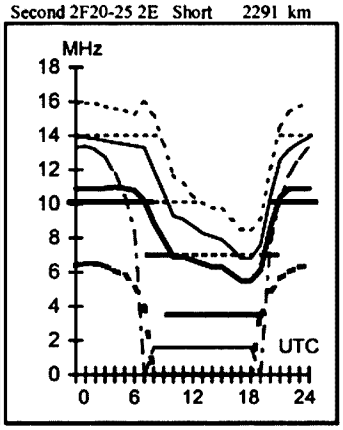
Legend

Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

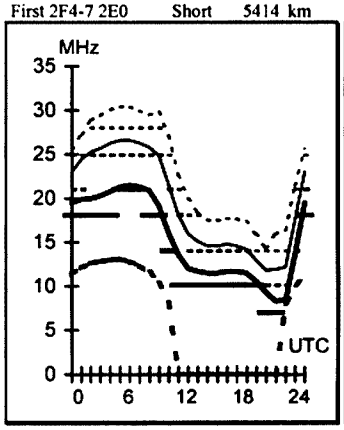
Adelaide-Ottawa 68
First F 0-5 Short 16901 km



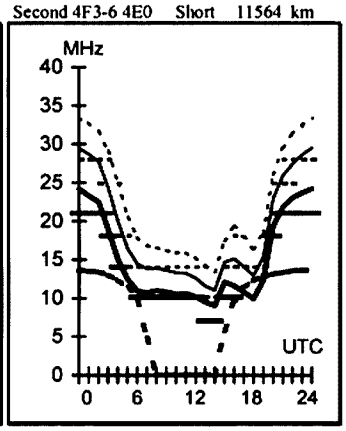
Brisbane-Auckland 123
Second 2F20-25 2E Short 2291 km



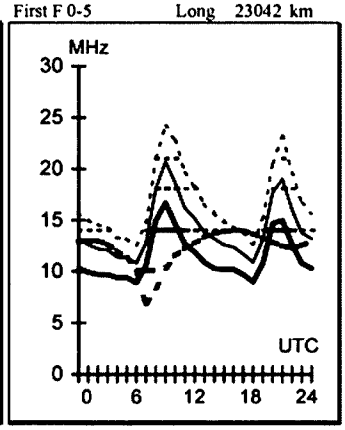
Adelaide-Singapore 311
First 2F4-7 2E0 Short 5414 km



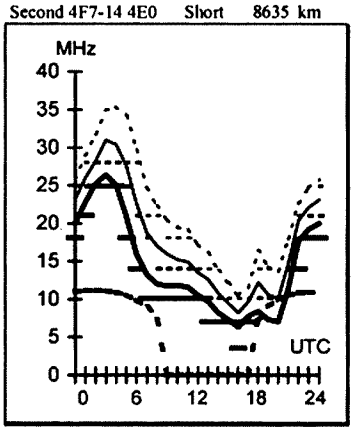
Brisbane-Los Angeles 59
Second 4F3-6 4E0 Short 11564 km



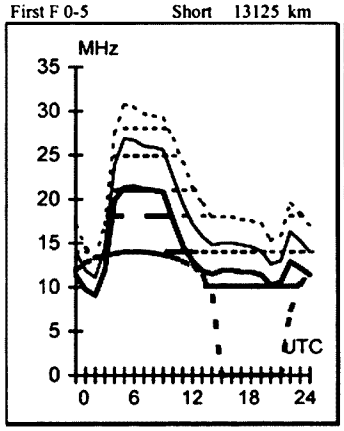
Canberra-London 136
First F 0-5 Long 23042 km



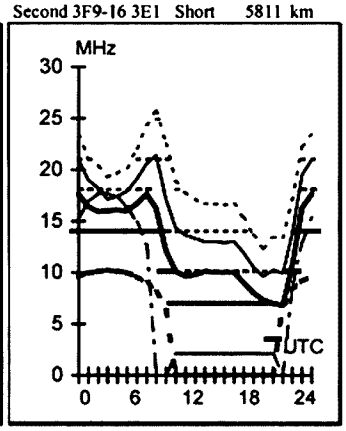
Darwin-Honolulu 65
Second 4F7-14 4E0 Short 8635 km



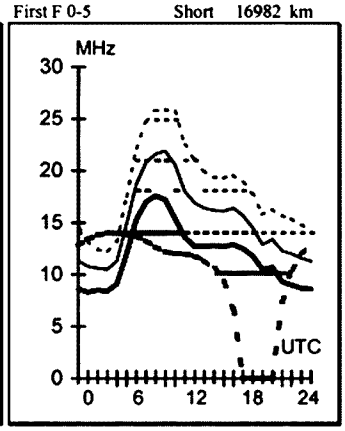
Adelaide-Tel Aviv 291
First F 0-5 Short 13125 km



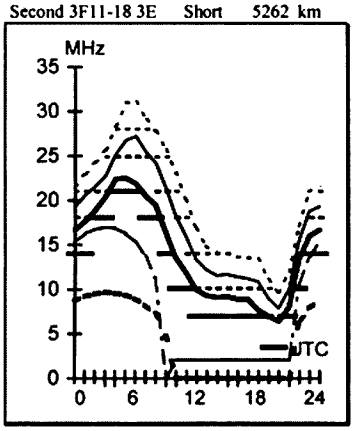
Brisbane-Manila 320
Second 3F9-16 3E1 Short 5811 km



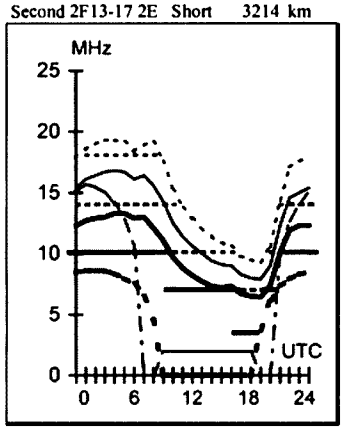
Canberra-London 316
First F 0-5 Short 16982 km



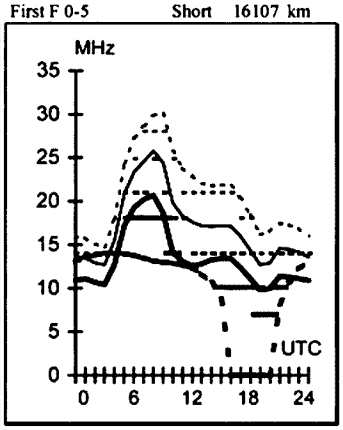
Darwin-Osaka 5
Second 3F11-18 3E Short 5262 km



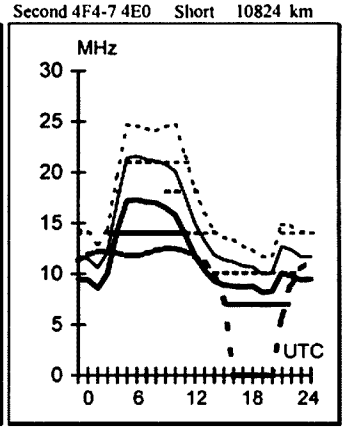
Adelaide-Wellington 114
Second 2F13-17 2E Short 3214 km



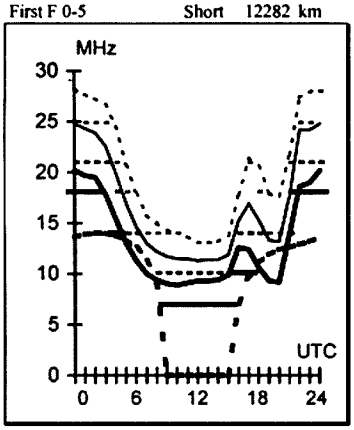
Brisbane-Rome 305
First F 0-5 Short 16107 km



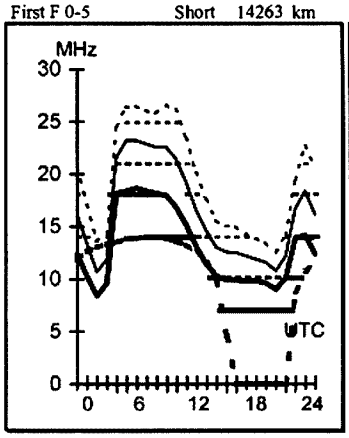
Canberra-Pretoria 231
Second 4F4-7 4E0 Short 10824 km



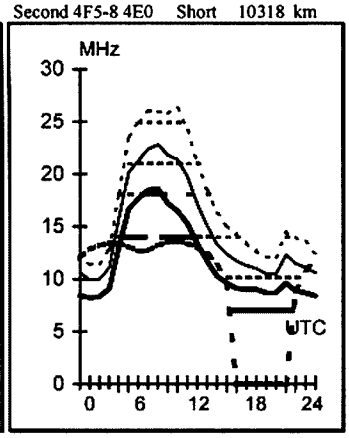
Darwin-Seattle 44
First F 0-5 Short 12282 km



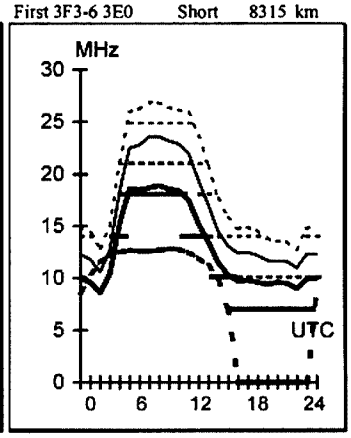
Hobart-Cairo 278
First F 0-5 Short 14263 km



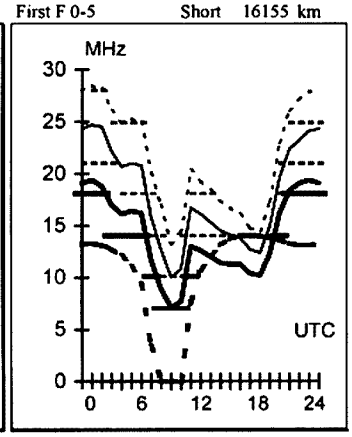
Melbourne-Capetown 222
Second 4F5-8 4E0 Short 10318 km



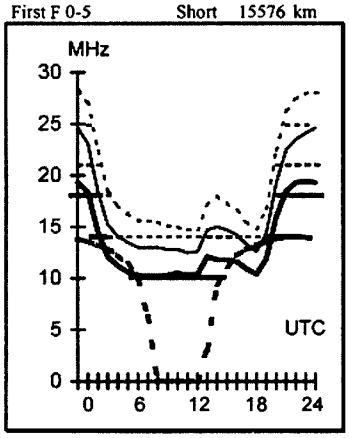
Perth-Johannesburg 248
First 3F3-6 3E0 Short 8315 km



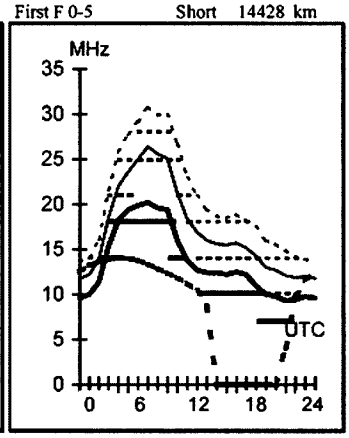
Sydney-Barbados 119
First F 0-5 Short 16155 km



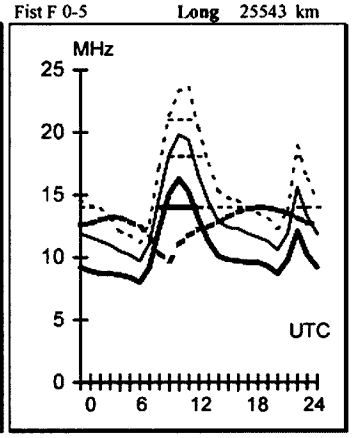
Hobart-Chicago 72
First F 0-5 Short 15576 km



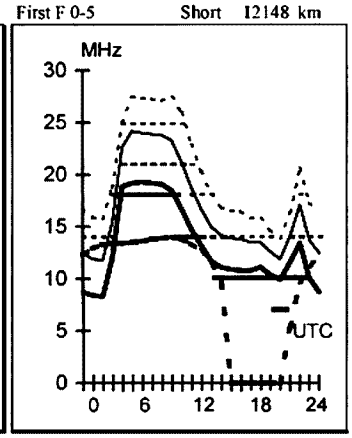
Melbourne-Moscow 316
First F 0-5 Short 14428 km



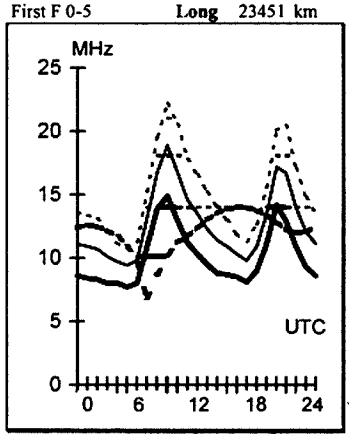
Perth-London 133
Fist F 0-5 Long 25543 km



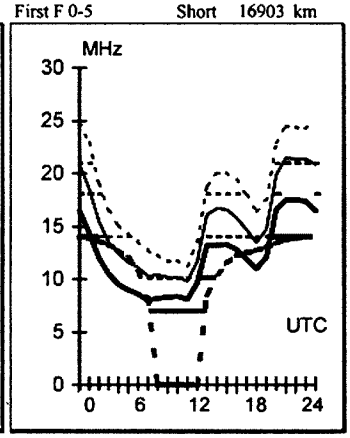
Sydney-Nairobi 255
First F 0-5 Short 12148 km



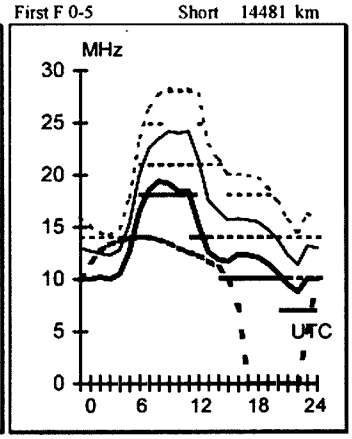
Hobart-Oso 138
First F 0-5 Long 23451 km



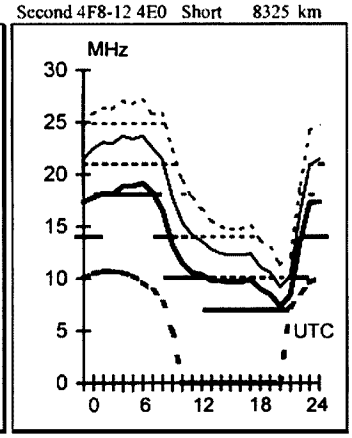
Melbourne-Montreal 60
First F 0-5 Short 16903 km



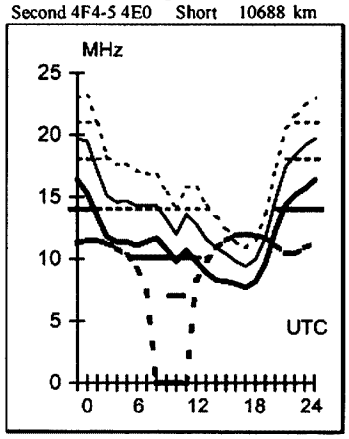
Perth-London 313
First F 0-5 Short 14481 km



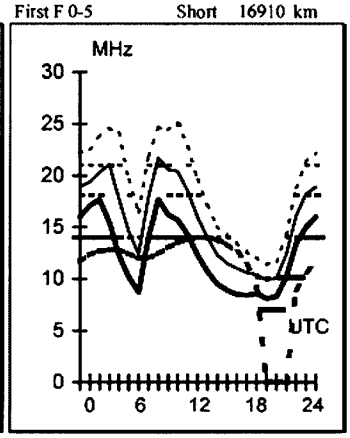
Sydney-Seoul 340
Second 4F8-12 4E0 Short 8325 km



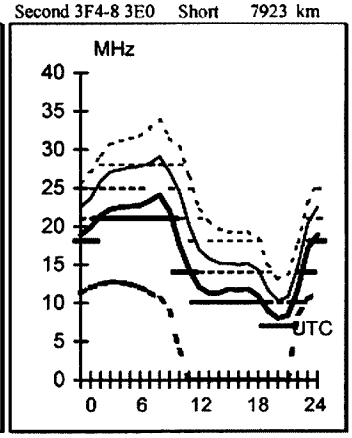
Hobart-Santiago 149
Second 4F4-5 4E0 Short 10688 km



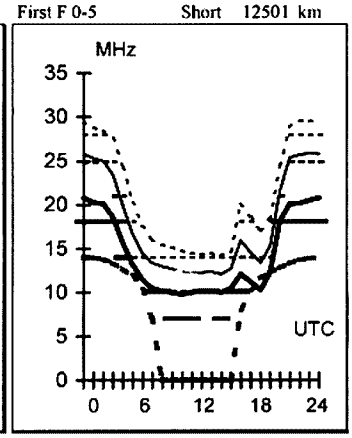
Melbourne-Senegal 219
First F 0-5 Short 16910 km



Perth-Tokyo 20
Second 3F4-8 3E0 Short 7923 km



Sydney-Vancouver 45
First F 0-5 Short 12501 km



Hamads *classifieds* FREE

FOR SALE ACT

Operating and Service manuals for Philips VHF Base Station Model FM-814, and, Philips UHF Base Station Model FM-815 MK3. Each $25.00 plus postage. Peter VK1CPK QTHR Phone 02 6231 1790.

WANTED ACT

Operating and Service Manuals for AWA Television Calibrator Model A56057 and Television Sweep generator Model 4A56036. All costs refunded. Peter VK1CPK QTHR Phone 02 6231 1790 FAX. 02 6296 5712.

FOR SALE NSW

MAKE AN OFFER: Sattrak 111 tracking controller for 12 satellites, G3RUH 400 baud PSK Mk11 TLM decoder, 60cm alu dish c/w 2.4 GHz/144 MHz down converter, Mode J 144 MHz filter, YAESU G-5400B az/el antenna controller c/w 11 foot length 3 section boom, VARIAC 240 volt heavy duty, DSE 75mm LAB oscilloscope model Q-1280, DSE 40V/3A LAB power supply (new), BENDIX BC-221 AK 125kHz-20MHz frequency meter, 500 volt MEGGER (insulation tester), ***TYPE N LDF4-50 right angle HELIAX connectors (2), TYPE N PLUGS*** for half inch flexible FSJ4-50B HELIAX (6), Homebrew copy Kenwood 13.8V c/w overload protection. Art VK2AS QTHR Phone 02 9416 7784.

4 x Mobile Helicals, 10, 20, 40, 80 m, 2 spring mounts, 1 long 20 m helical, 2 gutter grips; $120 total. Panasonic KX-P1180 Printer, $10; 2 x FM-828A, $20 ea; 2 x FM9-2A plus 4 control heads, $80 total; 4 x LDF4-50 female N connectors, new, $15 ea; 8 metres LDF 5-50 coax, $20; 6.5 metres LDF 4-50 coax, $10; Roger Woodward VK2DNX, Rogerwoodward10@hotmail.com, Phone 02 9547 2546

WANTED NSW

Yaesu FT-757GX II instruction manual. Will gladly pay $25 plus postage for photocopy. Jack VK2AEW QTHR. Phone 02 4344 7191.

Kenwood TS-520S in good working order. Keith VK2AY QTHR Phone 02 6368 4304.

WANTED VIC

HRO receiver. Has anyone out there an HRO in complete condition that they would sell? Prefer 5T or Senior model, but anything considered. Bill VK3HX QTHR. Phone 03 9807 9172.

R-1155, CR-100, B-40D 64 - 30 m, FT-7B, FT-707. Audio amp for TK60, AR88HF, BC-348 notes, BC-342 notes, Hammarlund HQ-120X, field intensity meter type WX-A, serial no 539 made by Rea USA. Fred Jackson Phone 03 9376 3076.

4-125A or QB3-300 Tetrode tubes, condition and price to Ray VK3RD Phone 03 9726 9222 or 0409 408 145.

DSE R.F Aerospace Sat 7018GR Yagi Antenna Cat No D-4701. Contact VK3UCM Phone 03 9730 1619.

Kenwood SP-930 or SP-180 speaker in good condition & GWO Damien VK3RX Phone 03 5427 3121 vk3rx@wia.org.au

WANTED QLD

Icom IC-765 transceiver in good working condition. Please indicate serial no. or age, eventual options fitted and cosmetic condition (mint/very good/good/used look) and whether original shipping boxes and manuals are still available. Ron Vette VK4QM QTHR, rhvette@keypoint.com.au, Phone 07 5488 0268.

60 to 80 foot Southern Cross Aerial Communication Tower. Preferably with tilt over feet. Can dismantle if located within approximately 200 km of Brisbane. Contact David VK4DH, Phone work 07 3842 7727, home 07 4664 1105, mob 0417 282 270, email david.holton@landmark.com.au

MISCELLANEOUS

• **The WIA QSL Collection requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

TRADE ADS

PSK-31, SSTV, RTTY SOUNDBOARD Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

RADIO SPECIALISTS sales and servicing. Buying radios. Shop: 243 Seacombe Road, South Brighton (Adelaide) 08 8298 3906

email:rfwizard@optusnet.com.au for prices.

NOTE:I do NOT import radios from the USA. Can you afford to write a radio off? VK5VK

About hamads....

- Hamads may be submitted by email or on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newunltd@bigpond.net.au* **Fax:** *03 9756 7031*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

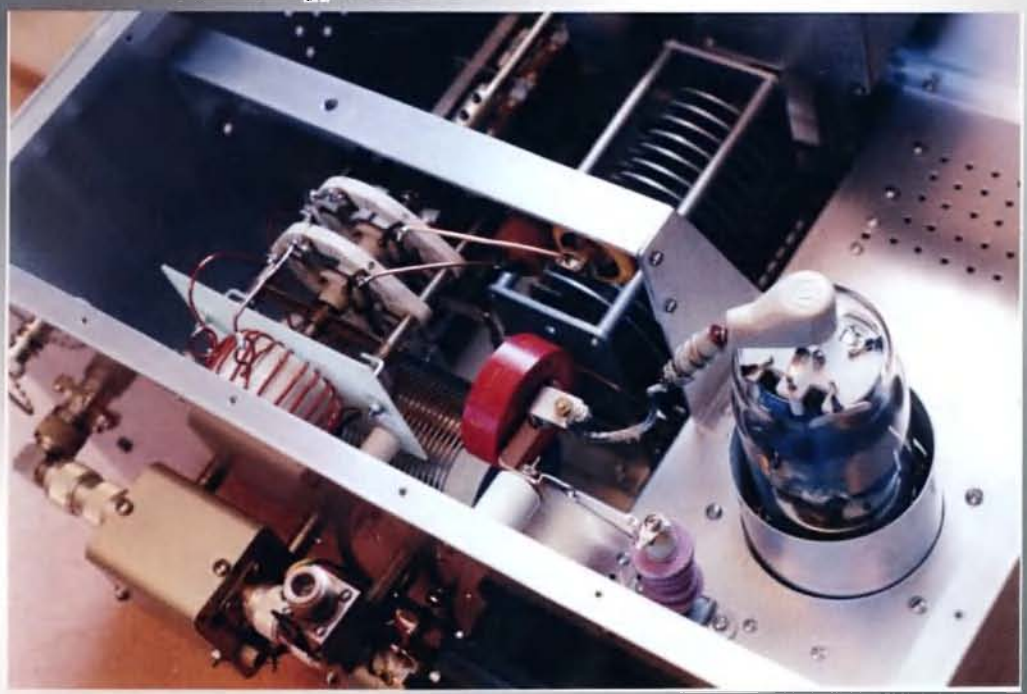
VICTORIAN CONSUMER AFFAIRS ACT
All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

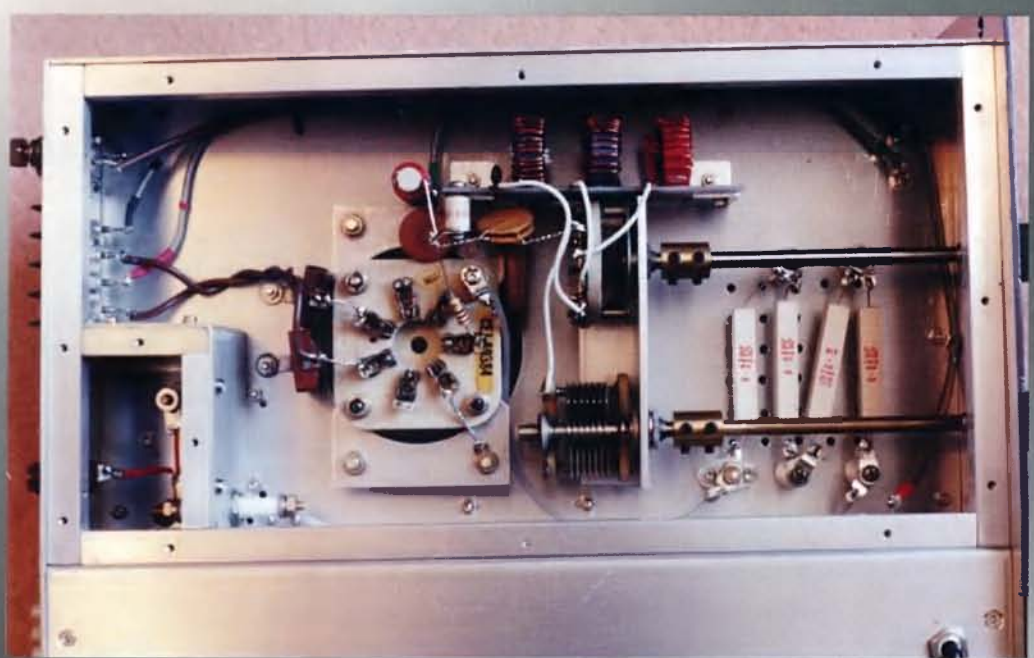
ADVERTISERS INDEX

AEI 15
Benelec ..... IFC
Bushcomm 16
Com-an-tena 23
www.vk3ajj.com 56
TET-Emtron 9
G & C 8
Icom ..... 16, OBC
Ozgear 17
TTS 27
54s 55
VK Discounts 55

HOMEBREW *is alive and well*

The beautifully crafted three-band AM transmitter designed, built and operated by Roy VK3ARY features a solid-state driver/exciter, and a single 813 power amplifier modulated by a pair of 807s in class B zero bias. It sounds as good as it looks. Roy is a regular participant in the "Coffee-break" AM net Monday to Saturday, 11.00 am to noon on 1843 kHz.





Photos – Drew Diamond VK3XU

ICOM'S GREAT CHAMPIONS

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706.

Now includes 70cm @ 20W and 50W on 2m
Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch Detachable Front Panel (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied:HM133.

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM
Wideband receive 495 KHz - 1 GHz
555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

ICOM

PH416_AM02

AIRBAND | AMATEUR LAND MOBILE MARINE RECEIVER UHF CB

find your nearest ICOM dealer at

www.icom.net.au or (03) 9387 0666

Volume 73 No 4
April 2005

Amateur Radio

$6.50
incl GST

The magazine for
AUSTRALIAN radio amateurs

A new generation gets the bug!

ANTENNAS

Unravelling the mysteries of connecting radios to antennas
Brian Clarke VK2GCE

A pi-coupler for the compact 160 m vertical (and HF antennas)
Drew Diamond VK3XU

More information on the VK5BR_X3 antenna
Lloyd Butler VK5BR

Yet another RF bridge
Dale Hughes VK2DSH

A primer on power line carrier systems
Barry White VK2AAB

9 770002 685048 04

BENELEC

YAESU

You Get A 3 Year Parts & Labour Warranty On All Radios Supplied By Benelec No Matter Where You Buy It.

All Other Radios On The Market Are Not Covered By This Warranty

Look For This Label

Your Seal of Confidence

Can You Be Sure You Will Be Able To Get Spare Parts or Have Your Radio Repaired If Something Goes Wrong?

Don't Take A Chance!

www.benelec.com.au

Authorised Yaesu Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosound.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
sales@strictlyham.com.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8342 4700
brenton@posnav.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

Amateur Radio

Volume 73, Number 4
April 2005

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Lightning protection 24
Kev Peacock VK4VKD
Calling CQ CQ, ... 27
Karsten (Kas) Thole VK5ZK
SSETI Express update 39
Graham Shirville G3VZV
Pounding Brass in the jungle 50
Herman Willemsen VK2IXV

TECHNICAL

Yet another RF bridge 5
Dale Hughes VK2DSH
Unravelling the mysteries of connecting radios to antennas. Part 1. 10
Brian Clarke VK2GCE
A pi-coupler for the compact 160 m vertical (and HF antennas) 14
Drew Diamond VK3XU,
More information on the VK5BR_X3 antenna 18
Lloyd Butler VK5BR
A primer on power line carrier systems 21
Barry White VK2AAB
Surface mount test tweezers (Technical abstracts) 23
Peter Gibson VK3AZL
Improvements to the 2 metre copper loop (Technical abstracts) 36
Peter Gibson VK3AZL

COLUMNS

ALARA 37
AMSAT 38
Contests 41
Directory 56
Editorial comment 2
Hamads 54
HF predictions 52
Over to you 45
Spotlight on SWLing 45
Technical Abstracts 23, 36

News from...
VK2 30
VK3 32
VK4 32
VK5 33
VK6 34
VK7 35
VHF/UHF – an expanding world 47
WIA comment 3
WIA news 4

Our Cover this month

Karsten Thole VK5ZKT in his shack. Karsten is one of a younger group of amateurs who got the bug early, listened to CB, Short Wave broadcasting and amateurs. First licenced as VK5HKT he continued his studies at TAFE to get a Certificate III of Electronic Engineering (RF Communications) which provided him with further employment oportunities and also exemption from the full call theory section of the Amateur licensing requirements. People like Karsten need all the encouragement we can give them both before they get their licences and once they get on the air. Now read his article on page 27.

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

June Fox	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
Education	Ron Smith	VK4AGS
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
FTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	t.b.a.	
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glen Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

The changing voice of radio etiquette

Hi members and readers,

We all have an interest in amateur radio and we should all work hard to present the best image possible of our great hobby.

We need to remember always that everything we say on air is said on an open frequency and anyone can listen. Every now and then someone does something which annoys us and we feel we have to let our friends know about it. However doing this on air creates a very bad impression of what amateurs are. In my experience "having a go" at someone without first checking the facts is not very helpful. It is much better to have a chat about the matter and then make a decision about whether you can each have an opinion. The world will not end if a counter view is held.

Some times someone else needs to act as arbitrator when things could get out of hand. We really need to read the Amateur Code in the ARRL Handbook and use that as a guide to how we treat our hobby, our fellow amateurs and ourselves. One area where we will have to think carefully, is how we treat our fellow amateurs when the Foundation licence brings a completely different group of people to join our ranks on the air. We will need to remember they need guidance and assistance to be shown what "in depth" amateur radio is and maybe corrected in how they are using their equipment and the RF spectrum. We also need to remember times have changed eg ICW is not the only mode we can use these days.

I had a good amateur month in March. Got most of the gear working and went out in the field with my VHF transceivers and the "cheap portable generator" worked flawlessly. As did VK5AIM's. I also noted that Summerland ARC used at least one of these and they were equally impressed. I have still to perfect sleeping arrangements in the Beetle. Without the backs for the back seat and the passenger seat there is plenty of room down the passenger side, you just have to get it padded where your hip bone is !!!!

I am publishing two letters this month, one from Col Harvey VK1AU trying to trace all amateurs who were killed in WWII, as he feels our present information is still inaccurate. The second a request for AR to publish a directory once or twice a year of suppliers of components. Gone are the days when components and kits were a major proportion of the stock in the local DS store. I wonder if someone in each major centre would be willing to collect the local information and send it to me. Better still would someone coordinate the information and present me with a final collation.

Enough for now. Have a great activity month in April, work the Harry Angel Sprint and otherwise enjoy your hobby.

73 Colwyn VK5UE

Wireless Institute of Australia

2005 Annual General Meeting

7 May 2005

Michael Owen VK3KI

Assessment of competency in amateur radio

In the December 2004 issue of "Amateur Radio", under the heading "A better qualification system" I wrote about the possibility of replacing the present system of Group Leaders, Invigilators and Examiners with a system of accredited assessors.

I pointed out that a competency-based training approach has been adopted in Australia, and is the basis of the nationally recognised qualifications based on the Australian Qualifications Framework. I said that we were considering a system whereby WIA assessors are formally trained by a Registered Training Organisation (RTO), and accredited and registered by the WIA.

An audit procedure would be established and all assessors would be subject to audit. Assessor registration would last for a period of three years, after or during which time the assessor would be reviewed and where appropriate re-registered by the WIA.

I thought it important that the adoption of such a system would mean that the candidate could learn immediately whether he/she is competent or is not yet competent, and importantly, that the assessor would be able to explain the decision and be able to tell the candidate what he/she needs to do to become competent.

I asked for your opinion. At that time I had only raised the idea with one group.

Since then I have met with a number of clubs, including a group of representatives of clubs in Adelaide, and clubs as far away from Melbourne as Alice Springs and Darwin.

At each meeting I have raised the issue of accreditation, very much in the context of the fact that it would involve in time at least a full weekend to qualify.

I certainly do now have a very clear view of the opinion of many people, particularly of those from the clubs involved in the present WIA Examination System.

There is a general view that the present system can be very negative. It can be far too long before the candidates know whether they have qualified. And even then, no real guidance as to the areas where more work is needed is necessarily readily available. Most involved in the present system feel that immediate and constructive guidance designed to encourage achievement of the required standard would be highly desirable, particularly when the objective of all of us must be to encourage more people to become amateurs.

In short, everyone I have spoken to involved in the current system believes that what we have at present can be substantially improved. And everyone is prepared to give the full weekend necessary to achieve accreditation.

I have been really encouraged by that response.

It also makes me confident about the successful introduction of the Foundation Licence, with practical assessment a requirement of qualification.

So, what is the next step?

The WIA, in one sense, faces a dilemma. As we know from the ACA's "Outcomes of the Review of Amateur Service Regulation", May 2004, the ACA has decided to proceed with the outsourcing of certain functions, including the management of examinations, which is currently delegated to the WIA. These functions can be expected to be subject to competitive tender.

So, without giving too much away, the WIA, with the network of clubs being one of its strengths in providing examination facilities across the country, could rely on the proposed accreditation of assessors as part of its tender.

On the other hand, there is no certainty as to when the new Foundation Licence will come into force, and the WIA's specialist group is still developing the syllabi for all three levels of licence, but perhaps around May or June may be realistic.

I certainly know that there are many clubs and individuals in the clubs anxious to move ahead with encouraging potential Foundation Licensees to qualify.

It would hardly be right for the WIA to place any impediment in the path of those wishing to move ahead. And doing nothing to preserve some sort of perceived advantage over any potential but presently unidentified competitor hardly seems the way that the WIA should behave. After all, the WIA exists to protect and promote amateur radio.

But how will the Foundation Licence candidates be assessed? I don't think we can keep the means by which we propose to make the whole amateur qualification system more attractive secret.

But what if we all take the time and spend the money, and then the ACA says, no, it wants some sort of different system?

That is the risk that we are prepared to run. Simply because we believe that the Authority must have proper regard to the WIA's non-commercial duty to amateurs and to amateur radio.

The WIA is prepared to work on the basis that the ACA will accept the WIA's proposal for accredited assessors, and to move ahead with establishing the means of accreditation.

As I said in the December article, assessor accreditation is achieved through a Registered Training Organisation, an RTO. The WIA plans to offer to clubs the opportunity for at least one and perhaps two of their members currently involved in the examination system to become accredited at courses conducted by an RTO, probably in Brisbane, Sydney, Melbourne and Adelaide.

This will involve the cost of travel and accommodation for those not living close to those cities.

Currently, we are exploring how this can all be achieved. We would hope that the clubs will be able to provide some funding, perhaps with some contributing more than others. Perhaps the WIA itself can make some contribution. It certainly will meet the costs associated with providing the course.

We know, only too well, how far from those four cities many clubs, that are an essential part of the WIA Examination System are.

I hope that we shall be able to announce dates and venues soon, with plenty of notice for those we hope will attend.

But do understand that the WIA will do all it can to facilitate the early and successful introduction of the Foundation Licence.

ar

WIA news

President visits Alice Springs and Darwin radio clubs

WIA President, Michael Owen, VK3KI, visited the Alice Springs Amateur Radio Club on 4 March, joining a group for a most interesting and useful dinner discussion.

The following Monday evening saw Michael talking to about 25 members of the Darwin Amateur Radio Club at their rooms in Fanny Bay.

At both meetings Michael spoke about the development of the WIA, and the progress with the changes to the structure of amateur licensing, particularly the Foundation Licence, and the need for clubs to be ready to promote that licence.

At both meetings discussion included the WIA proposal for the accreditation of assessors, particularly the distance of both clubs from the centres where courses could be conducted.

Australia proposes table allocation to amateur at 135.7-137.8 kHz

Item 1.15 of the agenda for the next ITU World Radiocommunication Conference in 2007 ("WRC-07") is "to consider a secondary allocation to the amateur service in the frequency band 135.7-137.8 kHz".

Currently the only proposal to satisfy agenda item 1.15 is the entry of a footnote. At the recent Asia-Pacific Telecommunity Conference Preparatory Group for WRC-2007 held in Bangkok, Thailand, between 28 February and 3 March 2005 Australia proposed as a second method of satisfying the agenda item, an allocation to the Table, rather than a footnote.

That proposal received support, and now Australia will move to forward the position it suggests to the relevant ITU Study Groups Working Party. The Australian paper is available on the WIA web site.

IARU Region 3 participates in APT Conference

IARU Region 3 was represented at the Asia-Pacific Telecommunity Conference Preparatory Group for WRC-2007 held in Bangkok, Thailand, between 28 February and 3 March 2005 by Region 3 Chairman, YS Park, HL1IFM and David Wardlaw, VK3ADW.

The meeting was attended by 25 Member administrations with 161 delegates and 29 Affiliate members with 61 observers and 8 international organizations with 27 observers.

IARU Region 3 submitted a paper "The Better Utilization of the Amateur Radio Service as a Resource for Disaster Communications". The paper draws attention to the role of amateurs in the recent Tsunami disaster and also to the changes made to the international regulation governing the amateur service at the last ITU WRC. These changes enhance the opportunity to use the amateur service in such situations. The paper stresses the need for national regulations not to inhibit preparation for and participation in disaster support. A copy of the paper may be found on the WIA web site.

WIA Director in follow-up interview on Melbourne radio

WIA Director Robert Broomhead was a guest on Monday 14 March on Melbourne's 3WBC FM weekly Tech Talk Radio program. This was a follow up to an original interview that took place on 24th January.

Work starts on 2006 Callbook

The call book production team needs your help. They ask all contributors who supply non call sign information to look at any amendments that may be required to information published in the 2005 issue.

Any corrections to the actual call sign information should be submitted to the ACA before June 30, 2005.

The team would be happy to receive high quality photographs that may be suitable for the front cover.

Please email information to callbook@wia.org.au or post to Callbook, PO Box 2175, Caulfield Junction, Victoria 3161.

Melbourne's EMDRC White Elephant Sale

Melbourne's Eastern & Mountains District Radio Club (EMDRC) White Elephant Sale was held on Sunday, March 6. The White Elephant Sale (or WES) is one of VK3's biggest hamfests, with this year's event being no exception seeing amateurs travelling from all over Victoria to be part of this special day.

The national WIA was once again in attendance with its new corporate stand proudly showing its range of updated promotional material and new WIA merchandise.

This is the second appearance for the new WIA stand, the first appearance being at last month's Wyong Field Day. Vice President Ewan McLeod along with Director Rob Broomhead were in attendance and were ably assisted by Emma Trebilco from the WIA office.

"WIA membership was being promoted and we had such an encouraging response with no fewer than ten people joining the WIA as first time members and countless others who took the opportunity to renew their existing membership. It was a great day and a fantastic opportunity for Ewan, Emma and me to meet and have a chat with our local troops. We have really appreciated the overwhelming support and many kind words of encouragement for the work being done" Robert said.

Australian optical communications record broken in Tasmania

Mike, VK7MJ on Mt Wellington and Chris Long on South Barrow have set a new Australian record for full duplex optical communication over a path of 167.7km using voice.

The contact occurred between 1100 and 1200 UTC on Saturday, February 19, 2005. Two way full duplex voice communication was established at 475 TERAHERTZ (that's right - visible light), over a distance of 167.7km between stations on the summits of Mount Wellington near Hobart and South Barrow, near Launceston Tasmania.

The Worlds First IRLP Contest

The Bass IRLP Group located in Melbourne HYPERLINK in conjunction with the Chesapeake AR Club in the USA HYPERLINK has organised the world's first IRLP Contest.

The contest commenced on March 18, 2005 and runs through until the April 17, 2005. The prize for this contest is a very nice trophy, donated by Marine Computer Technology, Queensland. The competition, whilst titled the "1st Annual Aussie-American International IRLP Contest" is open to any amateur in any country, so long as an IRLP node can be accessed to participate.

ar

Yet another RF bridge

Dale Hughes VK2DSH

There have been many designs for radio frequency impedance bridges published, and each design offers various features and frequency coverage. Some designs have the ability to measure resistance and reactance, while others measure only resistance. For antenna measurements the main requirement is the ability to measure resistance as some indication of reactance can be gained by varying the frequency and observing if the frequency is above or below resonance. If there is the need to measure the input impedance of amplifiers or other types of networks, the ability to measure reactance and resistance is useful.

Bridges designed for frequencies above a few Megahertz can have problems with stray capacitance and inductance. These effects have the potential to increase measurement uncertainty if care is not taken in the construction and use of the instrument. For transformer coupled bridges, reference (1) gives a comprehensive analysis of the sources of measurement uncertainty and how they can be minimised. The main factors are the use of a well balanced coupling transformer and the addition of a small inductor in the $Z_{unknown}$ side of the bridge to compensate for stray inductance in the reference side of the bridge. This design uses those techniques.

My need was for a bridge that was useable over the range of 3 to 40 MHz and which used either an internal noise source, or an external source of bridge excitation. This design allows a receiver or an in-built RF voltmeter to be used as a null detector. The user can configure the bridge according to his or her need by using a short coaxial cable. This unit was built to measure resistances over the range of 10 to 200 Ω in parallel with capacitance between ± 200 pF. The more familiar series impedance can be calculated and expressed in the form of:-

$$Z = R \pm jX$$

where $j = \sqrt{-1}$

by using equations given later. I have found the instrument useful for measuring the input impedance of amplifiers and mixers when developing receivers and transmitters; it is also useful for measuring the impedance of antennae so that they can be tuned to a given frequency.

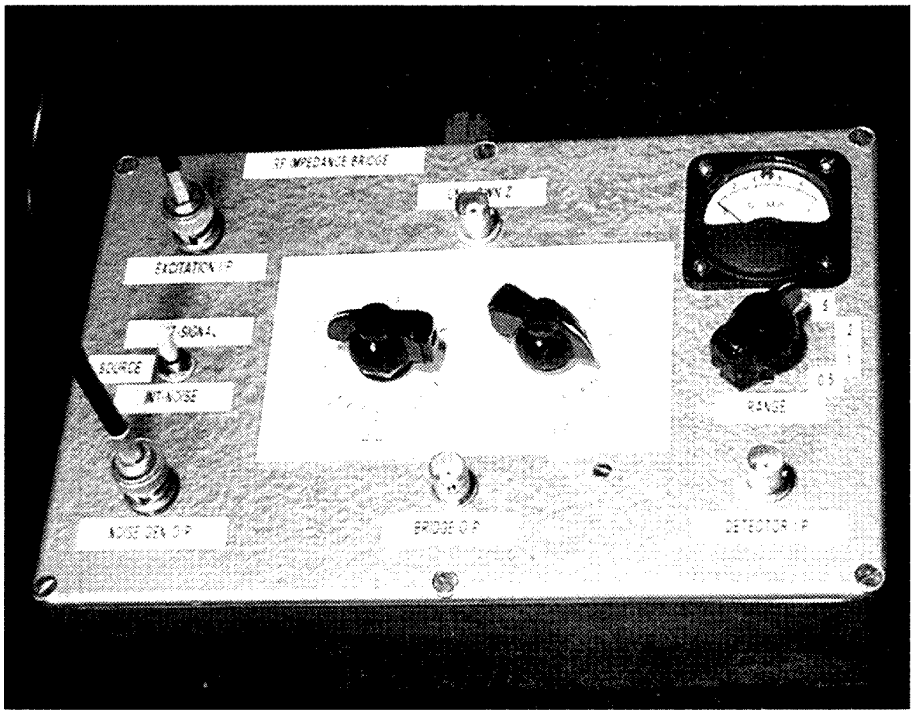


Figure 1: The RF impedance bridge configured to use the internal noise generator for bridge excitation.

Circuit description

The complete unit is made up of three sub-sections:

1. The bridge is variation of the well known Wheatstone bridge, in a configuration known as a 'hybrid coil' or 'transformer-ratio-arm' bridge. Transformer, T1, splits the excitation signal into two parts. One part feeds the unknown impedance that is connected to X3 ($Z_{unknown}$), the other part of the excitation signal feeds the reference resistor and capacitor (R1 & C1) which are adjusted to match the impedance connected to the X3. When the impedances on both sides of the secondary of T1 are equal, the signal at X2 falls to a very small value and the detecting device indicates a null condition. Connector X3 has a 200 pF capacitor in parallel, so the bridge will balance when variable capacitor on the reference side is also set to 200 pF ± $X_{unknown}$. If the unknown impedance has a reactive component, capacitance can be added or subtracted from the reference side to balance the bridge. If the unknown impedance is capacitive, the variable capacitance is increased until a null is detected. If the unknown impedance is inductive, the variable capacitance is decreased until a null is detected. Thus inductance can be measured by converting the decrease in capacitance ('negative capacitance') to an equivalent inductive reactive. Inductor L1 is used to compensate for stray inductance on the reference side of the bridge and it is critical in reducing measurement uncertainty at higher frequencies. How to adjust L1 is covered in a later section.
2. A source of excitation is provided by a wide band noise generator. A Zener diode is used as the

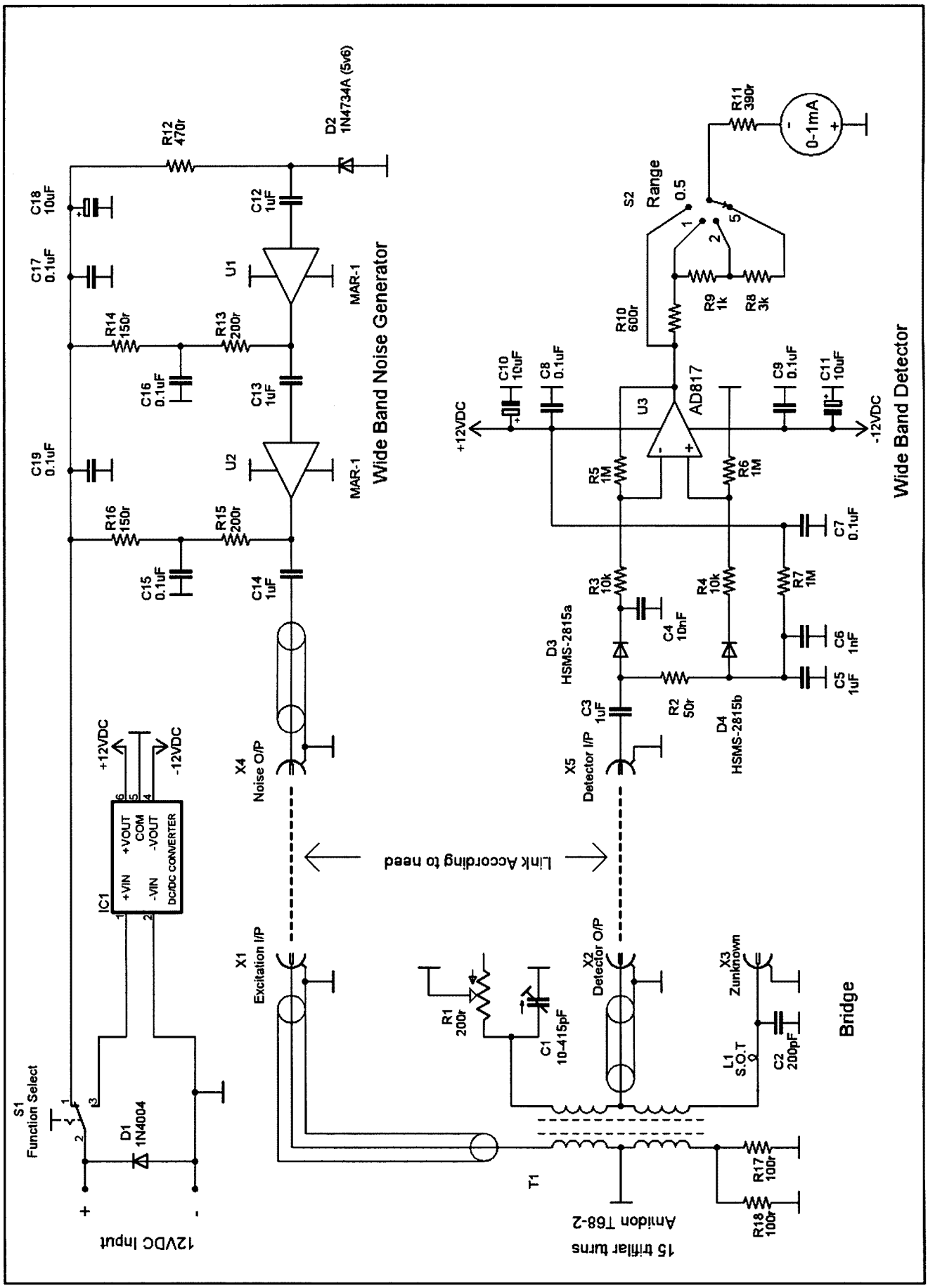


Figure 2: Schematic diagram of the radio frequency impedance bridge.

noise source and the noise signal is amplified by a pair of MAR-1 amplifiers. The two amplifiers have a combined gain of approximately 36 db and the noise output is more than adequate for the task. Other types of amplifiers could be used if they are more readily available. The noise source supplies bridge excitation when it is used in the 'noise bridge' mode. In this case the detector needs to be a receiver or other frequency selective device. (Note: the noise generator output extends to approximately1 GHz and can be used as a signal source for testing VHF and UHF receivers.)

3. A sensitive null indicator is provided by diodes D3 and D4. Their output is amplified by U3 and the detected voltage is used to drive a meter through a range switch. The detector circuit is useful when the bridge is excited by a signal generator or other source of sine wave excitation. The detector circuit is very sensitive as the diodes are forward biased; thus, only a few tens of millivolts are needed to excite the bridge. Two diodes are used in a differential mode so that temperature drift is cancelled out, giving a very stable output.

Note: No usable null can be detected if the in-built noise source is used to excite the bridge when the diode detector is used. This is because the bridge will only balance at one frequency for any given impedance and a wide band noise source contains many frequencies instead of just one. This same problem can occur if an external source of excitation is used and it does not have a high degree of spectral purity. Measurement problems will occur if the sine wave excitation is distorted, thus containing harmonics that will not balance out.

Construction

My unit is built into a die-cast box. Most of the circuitry is assembled on the underside of the box lid, with all connections made as direct as possible. The noise generator is mounted on the inside base of the box and is connected by a short length of RG-174 coaxial cable to the front panel connector. None of the components is especially critical; although the reference potentiometer must be a carbon composition type, the wire wound type have too much self-inductance to be useful.

Conversion between series and parallel components

The usefulness of this bridge is enhanced if the user has knowledge of how to convert between equivalent series and parallel circuits. At any given frequency, a parallel combination of resistance and reactance can be converted to an exactly equivalent series combination (see Figure 3).

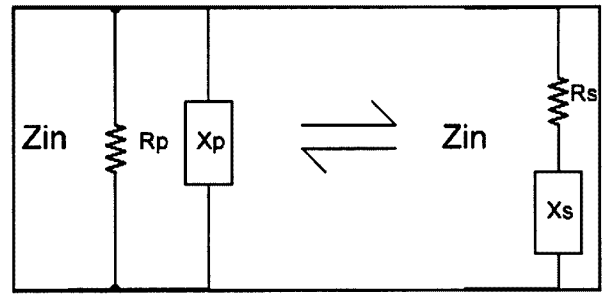


Figure 3: Parallel and series circuits.

The following equations link the two circuits:

$$R_P = \frac{R_S^2 + X_S^2}{R_S}$$

$$X_P = \frac{R_S^2 + X_S^2}{X_S}$$

$$R_S = \frac{R_P X_P^2}{R_P^2 + X_P^2}$$

$$X_S = \frac{R_P^2 X_P}{R_P^2 + X_P^2}$$

Where X is reactance given by:

for inductors: $X = 2\pi f L$

for capacitors: $X = \frac{1}{2\pi f C}$

An example of using these equations is given in the section that covers the calibration of the instrument.

Bridge calibration

The first step is to adjust L1, which compensates for stray inductance on the reference side of the bridge. In my bridge, L1 was a short length of wire approximately 2 cm long soldered between the $Z_{unknown}$ connector and transformer T1. The position of the connection to T1 on L1 is adjusted so that the inductance on both sides of the bridge is the same (see Figure 4).

The procedure is as follows: Connect a low inductance 50Ω resistor to X3 ($Z_{unknown}$) and balance the bridge at the lowest possible frequency. Record the setting of the reference resistor and capacitor. Repeat the process at the highest possible frequency while adjusting the tap position on L1. Note the resistance and capacitance values required to balance the bridge and a point will be reached when the resistance and capacitance required to balance the bridge at the highest frequency are the same as those required at the lowest frequency. This is the correct value for L1. The excess wire on L1 can be removed if desired.

Following the adjustment of L1, the bridge is easily calibrated using a digital ohmmeter, a few precision capacitors and a number of inductors. The resistance control is calibrated by disconnecting the null detector and connecting the digital ohmmeter to X3. The measured resistance, over its range, can be marked on the scale. A 10 Ω increment is sufficiently accurate.

Capacitance can be calibrated by using various precision capacitors in parallel with a resistor of known value. I used a 100 Ω resistor in parallel with capacitors in the range of 20 pF to 200 pF. The capacitors were silver mica types with a tolerance of ± 2 %. Connect each capacitor in turn, balance the bridge and

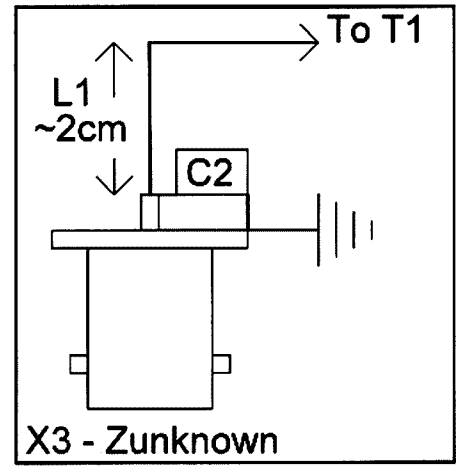


Figure 4: Location and approximate size of compensating inductor, L1.

mark the capacitance on the scale. Use the shortest possible leads on the resistor and capacitor so that stray inductance and capacitance is minimised.

Calibration of 'negative capacitance', or inductance, requires a bit more work.

Table 1 shows a suitable range of inductance and equivalent negative capacitance. Connect the given resistor (R_S) in series with the given inductor (L_S) and connect the series pair to X3. Set the signal generator to the required frequency and balance the bridge. When a null is detected the position of the dial pointer can be marked on the front panel of the bridge. The same can be achieved by using a receiver tuned to the given frequency and using the noise generator for bridge excitation.

Table 1: Sample calibration points for 'negative' capacitance.

R_S(Ω)	L_S(μH)	f-MHz	R_P(Ω)	C_P(pF)
68	1	4.0	77	-190
68	1	7.0	96	-152
27	0.22	28.0	82	-99
68	0.22	7.0	69	-46

The inductors I used were from FARNELL. The 0.22 μH was catalogue number 108-617 and the 1 μH was catalogue number 608-440. The self-resonant frequency of both inductors was well above the frequencies used to calibrate the bridge. Note that the tolerance of the inductors was ± 10 %, so the calibration uncertainty of the negative capacitance is higher than the positive capacitance.

Other combinations of inductors and resistors can be used to calibrate added points if required. For example, if a point at -120 pF is required and you have a signal generator that outputs a frequency of 20 MHz, select a value for the parallel resistor as, say, 100 Ω. The following calculation is then performed to calculate the required inductor:

This means that a series combination of 30.5 Ω and 0.37 μH will be measured as a parallel combination of 100Ω and -120 pF. Thus, the 'negative' capacitance values can be calibrated by selecting a range of convenient inductors and resistors and selecting a suitable measurement frequency. This method is iterative; so many calculations may be involved before obtaining convenient values of inductance and resistance. A spreadsheet or programmable calculator is useful to reduce the effort involved in the calculations.

$C_p = -120\ pF$

$R_p = 100\ \Omega$

$$Xp = \frac{1}{2\pi \times 20 \times 10^6 \times 120 \times 10^{-12}} = 66.315\ \Omega$$

$$Xs = \frac{100^2 \times 66.315}{100^2 + 66.315^2} = 46.06\ \Omega$$

$$\& \quad R_s = \frac{100 \times 66.315^2}{100^2 + 66.315^2} = 30.5\ \Omega$$

$$\therefore Ls = \frac{46.06}{2\pi \times 20 \times 10^6} = 0.37\ \mu H$$

The main difficulty with this approach is how well the value of the inductor is known and this will affect the calibration uncertainty. However it is likely that the end result is accurate enough for most amateur use.

Measurement uncertainty

To assess the measurement uncertainty of the completed bridge, a set of measurements was made using a high quality 50 Ω dummy load as the unknown impedance. The bridge was excited using its internal noise source and a receiver was used as the null detector. Eleven measurements were made of the 50 Ω load at six different frequencies (3.5 MHz, 7.0 MHz, 14.0 MHz, 21.0 MHz, 28.0 MHz & 38.0 MHz). The resistance of the reference potentiometer was measured with a digital ohmmeter and the capacitance was read from the scale after the bridge had been balanced. A mean value and standard deviation were calculated from each set of eleven resistance measurements (See Figure 5).

For each of the measurements the measured capacity was, approximately, Zero. This value is limited by the ability to read the capacitance scale. The results indicate that the measurement uncertainty (for resistance) is generally less than ± 5 % over the range of 3.5 MHz to 38 MHz. The error bars indicate a 95% confidence interval, that is, there is 95% chance that any individual measurement will be within the given uncertainty limits. Overall, the limiting factor is how well the values can be read from the instrument scales, although using a digital ohmmeter helps considerably in establishing the true resistance value. Refer to the previous

comments regarding issues of spectral purity of the excitation frequency, as this will also affect measurement uncertainty.

Conclusion

An admittance bridge that is useful for measuring the resistive and reactive component of antennae and circuit networks has been presented. With care, accurate measurements of resistance, capacitance and (to a lesser extent) inductance are possible between 3 and 40 MHz. The main limitation is how accurately the indicator dials can be calibrated and read.

References

(1) 'RX noise bridge improvements', Robert A. Hubbs, W6BXI and A. Frank Doting, W6NKU. Ham radio magazine, February 1977.

ar

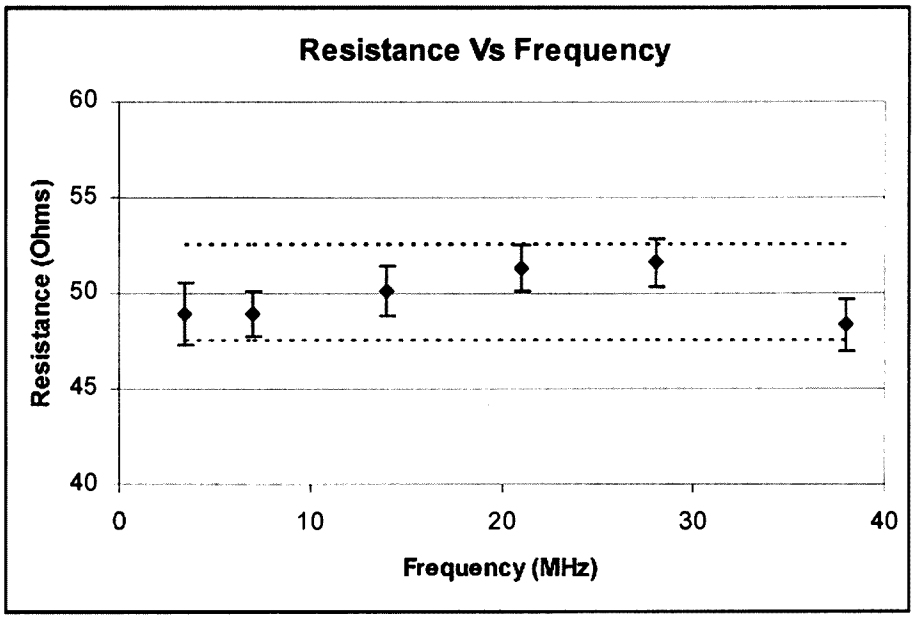


Figure 5: Uncertainty of resistance versus frequency. The mean value of resistance is the central diamond, the error bars indicate ± 95 % uncertainty limits and the dashed lines indicate ± 5 % of 50 Ω.

Unravelling the mysteries of connecting radios to antennas

Brian Clarke, VK2GCE
brianclarke01@optusnet.com.au

The transceiver in your radio shack probably came "off-the-shelf", ready to go. But outside the shack, your HF antenna system and its associated feeder arrangements are essentially "home-brew". This comprehensive article, presented in four parts, will give you all you need to get your antennas working the way they should.

Part 1. Antennas and their feed-point impedances

This article is about the practical application of common antenna knowledge. Its purpose is to unravel some of the mysteries that surround getting our signals in from and out to our antennas, reliably and efficiently. It started out as a presentation on baluns – but the more I marshalled my ideas, the more questions arose about the things on either side of the balun. There may be some surprises compared with present-day folklore.

This is not an exhaustive treatise on antennas and transmission lines – I discuss these in sufficient detail that you can make an informed decision about where you would use a balun to best effect, and how you could roll-your-own. My guiding point of departure in this article is that you want to use a single antenna on as many bands as possible without having to reconfigure it each time you change bands.

When we use an antenna over a wide frequency range, the impedance it presents dances all over the place. Yet, there are certain components that work most efficiently and require the least maintenance if they are worked at constant impedance. The balun is one such component in the path from our transceiver to the antenna.

The Jacobi theorem

When the impedances of our transmission line and antenna match the output impedance of our transceiver, we have the maximum transfer of power to our antenna; in other words, our system is at its most efficient and effective. The same applies in reverse, to transfer the received signals from the antenna down to the transceiver.

There are some other considerations (and costs):

- When the voltage and current excursions on our transmission line are the least (low VSWR, impedances closely matched), it is less likely to suffer from flashover (excess voltage) or melting (excess current) and will require less restorative maintenance. If there is an impedance mismatch and we want to reduce downstream maintenance, then we can space the feed-line wires to reduce the likelihood of voltage flashover; or increase the gauge of the feed-line wires to withstand the higher current. However, increasing the spacing increases the feed-line impedance, increasing the mismatch; increasing the wire gauge may stretch the antenna, pulling it out of resonance. And the wind forces on the larger, heavier feed-line may result in dry joints and even breakages where the feed-line meets the antenna.
- When impedance matching is good (low VSWR, small reflected power) our transceiver is less likely to reduce its power output or go into automatic shut- down. Where the transceiver does not have automatic protection against high VSWR, the output stage – valves or transistors – is likely to suffer voltage breakdown effects, and is more likely to require restorative maintenance, thus increasing the cost of ownership.
- When impedance matching is good we are less likely to generate spurious emissions, which in turn means we are more likely to maintain good relations with our neighbours and other spectrum users.
- And when impedance matching is good (best transfer of received power) we will be able to receive signals of lesser level, increasing our enjoyment of the hobby.

Spectrum access for radio amateurs

Internationally, radio amateurs have access to the widest frequency spectrum after the military. For the enthusiastic amateur, this implies a need to use that spectrum to its fullest. One way we try to achieve economies while enjoying wide spectrum usage, is to try to get our antennas to operate over the maximum frequency spectrum; ie, on as many bands as possible.

Many years ago, when the 'traditional' amateur bands (80 m, 40 m, 20 m, 15 m and 10 m) were being allocated, the harmonic relationship of the bands was thought to be of good value to the radio

amateur and a means of ensuring that any unwanted harmonics would affect only those bands.

Unfortunately, because real antennas need to be shortened about 5% from their electrical length, harmonics don't always fall neatly within the amateur bands. I'm talking here of the harmonics of the antenna, not harmonics of the transceiver. If you strike a bell, it rings at its resonant frequency plus a wide range of its natural harmonics – same for an antenna. So, if you stimulate an antenna off its resonant frequency with a harmonic-laden signal, some of your transceiver's harmonics will be attenuated because they fall off the resonance curve of the antenna but some of the harmonics of the antenna will be radiated.

Let me expand this with an example:

Say we want to set up a horizontal dipole for 40 m (eg, 7.25 MHz), and also use it on 15 m. The required active leg length, when operating on its fundamental frequency, can be calculated from the wave formula:

$\lambda = v / f$

where

v = velocity of the wave in our antenna (300×10^6 m / s)

f = chosen operating frequency

λ = wavelength

Substituting known and desired values, we get

$\lambda = (300 \times 10^6) / (7.25 \times 10^6)$

= 41.38 m

Assuming we are using a thin, uninsulated wire in air, the physical length of a 1/4 leg will be:

$0.95 \times 41.38 / 4$

= 9.828 m (the 5% reduction compensates for "end-effect")

Now, we also want to use this antenna on its third harmonic – the 15 m (λ_3) band. Here, that length of 9.828 m corresponds to two full quarter waves and a 5% shortened quarter wave, because the "end-effect" only applies to one quarter wave

Actual length = $(2 \times 0.25 + 0.95 \times 0.25) \lambda_3$

$= 0.7375 \lambda_3$

So, $\lambda_3 = 9.828 / 0.7375$

= 13.33 m

What is the resonant frequency of this dipole leg?

Rearranging the above formula for f, we get

$f = v / \lambda$

= 22.5 MHz

which is outside the 15 m amateur band. This antenna is too short for amateur operations, and would be capacitively reactive on the 15 m band. Alternately, if we use a slightly longer antenna to resonate on 15m, it would be too long for our chosen spot on 40 m and inductively reactive there.

We get a similar problem with the 'harmonic' relationship between 80 m and 30 m, between 17 m and 6 m, and between 2 m and 70 cm.

In the case of a centre-fed vertical dipole, because the lower leg is closer to ground and is therefore more capacitive, it should be shortened even further to counter that effect.

Antenna feed point impedance (Z_{AE}) vs frequency

As shown above, operating an antenna over a wide frequency spectrum has implications for the feed point impedance. This section is not an exhaustive treatment of all antenna configurations; rather, the most popular and economical forms, the horizontal dipole and the vertical quarter-wave ground-plane, are discussed.

Horizontal dipole

When we operate a horizontal half-wave dipole more than a wavelength above ground, at its fundamental frequency, and fed at its centre, its feed point impedance (Z_{AE}) is resistive and about 72 Ω. If we increase the frequency so that each leg of the dipole corresponds to $(2n+1)1/4$ (an odd number of quarter wavelengths), again we find a fairly low resistive impedance, but greater than 72 Ω. If the frequency is such that the length of each leg of our dipole corresponds to $n1/2$ (an even number of half wavelengths), the impedance is again resistive, but very high – it can be in the order of 5 kΩ. At any other frequency, Z_{AE} is not purely resistive.

If we add parasitic elements, as in a Yagi-Uda antenna, or if we fold our dipole, or make several folded sections of different cross-sections, the centre-fed Z_{AE} (although resistive) may vary from as low as 5 Ω up to 500 Ω.

Off-centre fed dipole antenna

If we feed a resonant dipole off centre, Z_{AE} moves from a minimum of 72 Ω when fed at the centre to around 5 kΩ when fed at the end; eg, the Zeppelin design. Non-resonant off-centre fed (OCF) antennas show a moderately high resistive component, 150 to 200 Ω, but may also have a reactive component. When one section is an odd multiple of $\lambda/4$ and the other section is an even multiple of $\lambda/4$ (the one-third fed version), the antenna will be resonant, but its feed point impedance will be high and unbalanced. When fed at the one-quarter point, we have the possibility of the shorter section being $\lambda/4$ and the longer, $3\lambda/4$; this will be a low Z_{AE} antenna, perhaps 100Ω, and this antenna can only be low impedance on its odd harmonics. Feed the OCF at almost any other fraction of its length and Z_{AE} will be reactive.

Vertical ground-plane

For a vertical $\lambda/4$ ground-plane antenna, the feed point impedance is a little different from that of the horizontal dipole. The antenna feed point impedance is given by:

$Z_{IN} = Z_{AE} + Z_{GND}$

where:

Z_{IN} = actual input impedance

Z_{AE} = intrinsic feed-point impedance

Z_{GND} = ground impedance

If the antenna is a resonant quarter-wave vertical over a horizontal ground plane, at its fundamental frequency, Z_{AE} is about 36 Ω resistive. However, Z_{GND} depends on the actual architecture of the ground-plane. Broadcasters and the military like to plant their vertical antennas in salty marshland or employ around 160 radials when the ground-plane is kept at ground level. If the ground-plane is lifted above ground by about $\lambda/10$ or so, we can get away with as few as 4 horizontal radials. The above-ground system is called a counterpoise.

With a ground-plane anything less than those described above, Z_{GND} becomes quite significant; energy fed into Z_{GND} warms the ground a little but does not radiate. We get a similar effect when we use a VHF/UHF vertical whip on a vehicle and omit to bond all the panels that could form a good ground-plane. If Z_{GND} can be kept close to zero the antenna system efficiency is high and almost all the transmitter output power is radiated.

For example, a four-wire radial system deployed at ground level may have a Z_{GND} of about 10 Ω, depending on the

conductivity of the underlying earth.

So $Z_{IN} = 36 + 10 = 46\ \Omega$

For this antenna system, $P_{OUT} = P_{IN} X$ 36 / 46; ie, about 78% of P_{IN} or nearly 1 dB down.

If the antenna feed point is raised at least λ/2 above ground, and we slope the ground-plane radials down from 90º (horizontal) to around 135º, Z_{AE} becomes about 50 Ω resistive. This only applies at the fundamental resonance. If we continue to bend the radials down to 180º, we get a vertical dipole with a Z_{AE} of about 72 Ω. So, reorienting the radials alters the impedance. When the feed point of a vertical dipole is higher than about 0.4λ above ground, Z_{AE} stays fairly close to 72 Ω.

Thus, the feed point impedance of that λ/4 vertical you have stuck on the roof or bull-bar of your vehicle is unlikely to be 50 Ω – it'll be more like 36 Ω; so, why use 50 Ω feeder cable?

As with the horizontal dipole, at frequencies that are odd multiples of λ/4, Z_{AE} of the quarter-wave ground-plane antenna is resistive but higher than 36 Ω. At frequencies that are exact multiples of λ/2, Z_{AE} is resistive but very high – possibly several kΩ. At any other frequency, Z_{AE} is complex; ie, not purely resistive.

A few words of warning about radials:

- At resonance, the ends of the radials remote from the antenna's feed point have very high impedance and are therefore at very high voltage. Good quality ground-planes, or counterpoises, have a large blob of insulating material on the free ends to reduce the likelihood of electric shock or radiation burns. If you make your own counterpoise, insulate the free ends appropriately. If we assume that the free ends have an impedance of say 2.5 kΩ (a conservative estimate) and we feed 400 W into the antenna, what voltage is developed there?

  Power law $P = V^2 / R$

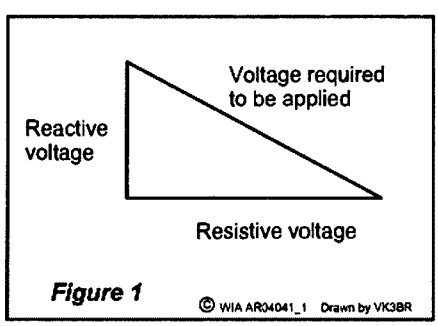
  Rearranging for V, we get

  $V = \sqrt{(P \times R)}$

  Putting in our values of 2.5 kΩ and 400 W, we find that 1 kV is developed.
- Attempting to use the earth as a ground-plane in Australia is asking for trouble – the earth's conductivity is, in general, rather too low. I have seen a vertical ground-plane antenna where one side of the feed-line was connected to an earth spike. Full stop. And the owner/erector wondered why his signal was just about receivable next door, and a VSWR anywhere near 1:1 was unachievable.
- I have also seen counterpoises deployed where the free ends were attached to earth spikes. When the counterpoise is odd multiples of λ/4 long, and the free ends are grounded, Z_{AE} becomes very high, along with the VSWR (the quarter-wave transformer effect). When the counterpoise is any even multiple of λ/4 long, and the free ends are grounded, Z_{AE} approaches zero along with high VSWR (the impedance of a half-wave feed-line is the same at each end). Either way, the feed-line gets stressed and little signal gets in or out.
- If you feel bound to earth your counterpoise, say for lightning protection purposes, only do so near the antenna feed point. In fact, you may need quite an array of earth leads to cope with the tens of kiloamps likely to be carried to earth if your antenna is struck – but keep your lightning protection earth separate from your antenna earth.

Complex impedance

Whenever the feed point impedance is not purely resistive, this means that to deliver a certain amount of power, we need to feed a higher voltage than if the antenna were purely resistive: This is illustrated in Figure 1 below.



Only the power absorbed by the resistive component of the antenna is radiated. So we ought to do something about reducing the reactive component of the antenna impedance, preferably to zero – but more on that later . . ..

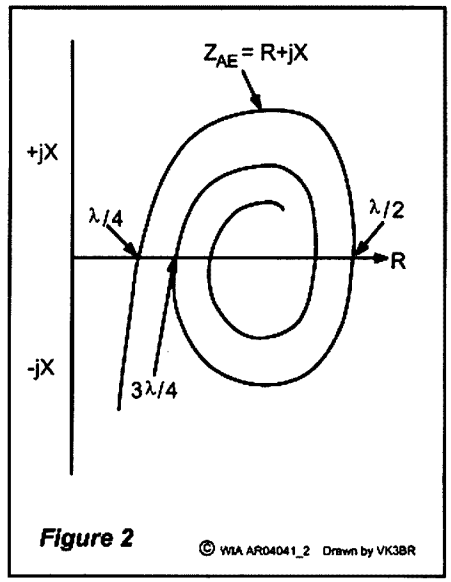


Fig 2 – Feed-point impedance of a fixed-length antenna.

Figure 2 shows how the feed point impedance Z_{AE} changes as the frequency applied to a fixed-length antenna is varied. Its reactance is positive (+jX, inductive) at some frequencies and negative (–jX, capacitive) at others, but the resistive component (R) is always positive.

If you measure the complex impedance vs frequency of your antenna just after you have erected it, you can generate your very own impedance spiral; these data will be invaluable for future diagnostics and preventative maintenance.

Z_{AE} vs antenna height

In the previous section, we assumed that our antenna was a great distance away from any other disturbing objects. At the lower frequencies (longer wavelengths), for most of us this situation is clearly out of the question. We have to deal with buildings constructed of conducting materials, built on odd-shaped and small blocks of land in suburban, built-up areas. We also have to comply with Building Application and Development Application approvals, and maintain harmonious relations with our spouses and the neighbours.

So our antennas, in the main, are limited to 'reasonable' heights, which often means less than 10 to 20 m above ground. When we operate a resonant, horizontal dipole antenna at less than λ/3 above ground, the feed point impedance is very low, and falls almost linearly to zero as the height reduces to zero. To apply this rule to a resonant λ/4 vertical

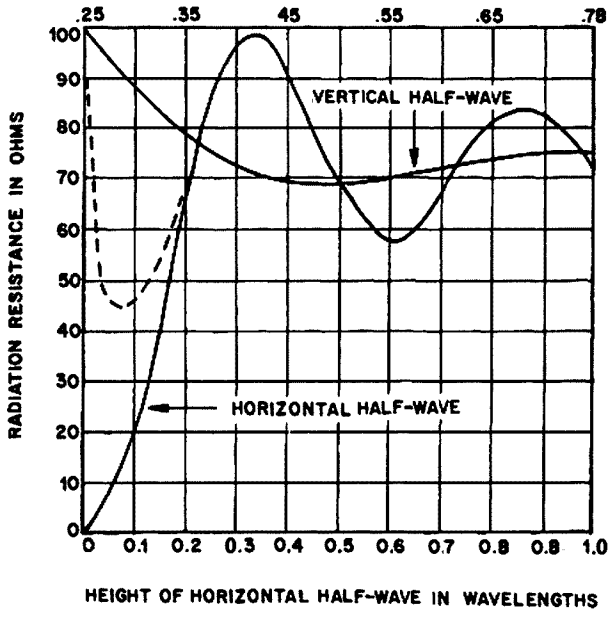


Fig 3 – Feed-point impedance vs antenna height (Fig 16, p3-11 from ARRL Antenna Handbook 1991

ground plane antenna, substitute 'the height of the feed point' for 'height' in the previous sentence.

At the frequency for which the antenna height is 0.18λ, the feed point impedance of a horizontal dipole is about 50 Ω – and that is the only frequency at which this happens. As the height in wavelengths is increased, the feed point impedance oscillates between about 60 Ω and 96 Ω. As the height increases further, the feed point impedance asymptotes to about 72 Ω. These characteristics are plotted in Figure 3 below - note that the oscillation period seems to be about λ/2.

Why do we worship 50 Ω?

There is nothing magical about 50 Ω. It just happens to be a commercial/military solution to a logistical problem. When coaxial cable was invented, the ideal characteristic impedance for use with a horizontal dipole was 72 Ω; and that for use with a quarter-wave vertical ground-plane antenna was 36 Ω – and, strangely, they still are. The cable's characteristic impedance can be changed in the factory by changing the ratio of diameters of the inner and outer conductors, although 36 Ω coaxial cable is a bit difficult to manufacture. But in the field, it can be quite difficult to determine what the characteristic impedance of a cable is. The easy way out was to choose a characteristic impedance that gave the minimum regret. Now the geometric mean of the two contenders is √(36 X 72) = 51 Ω. So, if 51 Ω cable were deployed everywhere, the maximum VSWR with horizontal dipoles (eg, radar and aircraft height gauges) and vertical whips (eg, communications) would be about 1.4:1 – quite acceptable then as now.

Summary of Part 1

We can't alter the laws of physics that govern the relationships between wave velocity, frequency, wavelength, voltage and current in our antennas. The best we can do is to understand them, then adjust the length of the active legs of our antennas and adjust our methods of feeding them to maximise our $ effectiveness and enjoyment. We can measure the lengths of the various active parts of our antennas; we can observe their proximity to potential absorbers, reflectors and re-radiators and make educated adjustments. How to deal with the voltage and current matters, I will come to later.

The main points are:

1. A Z_{AE} of exactly 50 Ω resistive for an antenna is most unusual – it occurs in only a very few specialised situations. Depending on antenna configuration and the position of the feed point, Z_{AE} can vary between 5 Ω and 5 kΩ.
2. The Z_{AE} of any antenna, the length of whose active parts corresponds to a multiple of λ/4, is resistive and resonant. At any other frequency, Z_{AE} is reactive; and the antenna has a lower effectiveness and efficiency – less signal gets in and out, and it costs us more to feed and maintain.
3. When the lengths of the active legs of an antenna correspond to (2n + 1)λ/4, then Z_{AE} is low.
4. When the active leg lengths of an antenna correspond to nλ/2, then Z_{AE} is high.
5. The active leg-length calculations for resonance must take end-effects and ground-effects into account.
6. Apart from lightning protection, there is really no need to earth a ground-plane/counterpoise.

References and bibliography

- *ARRL Antenna Handbook* (1991) though any recent edition should do
- *ARRL Handbook* – any recent edition should do
- Kraus, John D. *Antennas*, McGraw Hill, NY, NY (1988)
- Shrader, Robert L. *Electronic Communication*, 5th edition, McGraw Hill, NY, NY (1985) ch. 20.

Part 2 of this article in next month's *Amateur Radio*

ar

A pi-coupler for the compact 160 m vertical (and HF antennas)

Draw Diamond, VK3XU,
45 Gatters Road,
Wonga Park, 3115.

In a recent article (Jan/Feb AR) outlining the construction of a compact loaded vertical antenna for 160 m, it was declared that a coupler/ATU will be necessary at the transmitter end of the line to obtain an efficient match. When said vertical is operated over the larger portion of 160 m, it is found at some point in the band that the required LC network swaps from needing to be: capacitor on the transmitter side of the coil to: capacitor on the line side of the coil (Reference 1. See also 2 and 3). A pi-coupler is ideally suited to this job, because it can be made to operate in, and between either configuration, and thus match a wide range of impedances.

It is interesting to note that many of the commercially-made automatic ATU/couplers, and at least one RSGB pattern now employ the pi configuration, rather than the recently popular T-match and SPC networks. Although the T-network is theoretically capable of matching a very wide range of impedances to (the usual) 50Ω, in some circumstances it is possible to develop quite high voltages across the capacitor(s), and high currents in the coil of the T-network, which may, in turn, limit the amount of power that can be passed through the coupler (Reference 4).

Provided that the input and output capacitances of the pi can be made as large, or as small as necessary, and that a tapped or roller-inductor coil is used, the pi is capable of matching our 50Ω to high and low impedances, such as may be presented at the station end of random wire and long-wire antennas worked against ground (References 5 and 6).

The pi-coupler is also of great value in allowing, for example, a dipole that is resonant at (say) 3.6 MHz to be operated up on the "DX window" near 3.8 MHz, or down in the CW segment near 3.5 MHz. Placed conveniently in the coax at the station end of the line, the coupler may be adjusted so that the transmitter's output amplifier always "sees" a load that is close to 50 Ω resistive. The SWR on (or in) the line between the coupler and the antenna feed-point remains unchanged of course, and may be as high as 2.5, or even 3 to 1. Nevertheless, at HF,

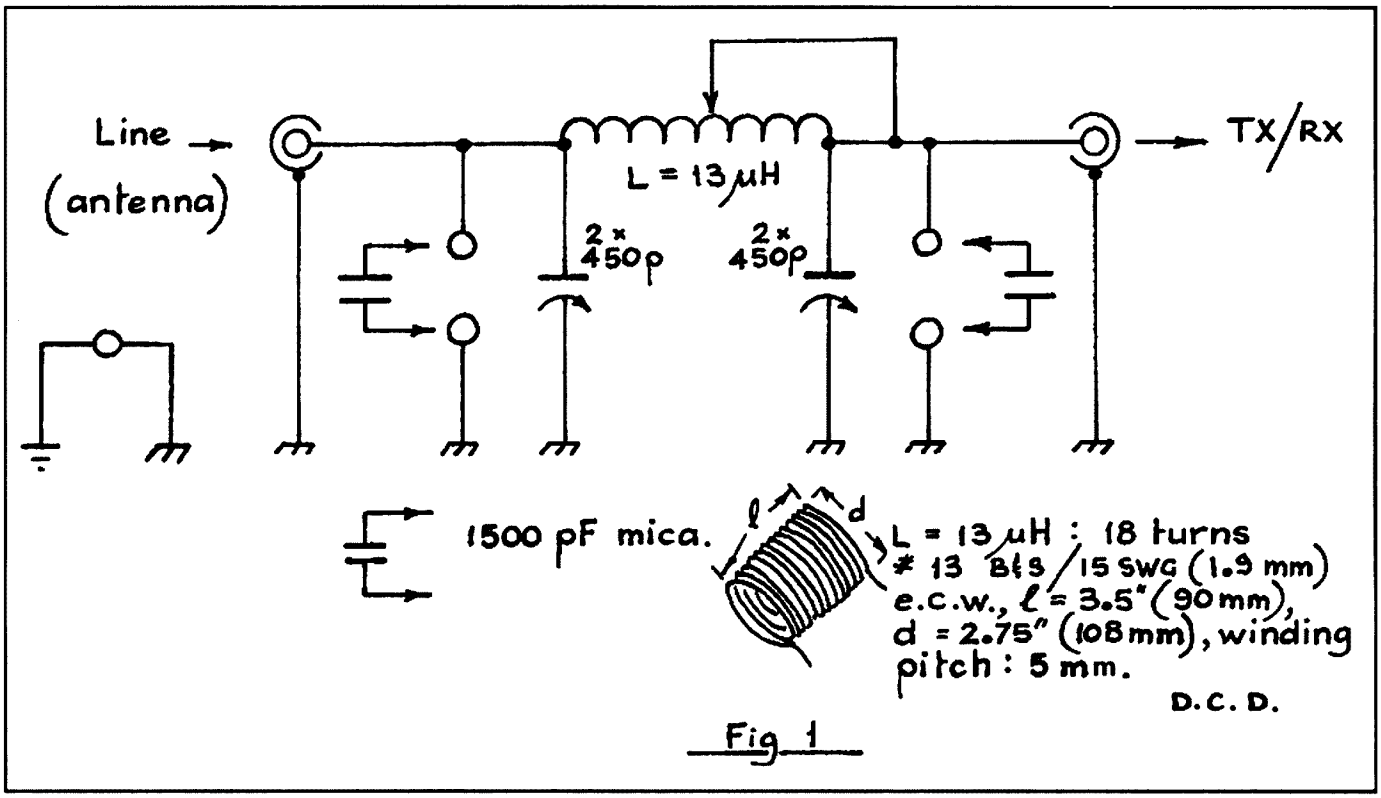


Figure 1

any additional loss in good-quality coax would remain acceptably low. Similar for a dipole cut for the middle of our 7 MHz band.

Circuit

See Figure 1. The frequency response of a pi-network is that of a peaked low-pass filter (Reference 7). The pi therefore offers additional useful attenuation of any harmonic energy present at the transmitter's output.

The only theoretical limitation on the network values (shunt capacitances, and the series inductor) is that the inductor's reactance may be no greater than the square root of the product of the two impedances that are to be matched (Reference 5). In practical terms therefore, it must be possible to adjust the coil's inductance, in this instance from a fraction of a microhenry (µH), to about 12 µH or 13 µH, for use with the compact vertical and/or antennas for 3.5, 7 and 10.1 MHz.

Ordinary Australian 2-gang broadcast variable capacitors have a maximum value per section of about 450 pF, so two gangs wired in parallel per C element gives us 900 pF each side of the coil. Depending upon the nature of the impedance presented to the coupler at the station end of the line, a capacitance of more than 900 pF is sometimes required on either the input, or output, side of the coil. A pair of binding post terminals (or banana sockets) allows an additional fixed mica capacitor of about 1500 pF to be connected across either variable capacitor, thus increasing the range to about 2400 pF on either the input, or output, of the coupler.

For the inductance element, a coil of about 13 µH maximum is required. It may be a roller inductor, or tapped coil, where the unwanted portion of the inductance is shorted with a crocodile clip-lead, as shown in figure 1. It is common practice to do this - for it reduces the possibility of parasitic resonances, and prevents "step-up" or "Tesla coil" effects - where the unused portion of the coil may have disastrously high voltages induced in it.

Some builders are uncomfortable with the notion of shorting unused portions of a solenoid coil (like this one) - a lurking suspicion that shorted turns will incur a loss. We must remember however, that there is considerable flux leakage. That is, the coefficient of coupling for an air-wound coil is substantially less than one.

Shorted turns have much less effect on the total self-inductance than would be the case for a power transformer with an iron core, where shorted turns are a calamity. By shorting the un-used part of the coil, we reduce the inductance of the remainder by only a tad more than would be the case had turns simply been removed by some other mechanism. Any additional loss will be very small provided that the "short-circuiting" is done via a very low resistance path (Reference 8).

Construction

The solenoid coil and two, 2-gang variable capacitors may be accommodated upon a 170 mm wide U-shape chassis, something along the lines of that shown in Photo 1. The 40 mm high rear panel supports the input and output coax connectors, and a chassis binding post terminal (photo 2) for connection of earth/ground - required only for wires worked against ground.

Depending upon the height of your variable capacitors, the front panel may be about 110 mm high. Chassis depth is 210 mm. Most B/C radio type capacitors have a 3/8" shaft, so some sort of adaptor is usually needed to permit a standard 1/4" shaft and knob to be fitted. Illustrated in Photo 3 is an improvised coupler made from a length of ordinary 1/4" i.e. rubber fuel hose. To fit the hose on to the 3/8" shaft, carefully cut two 3/4" long slits at right angles along the longitude.

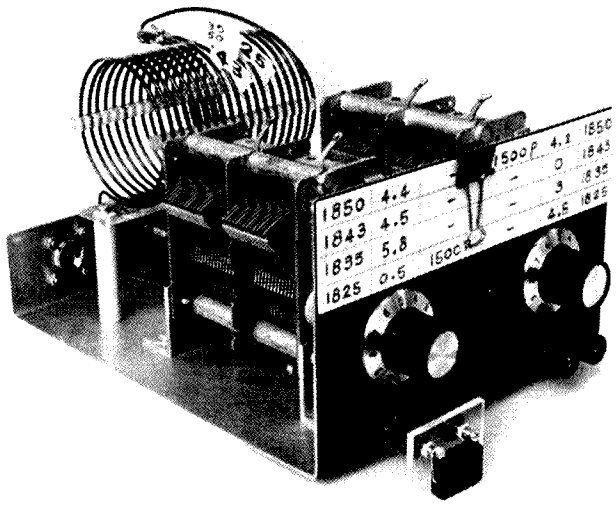


Photo 1

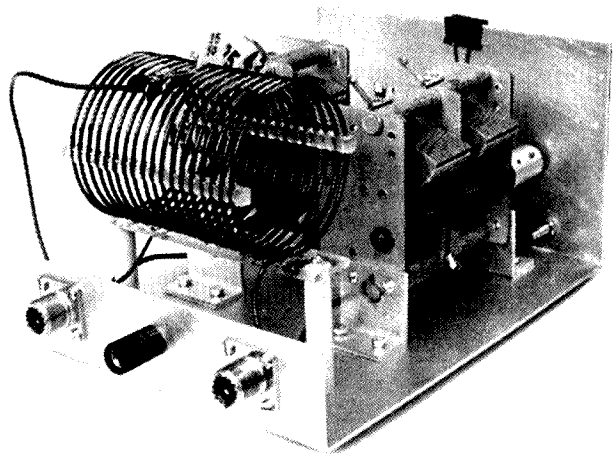


Photo 2

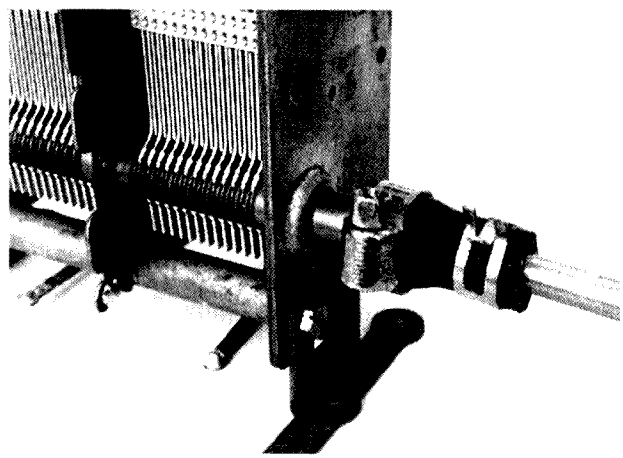


Photo 3

The hose is pushed onto the shaft, and fixed there with a worm-drive hose clamp. An appropriate length of 1/4" (6mm) rod is inserted into the hose and clamped similarly, as shown. A bush, salvaged from a defunct potentiometer may be installed into the front panel so

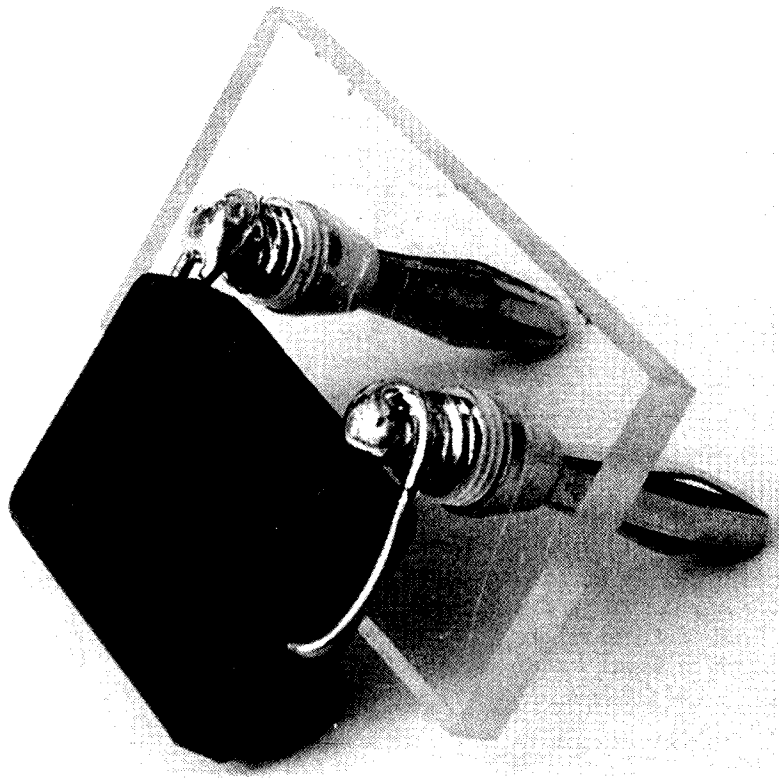


Photo 4

that the shaft rotates smoothly without eccentricity.

The coil may be any well-made solenoid of about 13 µH or 20 µH, with provision for tapping into every turn. A roller inductor of similar inductance would also serve. Some rollers have one end of the coil connected to frame. Check for this, and disconnect or insulate as necessary. A suggested method of making a high Q, 13 µH coil was described recently (Reference 9). The enamel insulation must be removed from a small section near the top of each turn to allow connection of the clip lead. The coil should be mounted upon insulated rods so that it is distanced from metal objects as far as reasonably possible, as illustrated in the rear view, Photo 2.

Binding post terminals, or banana sockets are ideal for receiving the additional plug-in capacitor. A standard spacing of 0.75" (20mm) is advised. Pictured in Photo 4 is a suggested method of accommodating the additional 1500 pF (or thereabouts) mica capacitor, which is soldered to two banana sockets fitted into threaded holes in a suitably sized rectangle of Perspex (or similar) insulating material.

Operation

Connect an SWR meter between the transmitter/receiver and the coupler. Adjust all three variables initially for maximum received signal (or noise). When used with the short 160 m vertical and perhaps 20 m of RG-8 coax line, taps about half-way along the coils are required. It should be found that one cap will be meshed, and the other unmeshed - or partially meshed. If one cap is at full mesh - more capacitance is perhaps required; try plugging in the additional 1500 pF mica cap and re-adjust.

When the coupler appears to be at optimum adjustment, on a clear frequency, apply the smallest tuning signal that your SWR meter will respond to. Carefully re-adjust the caps and coil tap positions (do not touch the coil whilst transmitting) for lowest SWR. All being well, it should be possible to achieve a very low SWR. Repeat for every frequency of interest. Coil tap positions may be recorded by attaching a suitably marked bread-bag closer onto relevant coil turns, as illustrated in Photos 1 and 2. A rectangle of white Laminex (or similar) material is ideal for recording the variable settings in tabular form.

For use with antennas on 3.5, 7 or 10.1 MHz, operation is similar to that described above. All three variables are plied. Capacitor adjustment is much sharper however. At HF it will be found that very little of the coil inductance is required, needing only a few turns at 7 MHz and 10.1 MHz.

A good radio earth/ground must be connected to the coupler's chassis for use with random/long wire antennas. Wires that are a half-wavelength long, or multiple, will present high impedance to the coupler, and problems with flashover (of an ordinary B/C capacitor) may occur. The antenna may simply be shortened, or lengthened, by perhaps two or three metres to bring the impedance back to a moderate value, and thus allow greater power to be used.

Parts

Second-hand B/C capacitors (in my experience) are nearly always obtainable at radio club swap meets. The usual price is around $4 for good ones. To handle RF current and voltage, the additional 1500 pF capacitor(s) must be a mica type. If you have trouble locating one (or two), please write to me at the address shown, enclosing a $1 SASE, whereupon you shall receive two 1500 pF/600 V micas by return post.

References and Further Reading

1. *Radio Communication Handbook*; RSGB, 7th edn, pp 13.39 ~ 42.
2. "The L-Match"; R Cheek, W3VT, *Ham Radio* (USA), Feb. '89, pp 29 ~ 37.
3. "Understanding Impedance Matching"; A Allan, G3ZBE, *RadCom*, Oct. 2003, pp 60 ~ 62.
4. "ATU Power Ratings"; I White, G3SEK, In Practice, RadCom, June '97.
5. *The ARRL Antenna Book*; 17th edn. pp 25.11, 25.12.
6. "Pi-network Antenna Tuner"; P Hawker, G3VA, *Technical Topics, RadCom*, Mar. '87.
7. *Introduction to Radio Frequency Design*; W Hayward, W7ZOI, ARRL, pp 139 ~ 148.
8. "Tapped Inductors"; I White, G3SEK, *In Practice, RadCom*, Apr. 99, p 37.
9. "Another Method of Making 'Air-Wound' Coils"; *Amateur Radio* March 05

ar

More information on the VK5BR_X3 antenna

(Including detail for an 10 metre and 80 metre version and an alternative 20 metre version)

Lloyd Butler VK5BR

The following adds to information published in previous issues of *Amateur Radio* concerning the VK5BR_X3 antenna and which included detail for 20 and 40 metre models of the antenna. Further detail is now given for 10 metre and 80 metre models and also an alternative assembly for the 20 metre model.

The idea of this antenna (and in fact other crossed field antennas) is to provide interaction between the E and H induction fields in a similar form to what they must be when part of an EM wave. That is, they are set up to be in phase and at right angles to each other. This apparently improves the coupling of energy into the EM wave and the effect shows up in the small antenna as an increase in radiation resistance and ultimate increase in radiation efficiency. The article includes measurements taken to demonstrate this result.

The complete tuning and matching system for the X3 antenna is recalled by the diagram of figure 1. For more detail, refer to the previous articles in Amateur Radio.

The 80 metre X3 antenna

The 80 metre antenna is similarly constructed to the 40 metre version described in my previous article with the same square galvanised pipe sections for the E Field plates but extended to 90 cm in length. The coil diameters have been increased to 110mm with an aim of obtained values of Q approaching 400. The high Q was considered necessary to achieve high efficiency on this band with such a high capacitive reactance across the plates. The assembly information, not drawn to scale, is given in figure 2.

Whilst I have advocated open wire line for the tuneable feeders of the higher frequency antennas to minimise transmission loss, I consider ordinary "figure of 8 power flex" quite good enough for 80 metre operation providing the feeder line is not too long.

I measured the characteristic impedance of some of this cable and found it to be around 110 ohms. I measured the transmission loss in 15 metres of cable terminated in 50 ohms which represented a fair degree of mismatch. The transmission loss was a mere 0.6 dB. Operating the line in the tuned mode with the X3, the mismatch would probably be much worse than this but hopefully one would aim at a lesser length of line.

Some brief tests using the field strength meter indicated similar characteristics to the higher frequency antennas which demonstrated higher field strength skewed towards the ends of the dipole plates and lesser field at right angles to the line of the plates. Later tests have indicated that this is a characteristic of the near field (or induction field) and at distance, the strongest signal occurs when the antenna line is at right angles to the direction of transmission.

A comparison in signal strength was recorded between the X3 antenna mounted in the vertical plane at a height of 1.5 metres and a 5/8 wavelength long wire antenna resonated against ground. A station 2 km away recorded the X3 antenna as one S point below the wire antenna.

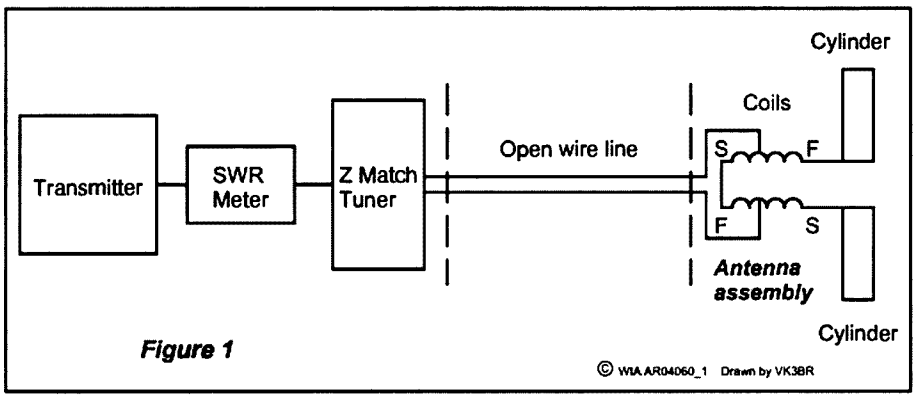


Figure 1

An alternative 20 metre assembly

In a previous article, I showed an assembly for the 20 metre X3 antenna using cylinders for the E plates. Based on the method of assembly used in the 40 and 80 metre antennas, an alternative 20 version of the X3 antenna has since been made as shown in Figure 3.

The capacitance between the plates for the new model is lower than that of the previous model and using the same coils gives a natural resonance somewhat higher than 14 MHz. To compensate for this, the inductance of each coil (previously 6.3 µH) was increased to 7 µH using 11 turns on a 60 mm PVC former.

X3 antenna for 10 metres (Figure 4)

A 10 metre antenna has been assembled so that, with the shorter wavelength, some tests could be carried out within the suburban backyard but outside of the near field region. The antenna is constructed on similar assembly lines to the lower frequency versions shown in figures 2 and 3.

The dipole legs are made of 19mm (3/4 inch) square brass tubing which I had on hand and each leg is 170mm long. The legs are separated by a gap of 30mm.

The two coils are each 12 turns, tapped at 3 turns and wound on 34mm PVC round tube which is cut to 65mm length. They have an inductance of 3.5 µH. The two coils in series resonate with the dipole capacitance within the 28 MHz band.

Two Plexiglas plates 95mm x 85mm are screwed to the square dipole plates to secure them apart and provide a mount for the two coils similar to the assembly in the lower frequency antennas. The coils are bolted through 10 mm spacers to the plates.

I have carried out a lot of performance testing on Z Match Tuners, but not on 10 metres. Hence there was a question of how well they might work with the X3 system at 10 metres. My Single Z Match unit matched up OK and appeared to be working efficiently. Operation with a short length open wire line within the radio shack produced a little bit of current unbalance in the legs of the line. However the currents balanced up quite well with the antenna mounted outside and connected by a longer length of line. I was unable to get a satisfactory match using my Two Coil Compact Coil (Rononymous) Z Match Unit.

Using the 10 metre X3 antenna and a field metre, I was able to confirm that outside of the near field zone, best radiation occurred when the antenna was mounted vertical and that it appeared vertically polarised.

Radiation efficiency

The ultimate test for the antenna is its radiation efficiency or the ratio of power radiated to the power fed its input terminals. One way to evaluate this efficiency is to consider the ratio between the total series load resistance Rt and the series loss resistance RL which is mainly due to the RF resistance of the series coils.

I discovered an easy way to get this ratio for the X3 antenna. The resistance component at the input terminals to the coil taps is first measured to give a value Rta with the antenna circuit at resonance. The antenna plates are then disconnected and replaced with a capacitor of such value as to again bring the circuit to resonance. A new value of resistance component RLa is read. Juggling some mathematics, I discovered that the ratio RLa/Rta is the same as the ratio RL/Rt and that the efficiency can be derived as:

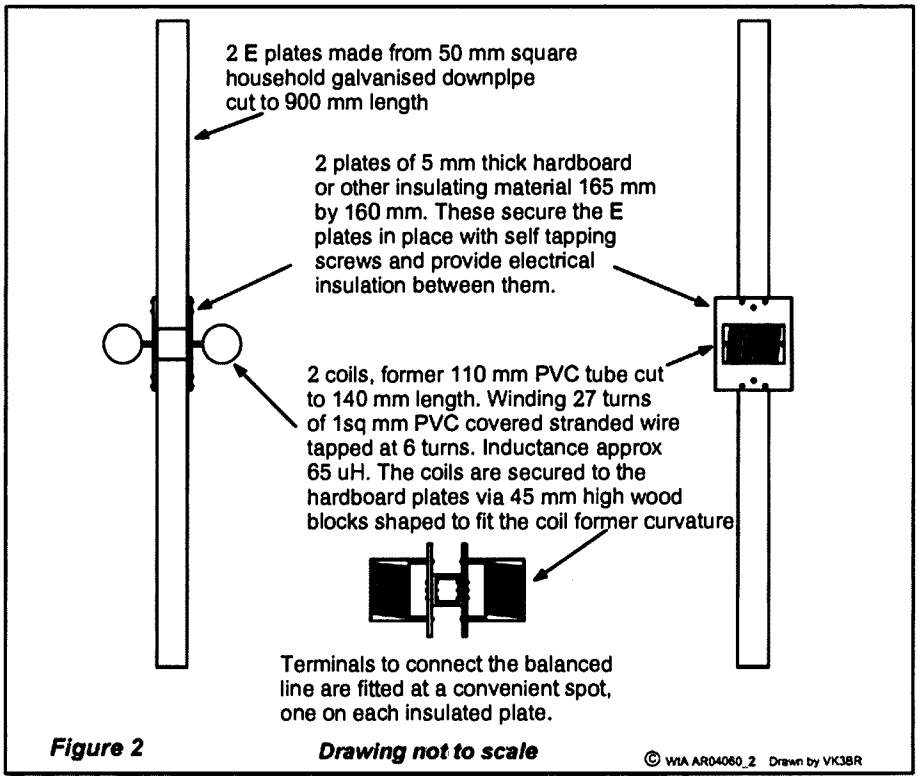


Figure 2

Efficiency = 100(1 - RLa/Rta)%

Values of Rta and RLa vary quite a bit with actual frequency and the proximity of objects near to the antenna but typical measured values and the efficiency which results are given for the three X3 antennas I have assembled (In the case of 20 metres, the results are those obtained using the original 20 metre assembly as described in my first article):

20 metres - RLa = 7 ohms Rta = 90 ohms
Efficiency = 92%

40 metres - RLa = 6 ohms Rta = 80 ohms
Efficiency = 92%

80 metres - RLa = 6 ohms Rta = 62 ohms
Efficiency = 90%

Comparison to a simple dipole

We now compare the above efficiency with a simple dipole of similar dipole length as the 80 metre X3 and operated on 80 metres with the same loading coils as used in the X3.

A well known formula for the approximate value of radiation resistance in a simple shortened dipole is as follows:

$Rr = 320(\pi Lr/\lambda)^2$

where Lr = Effective length in metres and λ = wavelength in metres

Lr = $2L/\pi$, where L is actual length in metres

Hence $Rr = 320(L/\lambda)^2$

The length of the X3 is about 2 metres

so $Rr = 320(2/80)^2 = 0.2\ \Omega$

The RF resistance (RL) of the two series coils in the X3 has been derived as 10 ohms.

So efficiency for the simple dipole can now be derived as:

$100(Rr/(Rr + RL)\ \% = 100[0.2/(0.2 + 10)] = 2\%$

The calculations of efficiency for the X3 antennas are based on losses in the antennas in isolation with their loading coils. Added to the losses are the losses in the transmission line and losses in any matching unit in the radio shack. In the case of the X3, this includes the Z Match tuner.

Tests on the 40 metre antenna with 50 watts of power fed to the antenna have shown that the coils run cool, demonstrating again that little of the power is lost in the coils.

To offset one claim that the power is consumed in common mode radiation, the currents in the two line legs feeding the antenna were measured to be equal and no common mode current was detected by coupling the line pair through a toroidal cored current transformer.

There is just no evidence of any appreciable common mode current

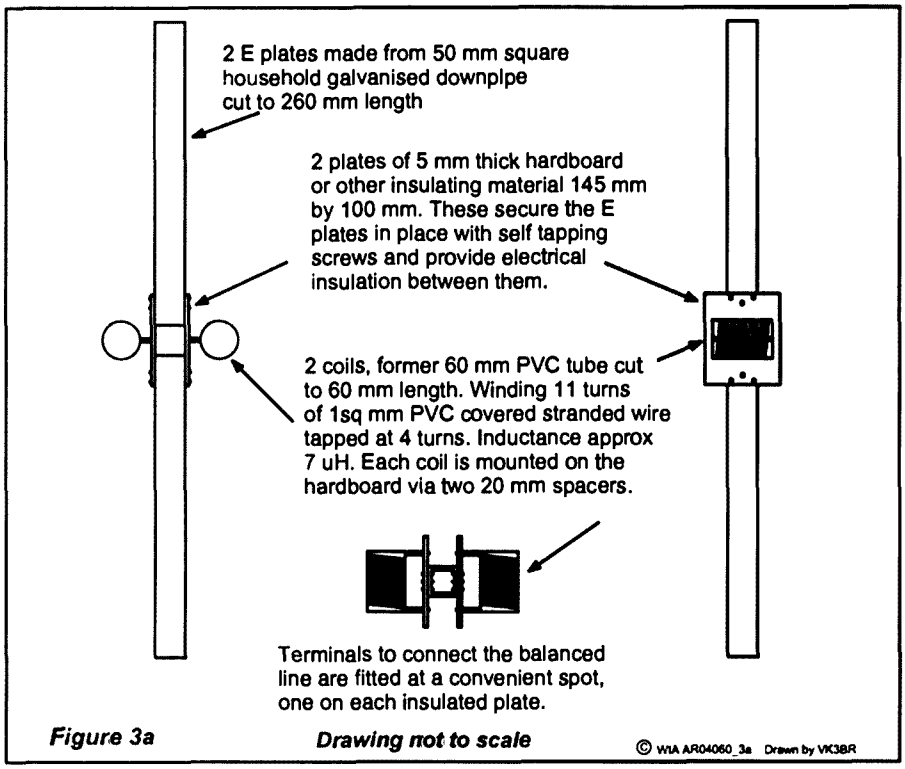


Figure 3a

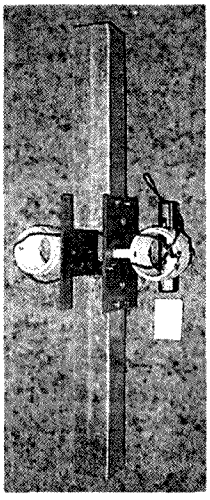


Figure 3b

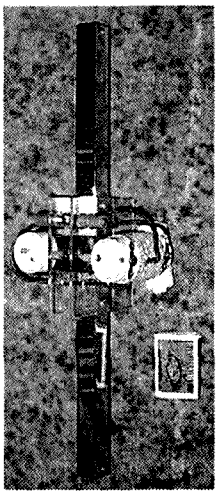


Figure 4

running down the open wire pair in this antenna.

Some notes on field interaction

In the X3 antenna, the coils are orientated so that the line of maximum magnetic field intensity through the centre of the coils is at right angles to the E field between the plates. Someone suggested that we could prove the validity of the interaction between the two fields by simply rotating the coils by 90 degrees so that this field line was no longer at 90 degrees to the E field.

However in doing this, I found the antenna was still able to operate. The explanation of this is shown in figure 5 which shows a typical magnetic field around an open coil. The field at points (1) through the centre of the coils is the strongest but the lines curve and at points (2) there is still a strong field at right angles to (1). The presence of these fields and the line they follow for (1) and (2) are easily proved out using the test device shown in figure 6.

But there is one test which demonstrates the interaction which takes place between the H field from the coils and the E field from plates. Using a field strength indicator at some distance from the X3 antenna shows a concentration of the field in a line with both plate ends. Reverse one coil by 180 degrees so that its field is reversed and the field is concentrated at one plate end.

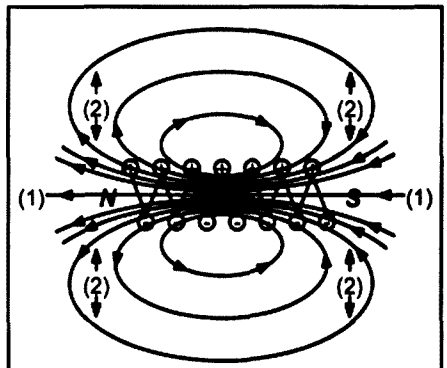


Figure 5

It was suggested that this could simply be caused by the mutual inductance between the coils. However the coils are so far apart that mutual coupling is very small. To check this out, I measured the combined inductance with the two coils in series and could not find any difference in the reading when the one coil was reversed.

Summary

Models of the X3 antenna for 10 metres and 80 metres have been added to those previously published for 20 and 40 metres. An alternative assembly for the 20 metre model has also been added.

Various test details have been given, including measurements to demonstate the effect of radiation resistance increase which takes place in the X3 antenna due to its field interaction and the resultant improvement in radiation efficiency.

References

1. Refer to articles on the VK5BR_X antenna in previous issues of Amateur Radio.
2. Refer to articles on the X3 and the EH Antennas by VK5BR at:- http://www4.tpgi.com.au/users/ldbutler/

Or link from:-
http://www.qsl.net/vk5br/

ar

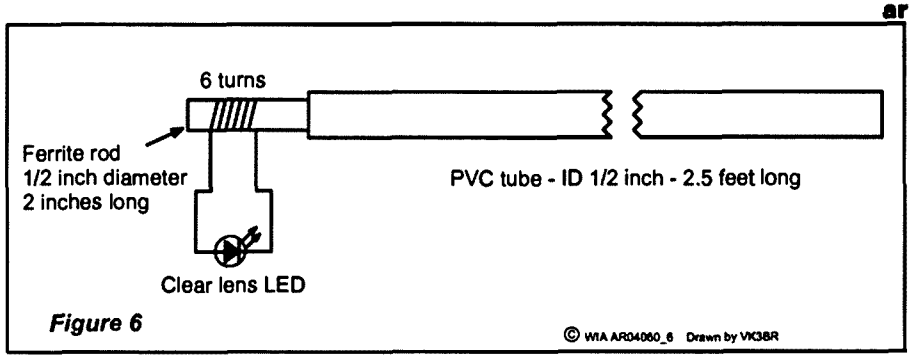
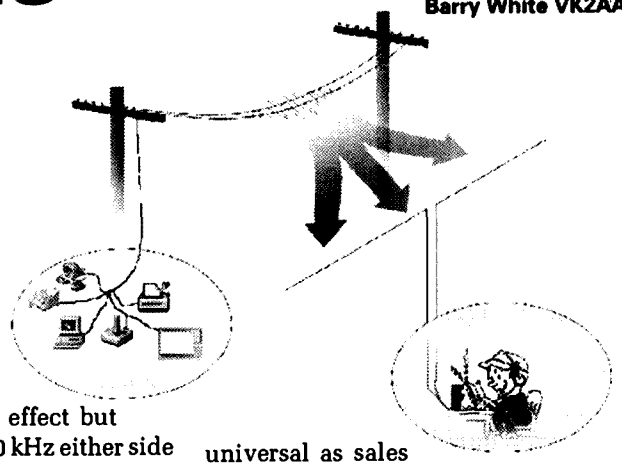


Figure 6

A primer on power line carrier systems

Barry White VK2AAB



I have collected the information here for my own use as well as other interested radio amateurs and any others endeavouring to understand the technology and implications of PLC. The initials PLC, PLT and BPL all mean the same thing – broadband data transmitted over the power lines using radio frequencies in the range 1.4 MHz to 80 MHz. There are two system arrangements. One is for in-building usage and the other, known as the access system, is used between the electricity substation and the customer premises.

Technical information on the various proprietary systems is difficult if not impossible to obtain. The only information admitted by the companies supplying the equipment is that they operate in the range between 1.4 MHz and 80 MHz, and that various modulation systems are used. There are a number of manufacturers and the majority appear to use the DS2 chipset manufactured by DS2 of Spain.

MainNet confirms it uses spread spectrum and it has been determined independently that they use sequential frequency stepping. Their signals sound like a crackling noise no matter where the signal is tuned. The frequency band used is uncertain. It is believed by ARRL to be from 5 MHz to 25 MHz with continuous coverage over that range. MainNet feeds the signal directly into the customer premises.

Ascom and Mitsubishi Electric use ODFM with multiple carriers using the DS2 chipset. It is likely that Ascom equipment is re-badged for other suppliers. The down link uses 2 to 12 MHz frequencies with centre frequencies of 2.4, 4.8, 8.4 and 10.8 MHz for the path to the customer and 19.8, 22.8 and 25.8 MHz centre frequencies for the uplink. The bandwidth of each of these signals is one Megahertz. However these frequencies are nominal as the equipment now being deployed in the US can be moved to avoid interference or to fit their own band plan.

These signals produce multiple carriers 1.1 kHz apart all across the spectrum used.

However the 1 MHz bandwidth for each centre frequency does not end in a "brick wall" filter effect but decreases over about 150 kHz either side of the signal.

HomePlug 1.01 is a company standard. It uses 3 MHz to about 24 MHz. It has 30 db notches in all amateur bands except 60 metre. These notches are not quite enough to provide protection in RF quiet neighbourhoods when the power lines are close to the antenna. This equipment is intended for use in in-house networking of two or more computers.

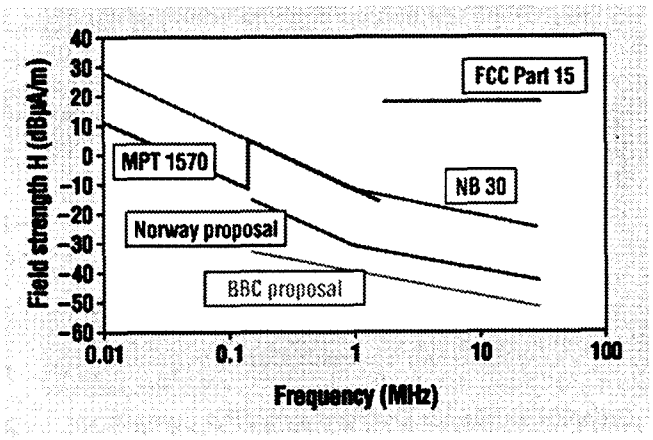
There are significant frequency allocation problems in trying to avoid amateur bands and the same time avoid significant commercial frequencies such as for aircraft and shipping. This is complicated when repeaters have to be inserted into the path and a different group of frequencies needs to be used. If short wave broadcast frequencies have to be avoided then an impossible allocation problem exists. In addition in house systems such as Home Plug frequencies have to be avoided. The Ascom system uses a different group of frequencies in the customer premises with a translator fitted into the power meter box. This further complicates the allocation problem. There is no certainty this arrangement is universal as sales brochure diagrams do not always show that arrangement.

Standards

One of the advantages of standards is that there are plenty from which to choose. This is rampant in the PLC field. In Europe a standard called NB30 is in use in Germany. In the US the suppliers are using the FCC Part 15 rules as they are more liberal that NB30. In the UK there has been no decision on a standard and the trial installations are operating under no standard.

However while all these standards produce strong interference the manufacturers are pressing for higher power levels.

At the Power Line Communications Conference in Sydney in July 2004



Graphic courtesy Dr Diethard Hansen & Compliance Engineering

The BBC and Norway are pressing for much lower standards.

the ACA stated that they would not be introducing a unique standard for Australia but would adopt one of the overseas standards sometime in 2005.

One of the difficulties is that all existing standards were written for a point radiator and not for a device with a significant antenna connected so that the signal may be stronger at a place many wavelengths from the transmitter.

The whole scene is a mess of non-compliant systems that exceed the various standards on many typical installations. There is no agreement anywhere on exactly how the radiation from the PLC system should be measured. In the US the National Transmission and Information Authority suggests that measurements are taken along the power line until the highest radiation point is found. Other suggestions are at certain wavelengths from the transmitter and others at the transmitter.

It is starting to be evident that an irreconcilable position is being reached.

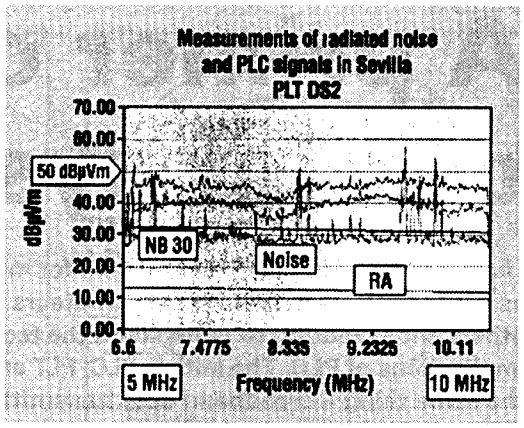
The interference level is too high and radio users are demanding lower levels and the PLC companies are demanding higher levels because a reliable service cannot be maintained at current power levels.

Installation differences

In Europe in most cases the power mains are underground cabling, sometimes in armoured cable. Certainly in older installation the Armour is a woven metal sheath. It is possible in more modern installations that the outer sheath is plastic. The underground installation reduces the radiation from the mains cable significantly but unfortunately not enough.

In the US the mains is distributed in three phases but a street may only have two of the phases plus neutral. Because the customer only has 110 volt, pole transformers are used every three or four houses. Because of these transformers the PLC signal has to get around the transformer. Some sort of filter bypassing around the transformer is employed between the higher voltage supply and the 110-volt lines. Earlier some concern was expressed about the risk of failure of these bypassing devices in the event of lightning strike or other failure. In such an event some thousands of volts would be fed to the domestic premises. No mention has been made of this concern in recent times. MainNet claim that they do not need these bypass filters as their signal can get through the transformer. How they do this is not revealed but the only logical way would seem to be by the use of higher RF power and relying on capacitive coupling between primary and secondary.

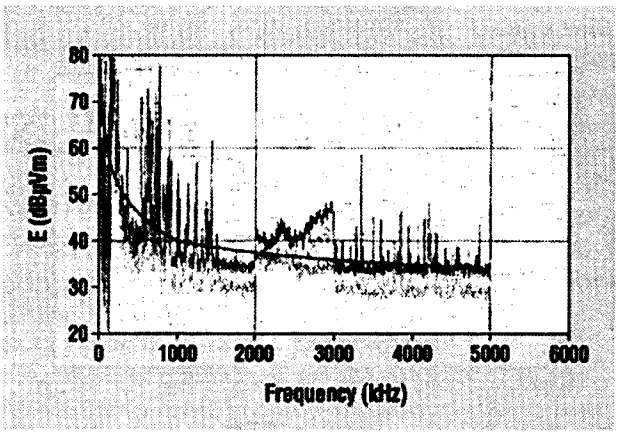
Some installations are using WiFi 2.4 GHz links from the transformer to the PLC customers. This approach may have been used because of the cost of bypassing the transformers and providing interface equipment at the customer mains box to connect to the in house system where the customer uses HomePlug.



Graphic courtesy Dr Diethard Hansen & Compliance Engineering

Figure 2. PLC radiated emissions about 20 dB over NB 30 RA UK MPT 1570 old limits, -20dB below NB 30 (Source: PLC Forum WS 2001 Brussels).

These graphs show the PLC signal level typical of many PLC installations.



Graphic courtesy Dr Diethard Hansen & Compliance Engineering

Figure 1. Siemens/RegTP 2001 (Cologne) PLC field trials, +17 dBm, PLC Carrier 2–3 MHz, radiated emission (13 dB over NB 30 with high background noise).

So far only one access system has been installed in Australia. The system is operated by Aurora Energy in Hobart and is supplied by Mitsubishi Electric. It is an underground installation to four houses near the Aurora office. Only a very brief listen on a portable receiver during an inspection visit was possible. Further tests will be made at a later date.

Access systems in Australia are likely to follow the methods used in Europe due to the similarity of the electrical system except that as the mains are generally on street poles the noise level will be higher. Direct feed to the customers PLC modem is thought to be the method intended. However there are interference problems where in house HomePlug equipment is used. The HomePlug equipment is available from both Dick Smith and Harvey Norman stores.

I am indebted to Diethard Hansen HB9CVQ/DK2VQ and Compliance Engineering magazine for permission to reproduce the graphs. The complete articles by Diethard are given in the references.

References

www.arrl.org/tis/info/HTML/plc
www.urc.es/plc
www.gobpl.com
www.rsgb.org.uk
www.mainnet-plc.info/index_en.html
www.qsl.net/rsgb_emc/emcslides.html
http://www.ce-mag.com/archive/03/ARG/hansen1.html
http://www.ce-mag.com/archive/03/ARG/hansen2.html
http://www.ieee.org/organizations/pubs/newsletters/emcs/winter01/hansen.htm
http://www.euro-emc-service.de

ar

Technical abstracts

Peter Gibson VK3AZL

Surface mount test tweezers

In Hints and Kinks in QST for November 2004, Dean Poeth, K8TM describes a simple tool that allows rapid sorting and testing of unmarked surface-mount components.

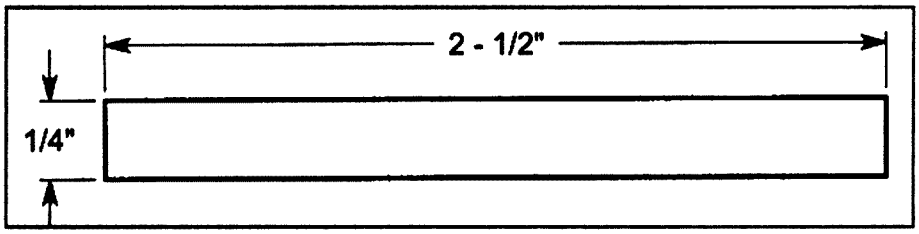


Figure 1 – Fingers for the SMD test tweezers are made from two pieces of single sided glass PC-board material

Passive surface-mount devices (SMDs) are frequently unmarked and can be difficult to test. If you use test probes and a multimeter, they may flip or spin out of the probe tips when you apply pressure, which can be very frustrating.

To solve this problem, build the SMD tweezers described below. They grip the SMD resistors and capacitors squarely, allowing for quick and easy measurements. When used with an auto-ranging multimeter, the value of components can also be double-checked before mounting them on the circuit board when assembling a project.

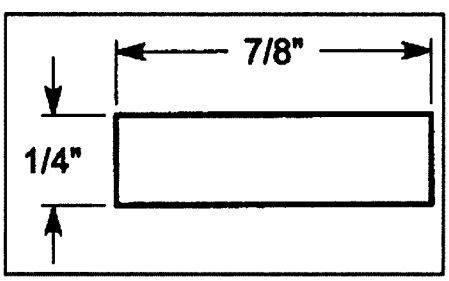


Figure 2 – The spacer block is made from any hardwood

The tweezers consists of three components. Cut out the parts as shown in Figures 1 and 2, two parts as per Figure 1 and one part as per Figure 2. Use a plastic abrasive pad to polish the copper side of the PC board until it is shiny. Glue the assembly together (Figure 3) with 'five-minute' epoxy, making sure the foil sides face inwards. After the epoxy has cured, squeeze the tweezers together and carefully sand the tips so they are flush with each other and square. Remove any sanding burrs from the ends with a small file. Next, carefully solder (don't overheat the epoxy) the test leads to the foil. Finish the tweezers with heat shrink tubing or electrical tape arranged to dress the wires out of the way. Keep the multimeter leads short to minimise stray capacitance.

To use the tweezers, simply connect them to an auto-ranging meter and grip the SMD. Very rapid measurements are possible using this simple tool.

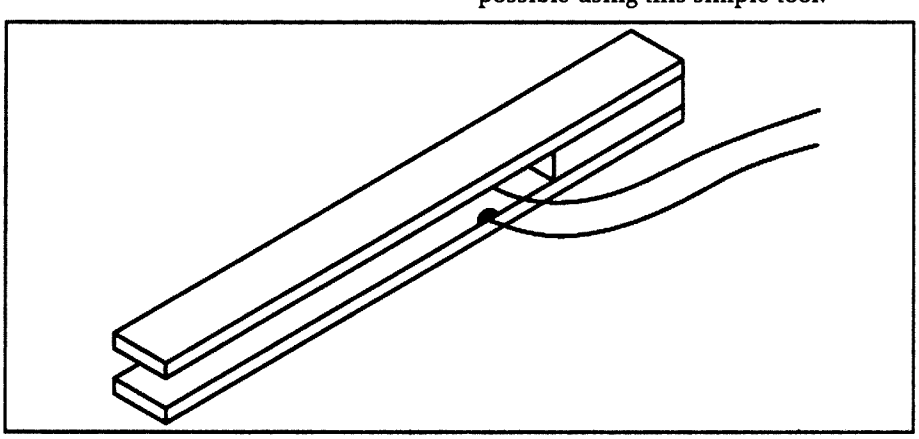


Figure 3 – Assembly of the SMD test tweezers

Lightning protection

Kev Peacock VK4VKD

During the recent months we have seen some horrific storms along the Eastern seaboard of Australia. While wind is a big problem for all radio enthusiasts, an even bigger problem can be the intensity of lightning strikes that come with these savage storms.

As most people already know, I am in the business of building towers and antennas. One of the most often-asked questions I am presented with is, "How do I prevent lightning from striking my tower?"

Well, the answer to that question is simple – you cannot prevent lightning from striking your tower!

Why?

Rather than create an atmosphere of fear I should qualify that statement – you cannot PREVENT lightning from striking – but you can reduce the damage sustained by your station when it does strike.

I have reproduced here an article by a US company called PolyPhaser – this article will explain more clearly why you cannot prevent a lightning strike and it will also show you how you can minimise the damage if it does happen.

One of the features of the towers that I invented and build is the ability to reduce the overall height of the installation by easily and safely lowering the whole antenna array to a position closer to ground. This leaves only the standing tower as the high point and as you will see from the PolyPhaser article, the tower should be properly and adequately grounded to dissipate the instantaneous surge that comes with a strike.

Enjoy the article – and hopefully it might be you who gives me a call and says, "Thanks mate, I grounded my tower after reading that article. We had a lightning strike and the station survived."

Thanks PolyPhaser, for permission to reprint this material.

Grounding overview

- reprinted from the PolyPhaser catalogue

The severity of a lightning strike is a statistically predictable event. An economically designed protection/ grounding (P/G) system should take into account a typical-to-large strike. The P/G system should be maintained on a monthly, or at the very least, yearly basis. This should include testing protectors, measuring the ground system (resistance), pulling on ground rods and cleaning/inspecting connections for corrosion and tightness. It should also involve a re-evaluation of the overall system design each time new equipment is installed, moved or modified.

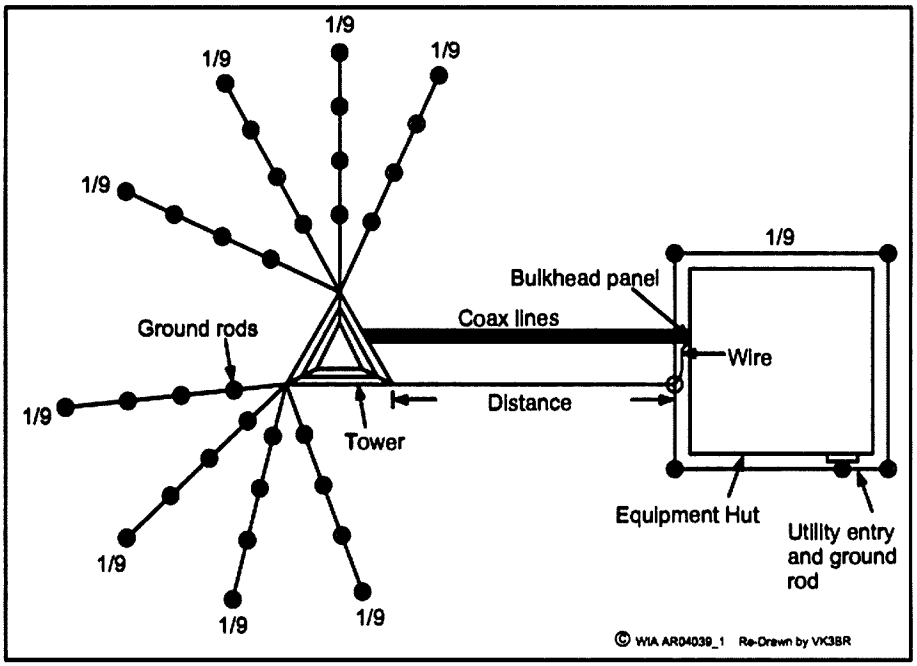
A lightning strike starts with a local electrical breakdown of the atmosphere (a step leader) and it steps about 46 m in 1 microsecond time increments every 50 microseconds. During each of the 49 microcsecond dormant stages, an imaginary hemisphere of 46 m radius can be used to determine the next jumping distance. Any object which penetrates this hemisphere can be chosen as the point of attachment for the return stroke (lightning strike).

Since this is a hemisphere, the geometry of a horizontal strike to a tower can occur anywhere above the 46 m point over average terrain (side mounted antennas above this height are vulnerable). This has led to the 46 m radius "rolling ball" concept, where an imaginary ball of that radius is rolled along the ground in all directions. Each touch point of the ball, with any ground mounted object, is subject to an attachment point (hit). Coax grounding kits should be installed every 23 m above the 46 m point. Install additional kits below 46 m at the middle, bottom, and prior to the building entry bulkhead.

Lightning will take the path of least impedance, which is both resistive and inductive. The larger the conductive surface, the lower the inductance. Bends add inductance. Ground wires should be large and run straight for minimum inductance and voltage drop. They also should be separated from all other conductors by 15 cm to 20 cm and should not be run inside or through a conductor unless they are bonded to it. In conduit, ground wires should be bonded on both the entrance and the exit. When working with a metal wall, bond the ground wires to both sides. Do not go through the wall.

Your tower will be the point of impact like a pebble going into a still pond. The rings will be equi-potential waves as they diffuse into the surrounding soil. The ground wires in the soil still have inductance. This inductance, shunted by the soil resistance, sets up a time constant or velocity of propagation (since capacitance is present also). The "ripples" will propagate faster with larger surface area wire and better conductive soil. The doping of soil with MgSO4 (epsom salts) can help increase soil conductivity and help retain water.

It is not necessary to run interconnecting rings around a tower. Self-support (free standing) towers will equalize the surge current to each leg (the coax leg may have slightly more current). Guyed towers should not have rings, even if the rings are to act as a collector for the radials. If each radial is interconnected directly to the tower base or leg, the inductance would be less than having only one or two connections going to a ground ring. Rings further out would be connecting radial ground rods that will have the same potential at the same point in time, thus little current will flow as compared to taking the same material and effort and running another radial from the tower base. Guy anchors should be grounded with no dissimilar metals (see PolyPhaser's book "The 'Grounds' for Lightning and EMP Protection", Second Edition, Page 24). In poor soil conditions, radials can be used together with ground rods to ground the anchors. A ground system can be obtained in many ways, but the most economical is with radials and ground rods. Radials of



Typical commercial tower earthing system

less than 30 m will disperse the tower base or guy wire energy outward while the ground rods can help take it to lower, more conductive soil layers. If the surge is not leaked or launched into the soil in the radial section(s), the ground rods, if lower soil conductivity can't be found, will develop high "E" fields and can arc in the soil to spread the charge outward. (This arcing is less likely in soils with higher conductivity.)

Arcing can cause glassification around the rod starting at the tip and working upward. The hot plasma fuses the silica sand, which is present in the soil, into a glass, which is a good insulator, since water is boiled out in the process and ground moisture can no longer contact the ground rod surface through the glass. This is why, as a routine maintenance, a tug on the rod, which produces easy movement, is a possible indication of glassificatian.

The whole practice of lightning protection is to control the discharge path and not have it randomly disperse in any direction. In normally conductive soil, two rods should be spaced the sum of their lengths. One long, deep rod or well casing will not be as effective as an array of radials and ground rods. Even if the one deep rod measures a low resistance, the inductance is usually much greater in conductive upper layer soil conditions, and saturation can occur which can cause eddy currents and additional inductance.

Unlike the radials, ground rod diameter size will have little effect on impedance unless the rod is very long. It is not always imperative to reach the water table, since this may be too far for the rod to be effective. It may be easier to salt dope the rod or use a chemical ground rod that collects precipitation. In poor soil conditions, the spacing of ground rods should be closer. Poor ground conductivity will not shunt the radials' inductance, thus more ground rods will help by either reaching more conductive soil or arcing to relieve the voltage potential. If not quickly dispersed, the voltage will build up at the tower and attempt to go another, perhaps unwanted, path (most likely into your equipment room).

All radials should be run away from the equipment building. The more radials there are, the more the current is divided. A perimeter ground system (ring around the building) will help form an equipotential plane. If this ring is approximately equal (in length) to each radial and if eight radials are used, each will have 11.11% the total surge energy. This will leave only 11.11% of the strike energy to the equipment building perimeter ground. The perimeter should only have one interconnection to the tower base and should be just below the coax cable runs. For mountain tops, where no conductive soil exists and only radials can be used, wide copper strap, 38 mm to 76 mm wide, should be used to minimize inductance.

The re-bar in the concrete tower base should be used to augment the grounding system. Concrete is conductive because of retained moisture and alkalinity. Tower J bolts or anchor bolts embedded in a conductive concrete tower base will couple strike energy to the concrete. The surface area interface between bolt and concrete will conduct high current levels during a strike. If the ground system is not adequate, the current density could be high enough to cause arcing at the bolt/concrete interface. When the re-bar is interconnected with the bolts, there is additional surface area interface with the concrete, reducing current density. With more surface area and less current density, arcing in the concrete is less likely to occur. If the ground system is not adequate, the current density will be high enough to cause arcing at the bolts. By interconnecting the re-bar, the current density will be reduced and arcing will be less likely to occur. To learn more on designing with the rebar, consult the book, "The 'Grounds' for Lightning & EMP Protection", Second Edition.

It is not necessary to route a single copper ground wire up a large galvanized steel tower. The difference in resistance between copper and galvanised steel is lost when compared to the inductive voltage drop due to surface area (skin effect). Placing a lightning rod at the tower top and using the copper cable and tying it to ground is ineffective. The inductive voltage drop of the wire (>100 kV) will cause it to jump (arc) to the tower, unless it is at least 60 cm from the tower. In fact, the use of bare copper cable can cause a corrosion problem to the tower and should not be used unless covered. Copper should never come in contact with galvanized steel. Tinned copper wire should not be used in the ground together with copper ground rods since the tinning will be leached into the soil very quickly.

Increasing the distance between the tower and the coax cable entry provides additional propagational time for the tower ground to absorb the strike energy. At the building entry bulkhead panel, coax protectors should be used in addition to another set of coax grounding kits. This bulkhead panel should have ground connectors connecting it to the perimeter ground with the same circumferences as the combined circumferences of the coax cables. Tower lightning protectors should also be included and grounded at this same point.

In a P/G system design, one should also think of system noise reduction and EMI/RFI (Tempest) shielding. This can be accomplished with a single-point grounding system. Sometimes the use at a single ground bus (called the Principal Ground Window or PGW) can act as your single point. All your equipment chassis should be grounded to this bus. It should be a large surface area connection to the ground system such as a PolyPhaser Bulkhead Panel, PEEP or PER. Typically, the plasma column of the lightning strike (return stroke) can have a voltage rise time of 20 - 50 nanoseconds. If it hits a tower, the tower will handle the majority of the current pulse to ground. The tower will also radiate the HF energy of the strike. The near field (high magnetic or H field) will penetrate equipment interconnection wires and induce surge energy. A Faraday cage can reduce this energy. A halo ground system with multiple down-conductors to the outside perimeter ground loop can act as a quasi-Faraday cage and give some low frequency shielding. Properly bonded metal building panels can act as a more effective cage. Double-walled screen rooms offer the greatest isolation.

Tower flasher lines, both strobe and conventional, should have protectors to prevent surge entry into the building and the power lines, as well as nuisance damage to strobe PC boards.

To ensure survival of the building equipment, all inputs/outputs (I/Os) must have protection and they should all be ideally located at the principal ground window or bulkhead panel. If these I/Os (power, telco, etc.) enter elsewhere, protect them first at the entry point (ground protector to perimeter) next run to Perimeter Ground Window (PGW) then protect it again before distribution by the cable trays. (Note: All trays should be grounded to the PGW or bulkhead panel.)

Technical Editor's Note

Further information on this topic, covering Australian 'best practice', can be found in the Standards Australia publications listed below.

AS/NZS 1768:2003 *Lightning Protection*

AS 4262.1:1995 *Telecommunication Overvoltages – Protection of Persons*

AS 4262.2:1999 *Telecommunication Overvoltages – Protection of Equipment*

ar

2006 Callbook: *we need help!*

We have already started on the production of the next issue of the Callbook.

If you have any amendments which need to be made to the non-callsign information published in the 2005 issue, please let me have it ASAP.

For changes to the actual callsign information, make sure that any changes of detail reach the ACA before 30th June.

Also, we would be happy to receive photographs which may be suitable for the front cover.

E-mail to
callbook@wia.org.au
or by post to
Callbook PO Box 2175
Caulfield Junction 3161

Brenda VK3KT

Calling CQ CQ, this is VK5ZKT calling CQ and listening.....!

This is what may be heard if you happen to be tuning across the bands. Hello from VK5ZKT.

Karsten (Kas) Thole VK5ZKT
Email: karsten_thole@hotmail.com

I would like to take this opportunity to introduce myself and my radio shack to all amateur radio operators and shortwave listeners.

At the age of 13 I was becoming very interested in 27 MHz CB radio and 477 MHz UHF CB and the idea of playing around with radios. I saw a demo on amateur radio at the Perth Concert Hall on a school excursion and saw my first shortwave radio. I was AMAZED!!

I became more aware of electronics. The term "Amateur Radio" was new to me, and browsing through a copy of the 1995 Dick Smith Catalogue, I came across "amateur radio". I asked my Dad and he told me about it and how one could talk all around the world, and I was HOOKED!

I built a few electronics kits from Dick Smith and listened-in to shortwave stations on my first shortwave radio, a Toshiba. Then, a while later, I purchased a Sangean ATS 909, threw a wire antenna out the window and my shortwave listening began. The first stations I picked up included BBC London and VOA Voice of America. I was so amazed that this tiny radio, could "hear" these far away stations. I also listened into the amateur bands at night and heard many strange things, like 73, CQ, and HI. "What does this mean?" I have a chuckle when I think back to it all. I know exactly what it means now!

The family moved to Adelaide in 1998 and radios went to the wayside as I was settling into a new city. After a while I came across the North East Radio Club in Modbury and the bug bit once again.

I was finally licensed in 2001 with the call VK5HKT. Then I set to work putting up my first dual band antenna, the X-50 from Diamond Antennas, and borrowed a 2 m radio from Peter, the then President of NERC, formally VK5ZFW who was also my first contact on the 2 m FM band.

In 2003 I was granted an exemption from the full call theory once I graduated with the Certificate III in Electronic Engineering (Radio Frequency Communications). Once ACA approval took effect, I was granted the call VK5ZKT.

My current station consists of a FT-1000MP Mark V 200 W Transceiver, a fully restored Heathkit SB-101, restored by Keith VK5OQ who gave valuable time and effort in getting it working, thanks Keith. I also have a FT-817 5 W all mode all band backpack radio, an ICOM IC-207H which was a gift from my grandmother and 2 Philips FM-900 series FM-92s, one for 2 m FM and the other for 70 cm FM.

As far as antennas are concerned, I have a Hustler 5BTV 5 band trap vertical antenna for the 80, 40, 20, 15 and 10 m bands. The vertical trap antenna is in an elevated mount on the garage shed and the feed point is a further 4 inches higher, and I have a pair of ¼ wavelength radials made from 12 AWG wire for each of the bands. This antenna has given me superb DX results and local and interstate contacts. For receiving however, I use a ¼ wave (approx.) End Fed Zepp Long Wire antenna which is peaked on receive using an MFJ 969 Deluxe Versa Tuner II, as verticals tend to be a bit noisy on receive, due to the fact that the vertical is a omni-directional antenna, and the signal coming in cannot be focused as with a beam. That's why I use the horizontal antenna, for its superb noise reduction and directivity.

I fully encourage city and apartment dweller hams that live in deeds or council restricted areas, to try a vertical antenna. Even if you aren't fortunate enough to own a multi-band vertical, load up a ¼ wave section of piping, put down some radials (1/4 wave at the frequency of operation) and try it out. Refer to the *ARRL Antenna Book* or seek expert help before attempting any antenna project that uses RF currents. SAFETY FIRST!

So far from the 21/9/04 I have made 700 contacts with the vertical antenna using 100 W and less. My first DX contact was on 40 m to JQ2IQW in Japan using 20 W. I have worked the following DX- Russia, Japan, Ukraine, Britain, Ireland, Kuwait, Oman, Pakistan, India, Poland, France, Germany, China, Vietnam, and all of VKs, Island of Oland in the Baltic Sea, Papua New Guinea, New Zealand, Lord Howe Island, Korea, Japan, Italy, Norway, Saudi Arabia, Switzerland, Spain, Dominican Republic, South Africa, The Netherlands, Canary Islands, Denmark, Nashville TN in the US, New Hampshire US, Orkney Islands off the North Coast of Scotland in the North Sea, SW Islands of Singapore, Czech Republic and more.

So as you can see, great results with no big dipoles or fancy stacked arrays with 400 W or a linear amplifier, just a simple trap vertical running 100 W and less with ¼ wave radials in a suburban backyard. Believe me, it truly does work!

Best of luck with antennas and your DX endeavours. I hope to hear you all on the bands soon. Write or email me at the address shown if you have any questions, or would like further information. I can be looked up on www.qrz.com.

Best of 73 and good DX.

Kas

ar.

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

ection on our web page

Lutron

Hand Held Test & Measurement Instrumentation

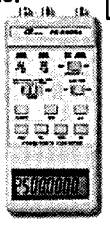
Many Lutron instruments are equipped with an RS232 data interface allowing you to connect them to your computer for data logging.

Model SL-4010 – Digital Sound Level Meter

FEATURES

- Large 3.5 Digit 18mm LCD Display
- Characteristic of "A" Frequency Weighing
- "Fast" Time Weighting Characteristic Mode
- Condenser Microphone for High Accuracy & Long Term Stability
- Measurement Hold Function
- Portable & Light Weight Design Allows for Single Hand Operation
- High Quality with Low Cost
- Strong ABS-Plastic Case Supplied as Standard

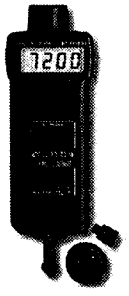
Model FC-2500A – Hand Held Frequency Counter



FEATURES

- Large 8 Digit LCD Display
- Wide Measurement Range to 2.5GHz.
- Hand held Pocket Size Instrument
- Frequency, Period & Relative Measurement
- Data Hold & Data Record Functions
- 0.1Hz min Resolution on 10MHz Range
- High Sensitivity to VHF & UHF Frequencies
- Carry Case Supplied as Standard

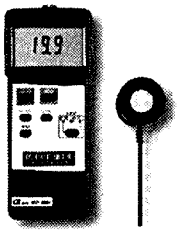
Model DT-2236 – Digital Photo/Contact Tachometer



FEATURES

- 5 Digit 10mm LCD Display
- Multi Functions Photo Tacho, Contact Tacho & Surface Speed Measurements in the one Instrument
- High Resolution, Accuracy & Repeatability
- Last Value/Max, Value/Min Function
- Wide Measurement Range (0.5 to 100,000 RPM)
- Portable, Light Weight
- Carry Case & Accessories as standard

Model UVA-365 - Digital UV Light Meter



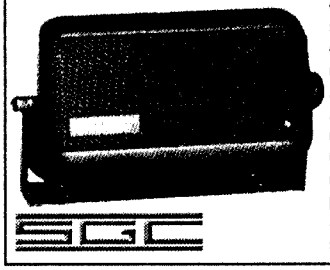
FEATURES

- Measures Long Wave 365mm UV Light
- Super Large LCD Display
- Wide Measurement Range
- Exclusive UV sensor with correction filter
- High Resolution, Accuracy & Repeatability
- Data Hold, Max & Min Functions
- RS232C Output
- Portable & Light Weight
- Carry Case Included

The Lutron UVA-365 Portable UV Light Meter is a professional instrument for the measurement of long wave 365mm ultra-violet radiation. Using microprocessor circuit the instruments provides fast accurate readings, with digital readability and the convenience of a remote probe.

Order your 450 ohm Ladder Line NOW

ADSP2 Speaker

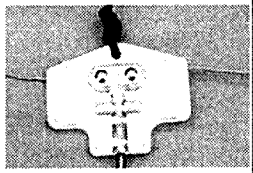


Works with the press of a button. You can select from three modes of operation: no noise reduction, the original ADSP, and the new ADSP2 noise reduction modes which provides up to 26 dB of noise reduction within the passband. The ADSP2 Speaker is "One Touch" simple to operate.

TEN-TEC

Ten-Tec model 3003 Acro-Bat antenna hanger.

Made from UV resistant polycarbonate plastic, as used by Power companies for covering outdoor electric power meters. Hammers won't break it. Hardware is stainless steel. Can suspend either a ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna. or ladder line with internal pegs. Internal screw connections solidly clamp the wire antenna to the coax or ladder line feedline itself Attach wire and coax to the screw terminals, and clamp the two sides together and you are ready to hoist your antenna. Easy hoisting. of wire antennas by rope.

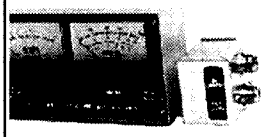


RF1 RF Analyst
(1.2 - 35 MHz)
SWR •True Impedance
RF Inductance &
Capacitance

RF5 VHF Analyst
(35 - 75 & 138 - 500+ MHz)
SWR • True Impedance (Z)
Automatically Finds
Minimum SWR or Z

VA1 Vector RX Analyst (0.5 - 32 MHz)
SWR • True Impedance
R and X Components • Series and Parallel
SIGN of X • RF Inductance and Capacitance
Other Advanced Features

NEW 300 metre range Wireless Vantage Pro Weather Station Released



WM1 Computing Deluxe Power/
SWR Meter
1.8 to 50 MHZ
Automatically Computes SWR
No Adjustments or Cross Needles
Peak or Average
1 watt to 2000 watts

We also have

- Function Generators • L, C and R Decade Boxes
- AC, DC and Temperature Calibrators
- Bench Power Supplies
- Pressure, Load and Position Sensors
- Data Logging Systems
- Complete Weather Stations

News from...

VK2 news

Compiled by Tim Mills

The Annual General Meeting of the NSW Division Company, as previously advised, will be held on Saturday 16th April 2005.

When nominations closed on 5th March, twelve nominations had been received for the nine positions. Also received were many agenda items. Ballot papers and the annual reports were posted out prior to Easter.

The Wireless Institute name has been associated with New South Wales since day one, now ninety five years ago. A meeting of concerned 'Experimenters' held at the Hotel Australia in Sydney, was reported during March 1910 in the 'Daily Telegraph' under the headline - A Wireless Enthusiasts Institute -. These 'Experimenters' were upset that the authorities were charging Three Guineas per annum for a license. That was a considerable sum of money in those days. In the 1915 - Year Book of Wireless Telegraphy and Telephony - there was a 'Wireless Societies' listing of - Wireless Institute of New South Wales - with Malcolm Perry as Secretary. There was a contact address of Box 2 at the King Street Post Office, Sydney, N S W.

It was 50 years last month since the Maitland floods, where many Amateurs were involved in providing valuable communications. The authorities recognized their contribution, when the NSW President Jim Corbin VK2YC, became the holder of an M B E award on their behalf. It is also 50 years since work started on acquiring and developing the VK2WI site at Dural. Round the same time, today's WICEN was formed. It started by being known as - CDEN - Civil Defence Emergency Network. It appeared that CD was too military in concept, so it was soon changed to WICEN.

The next exam based at Parramatta is scheduled to be held on Sunday 15th May. For details and application, contact the Parramatta office by telephone 9689 2417;

Fax 9633 1525; Mail to P. O. Box 9432, Harris Park, NSW 2150; or call in to the office at 109 Wigram Street on Tuesday, Thursday or Friday.

The Oxley Region ARC at Port Macquarie will hold their 30th annual Field Day on the long weekend - June 11th and 12th - at the Sea Scout hall in Buller Street. Field Day Coordinator is Bill VK2ZCW - Ph. 02 6581 0547 or the club email vk2bor@tsn.cc.

The recent work at VK2WI has enabled restoring the 2 metre morse training signal on 145.650 MHz. The 80 metre companion morse transmission on 3699 kHz is operating with a relocated antenna. The 80 metre signal is also used as a band indication. The 23 cm beacon has about 1 watt feeding the slot antenna, which was raised during the overhaul. Reports received indicate improved coverage. It was also possible to restore the 70 cm beacon after a temporary repair. The beacons for 6 and 2 metres remain out of service. They have to be replaced by a modern design. When this occurs, these and those on 70 and 23 cm will key in the CW mode, in place of the former FSK mode. This move will allow improved frequency stability and fit into the narrower allocations of the current band plan.

73 - Tim VK2ZTM.

Summerland Amateur Radio Club

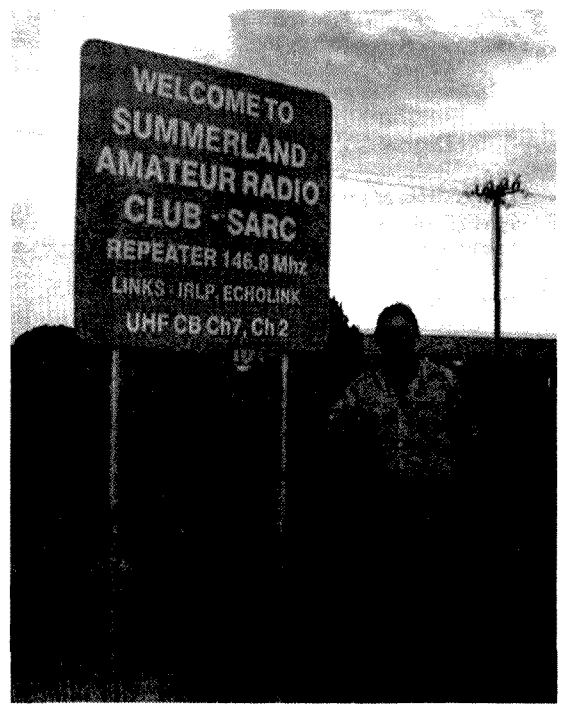
Club information

Summerland Amateur Radio Club. VK2SRC
Ph.: +61 02-66247247

Club:	412 Richmond Hill Rd Goonellabah, NSW. 2480	Email : vk2src@sarc.org.au Echolink: 174957 VK2RSC-R
Post:	PO Box 524 LISMORE, NSW., 2480, Australia.	Packet: VK2SRC-1@VK2YDN.#NE. NSW.AUST.OC IRLP Node 6220.

Page: http://www.nor.com.au/community/sarc
Location: Grid QG61QE 28.80 deg South, 153.57 deg East
Classifieds, free adverts: http://www.lom.com.au/Ham/classifieds/
Pics on - http://sarc.org.au/photo/

73, John Alcorn, VK2JWA, SARC14 - Treasurer, SARC.
Reply to - vk2jwa@sarc.org.au



The first Summerland ARC roadside sign on the Pacific Hwy, near Woodburn.

~WYONG~

~another very successful NSW Central Coast Field Day

The VK2 annual Central Coast Field Day was held on Sunday, February 20 and was as usual very well attended. Amateurs travelled from overseas and interstate as well as every corner of New South Wales to enjoy the camaraderie of the day and spend up big on all the bargains on sale.

The National WIA set up a stand on the first floor in the coffee lounge area, most of the WIA directors were in attendance. It seemed from the hectic pace that most of those attending the field day dropped in for a chat, to ask questions, make suggestions or join up.

~Want To Know More?

http://www.wia.org.au/news/2005/20050220-01.php

News from

Geelong Radio and Electronics Society (GRES) 2004

Rod Green VK3AYQ

The programme for 2004 was quite diversified, incorporating both educational and entertaining meeting nights. Members were given talks on a number of interesting topics. These included the mechanical operation of video recorders by David VK3ZDR. A representative from the Australian bar coding organisation spoke about bar coding of goods. He outlined methods of stock control using radio frequency identification. Another interesting talk was about paging systems. This included descriptions of personal pagers and how they had evolved to the present day. Doug VK3BHG, who is an airline pilot with QANTAS, gave a most informative talk about 747 airliners. This talk included statistical facts about the aircraft. He also explained how pilots navigate using great circle routes.

A number of instruction nights were held. Members were tutored in the use of 2 computer programs. The first was the CAD program "EAGLE". This program allows the user to draw a circuit diagram, design a PC board layout and get a hard copy of the design. The second program enabled the user to program a "Picaxe" microcontroller chip. A follow up to the Eagle program was instruction in printed circuit board manufacture for the home constructor. Another interesting evening was a showing of a videotape obtained from the WIA library. This was an overview of one of the VK5 2 m repeaters.

There were 3 visits during the year. The first was to the Ballarat Amateur Radio Group (BARG). While there we were given a talk on the construction of traps for wire antennas. The evening concluded with a hot supper. A visit to the QANTAS maintenance hanger at Avalon airport was arranged by Doug VK3BHG. Here we were shown a 747-300 aircraft that was being upgraded to a 747-400. During this upgrade the complete interior of the aircraft was to be replaced. This replacement also included all the avionics equipment. The final visit for the year was conducted by Bill VK3WJC. Bill is the operations/maintenance supervisor for "Omya Southern". This company grinds calcium carbonate, which among its many uses is used as a filler in paper. The factory runs around the clock 7 days per week. However it is only staffed for 8 hours per day 5 days a week. This is a modern state of the art manufacturing plant. All equipment is monitored and controlled by computer. Monitoring of the factory can either be done from the onsite control room, or from a remote computer connected via a telephone line.

While visiting the BARG we were shown their latest club project. This was a "screwdriver" antenna that covered all HF bands from 160 m to 10 m. This antenna is used for portable or mobile operation. After seeing this antenna it was decided that we would also build our own antennas. We have 16 being built at present. The Ballarat group has been most helpful giving us the benefit of their experience. These antennas will be of use to our members who either go on camping trips or are members of WIGEN.

In addition to the normal Thursday night meetings, the clubrooms are also open of a Wednesday morning. A small group of members meets to carry out work on the rooms. They also engage in other activities such as sorting out equipment to be put in our museum. Visitors to Geelong may like to visit this museum which is housed in the "Old Geelong Gaol". The gaol is open to the public on weekends and public holidays. It is located in Myers St. Geelong on the fringe of the CBD.

Club meetings are held every Thursday evening at 2000 hrs local time. The rooms are situated in High St. Belmont at the rear of the Belmont Community Youth Club. Visitors are always welcome.

VK4

BARCFEST 2005

The Brisbane Amateur Radio Club will be hosting its annual "Barcfest" on Saturday 7th May

This year there will be a new venue and a new starting time.

The venue is Mt Gravatt Bowls Club
1873 Logan Road
Upper Mt Gravatt.

Starting time is 10am

For further information and table bookings contact Les VK4ZLP

E mail **parkerlf@optusnet.com.au**

phone 07 3343 7247

mob 0413 377 045.

Hope to see you there on the day!

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

At the AGM in February this year we had some resignations from the committee and enough nominations to hold a ballot, which is a sign of a healthy club. There are a few changes to the committee, as a consequence.

Geoff VK5TY was re-elected as President and thanked the retiring members of the committee, in particular, Bryan VK5SV, the retiring Treasurer for his 18 years in that position.

The new Vice President is Jim VK5NB, the new Secretary is Leith VK5QH, the Treasurer is Hans VK5YX, and the committee members are John VK5EMI, Barry VK5ZBQ and Dale VK5DC.

Bryan's last duty as Treasurer had been to set the membership fees at $25 per year rebated to $20 if paid before April 30th.

Rob VK5RG then presented the members with a very clear explanation of the requirements for all radio amateurs to comply with the current Electromagnetic Radiation rules. He explained how to use the charts in the material available from the ACA on the matter of EMR, so that any amateur could ensure that their station and equipment did comply with the requirements.

It was a very informative and interesting talk. No general meeting was held due to the lateness of the hour.

All visiting amateurs are invited to join the AHARS on the third Thursday of each month.

Fleurieu Group Luncheon

Christine Taylor VK5CTY

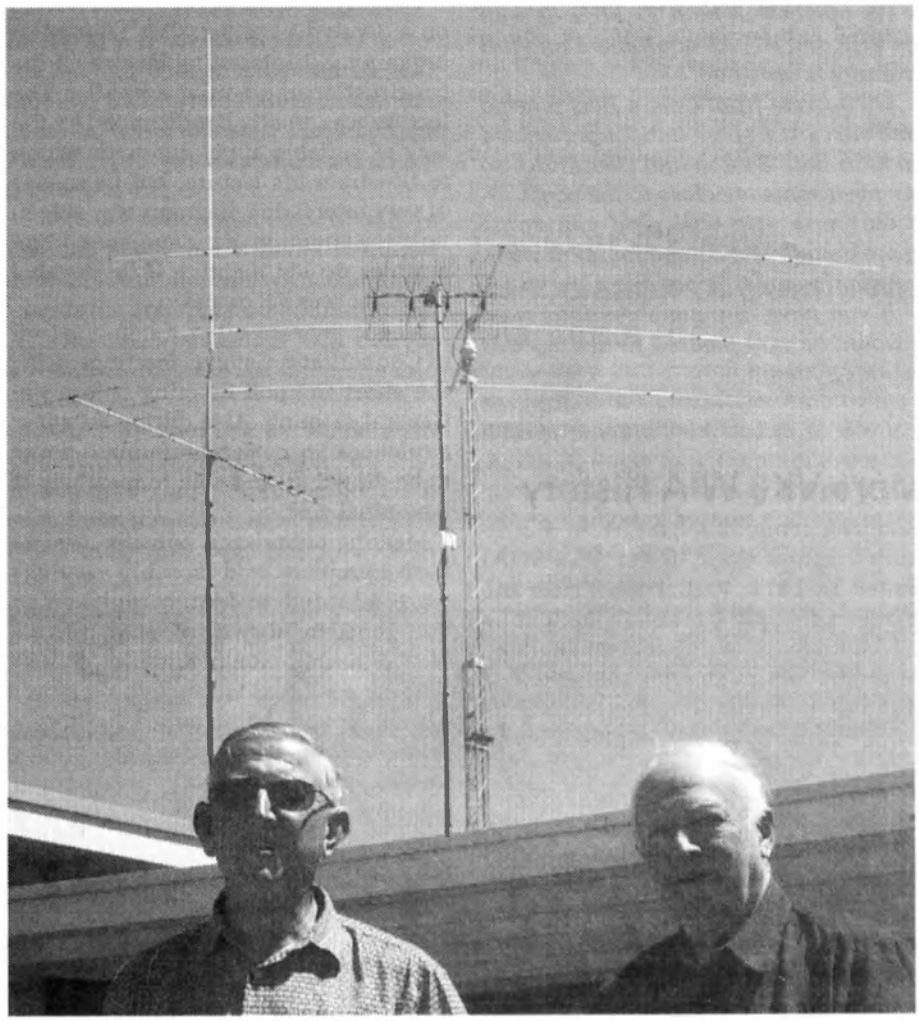
Graham VK5KGP again arranged a luncheon gathering of this group at Goolwa. 14 of us had a very pleasant lunch together then part of the group moved to the QTH of Garry VK5ZK, down on the riverfront for coffee and more talk.

The house was built by Garry's father long before the area became popular. It has a magnificent view across the lake with all its sailboats and the bridge across to Hindmarsh Island, so is a great place to enjoy with friends.

Th photo here shows Graham and Garry with some of Garry's aerials prominently in the view. Garry is active on many different bands and has knowledge of many different modes used by amateurs.

The diversity of the group that meets every three months reflects the interests of the permanent residents of the area because it includes people of many ages and interests. Some of the attendees speak to each other on regular skeds, others share interests in computers, packet radio or VHF. Some have worked and lived in the area and enjoy renewing friendships made then while some have childhood links with the Victor Harbour/Goolwa region.

It is an interesting group and there is never a lull in the conversations.



VK6 news

Will McGhie VK6UU
will2@iinet.net.au 08 9291 7165

Sea Rescue volunteers

The VK6 Advisory committee received the following request from the Volunteer Sea Rescue Group. Amateurs with some spare time may be interested.

My name is Roger Howell and I am the Commander of Whitfords Volunteer Sea Rescue Group (Inc.)

Our group is the largest volunteer based sea rescue group in Western Australia and we are in need of another radio home base station.

I write to you to ask if any of your members would be interested in joining our group and contribute to maintaining a radio watch with our existing three home bases.

We operate on both 27 MHz as well as VHF and HF. All equipment and full training is provided.

We operate from Ocean Reef marina and our existing base stations are located in Marmion, Beldon and Heathridge so we need someone close to the coast.

Our web site will give you some more details and can be found at www. whitfordssearescue.org.au

If you have any members interested I would be very pleased to discuss this matter in detail.

Regards
Roger Howell

More VK6 WIA History

Reading from the first W.A. Radio club minutes book, (later VK6 WIA) ended in 1921. Rather than rush the presentation this month's history is limited to 1921. Each year will be presented on succeeding months. It is difficult to gauge the interest in this history and whether VK6 notes should continue beyond the end of Book One, 1924. Getting local VK6 news is always difficult, so if you want more about VK6, you, the reader, have to do some writing from time to time.

The last meeting held at Perth Boys School was on 21st April 1921. There had been an offer of free meeting accommodation. A number of motions were passed, mostly local house keeping, such as the move of meeting venue. The location of the new venue was not mentioned. The next meeting was held at Stott's College followed by meetings at Warwick House. Agenda item 7 was "to advise Central Executive in regards to transmitting licences and to ask them what steps have been taken to procure same."

The first meeting at Warwick House on 20th June 1921 was addressed by the President, saying "all privileges enjoyed by amateurs at the present time were obtained through the Institute with hopes that the coming year would be marked by the beginning of better times for Radio enthusiasts."

The July meeting of 1921 had a lecture on a 3-valve amplifier. "Mr Middleton began a most interesting lecture on the construction of a 3-valve amplifier. The lecture was greatly handicapped by the lack of suitable apparatus with which to illustrate his lecture, but by means of very interesting diagrams was able to hold the attention of his audience." The minutes do not mention if the 3-valve amplifier was RF or audio.

Meetings were often a combination of Council and General meetings, with the short Council meeting before the General meeting. Also during this year a rulebook with useful information was to be drawn up and sold to members at a nominal cost.

Meeting attendance appears to have been a problem. Mid-monthly meetings were adopted in March, only to be questioned in July with a motion carried, "that if the mid-monthly meeting did not become a success within six months it should lapse." At the March meeting a motion was carried, "that each visitor be allowed to attend only one meeting per annum." One assumes that what was required at meetings was members rather than visitors.

At the September meeting two motions were carried: "that the Secretary be requested to write the Victorian branch re the deputation which was to approach the Prime Minister with regards to transmitting Licences", and, "that the mid-monthly meetings be discontinued." Discussed at this meeting was, "Were amateurs who used step-up transformers on spark coils without suitable choke coils causing oscillations to be transmitted over the mains?" The lecture was on "time", and agreed to be one of the most interesting delivered.

The 26 at the October meeting discussed transmitting licences for the Institute and a request to the Radio Department for licences. A question as to why radio frequency dead spots existed was put. The most probable reason suggested was geological formations. The lecture was on continuous wave transmissions.

The November meeting decided to cancel the December meeting with General meetings now to be held on the last Wednesday of each month, despite a previous motion to discontinue monthly meetings. It could just be my reading, or the minutes don't represent all of the discussion regarding holding meetings or not. However, reading ahead into 1922, meetings did continue on a monthly basis. The attendance at this meeting was 30, which is more than the numbers the VK6 WIA Division was averaging when meetings were discontinued a few years ago. To finish off the year, 1921, a lecture on electrical safety with, "a very interesting and spectacular demonstration of high frequency currents" was given.

So ends 1921, a time of spark transmitters and continuing attempts to obtain transmitting and receiving licenses. Anyone could build and operate a transmitter without any form of licence but radio enthusiasts wanted licences to regulate the growing interest.

I find the history fascinating. Instant communications did not exist except for the rare, expensive, limited telephone. It must have been an exciting time for anyone with an interest in radio communications. Any radio contact was new and almost everything was a first. And it was all home brew. Hope you enjoyed this step back into history with more next month.

VK7 news

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au Regional Web Site: www.reast.asn.au

Australian Optical Communications Record broken

On Saturday 19th February 2005 between 1100 and 1200 GMT, two way full duplex voice communication was established at 475 THz [630 nm] over a distance of 167.7 km [104 miles], between stations on the summits of Mount Wellington near Hobart in Southern Tasmania, and South Barrow near Launceston in Northern Tasmania.

The transmitters used were current modulated 1 W red Luxeon Lumileds with 200 mm diameter fresnel lenses and the receivers were BPW34 silicon diodes at the focus of a 250 x 200 mm fresnel lens and a FET input amplifier.

Signals going north were reported as 4/7 by Joe VK7JG, Jason VK7ZJA, Phil VK7JJ, David, VK6YA/7 and Chris Long on Mt Barrow. The signals received at Mt Wellington by Mike VK7MJ and Justin VK7TW on Mt Wellington were very noisy with readability to about 3/3 and two-way duplex voice contacts were completed.

This is certainly a record for Australian optical communications and possibly a world record for non-laser amateur communications. Congratulations to Mike and Chris this record has been a long time in the making. More info on the Regional website.

VK7 shines in the RD 2004

Congratulations to Martin, VK7GN for topping the VK7 HF Phone category with 373 and congrats to Richard, VK7ZBX who topped the VK7 VHF Phone category on 169. VK7 came second on the overall state ladder with a score of 1.077 and a HF QSO total of 1276 and a VHF QSO total of 1118 for 2004.

This means that our 2005 QSO benchmarks are HF 1507 and VHF 901. Thanks to all VK7 amateurs who participated and submitted logs. Lets make this year, the year we will take the old mugs off VK6!

BPL in VK7 – Aurora Energy's 2nd trial

The second trial is expected in May 2005. It will cover 1000 homes, and given the effort to install infrastructure if the trial proves successful it's unlikely to be taken out.

There is a substantial amount of fibre that has been and is being installed around Hobart and this will most likely provide the network feed points into the transmission system that will deliver the bandwidth to the last kilometre into homes.

REAST is looking to work with the National WIA BPL team to assist in whatever way is required with noise floor measurements, etc. A VK7 BPL Watch web page has now been established on the Regional website. Take a look and become informed!

North West Tasmania Amateur Radio Interest Group

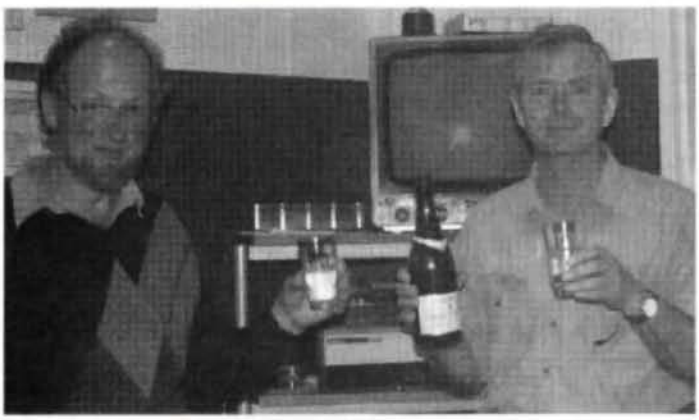
It's great news that radio amateurs in the North West of Tasmania have reformed as NWTARIG under the guidance of Tony, VK7AX. As reported a year ago in Amateur Radio magazine this group went into recess and has now emerging bigger and better!

Northern Tasmanian Amateur Radio Club

NTARC's March meeting was a very informative talk by Jason Reilly VK7ZJA, on the Optus Australia Cellular Phone Network with a focus on GSM and cellular technology. Thanks to Jason for a great talk.

Radio and Electronics Association of Southern Tasmania Inc.

Wednesday 2nd March saw about 20 people visit the Tasmanian Ambulance Service Headquarters thanks to Roger, VK7HRW. Roger is a Communications Operator with the service and he showed us the impressive system that they use to record and dispatch ambulances on a state-wide basis.



Chris and Mike Groth VK7MJ celebrating.

Roger VK7HRW at a control desk.

Technical abstracts

Peter Gibson VK3AZL

Improvements to the 2 metre copper loop

In Technical Abstracts in Amateur Radio for May 2004 we published a design for an all copper loop antenna for 2 metres. In Hints and Kinks in QST for October 2004, Dick Stroud, W9SR describes an improved feed for his previously published design.

The new feed eliminates forming the gamma match tube shape and deletes the shorting strap and its adjustment completely. The centre frequency can then be set by a simple adjustment of the end caps. If the VSWR is not very low after completion, the centre wire insulation is probably different from that on those antennas tested. If that is the case, change the wire length in 1/8 inch steps until the VSWR is minimum. All other design parameters remain the same. Figure 4 shows a drawing of the modified match.

The construction details are as follows.

Note 1 inch = 25.4 mm

1 Drill a ¼ inch hole on the centre-line of the elbow and tubing and 3/16 inch below the edge of the elbow. The gamma rod should then be spaced 9/16 inch from the OD of the lower antenna element, as shown. Place the ¼ inch gamma tube through the hole so that 4 15/16inch is exposed outside the elbow. The tube should not touch the back wall when inserted.

2 Solder the tube in place, with the gamma tube parallel with the lower element. Do not heat to the point that you loosen the elbow. Insert 6 inches of sleeving as far back as the element back wall. It should be exposed about 3/16 of an inch at the connector end of the tube.

3 Insert a 4 7/8 inch length of #16 vinyl covered wire and solder it to the coax connector centre pin. The length of this wire is critical and includes 1/8 inch excess, which is stripped for soldering to the connector. Both the rear of the connector and the exposed end of the gamma rod should be sealed against moisture.

ar

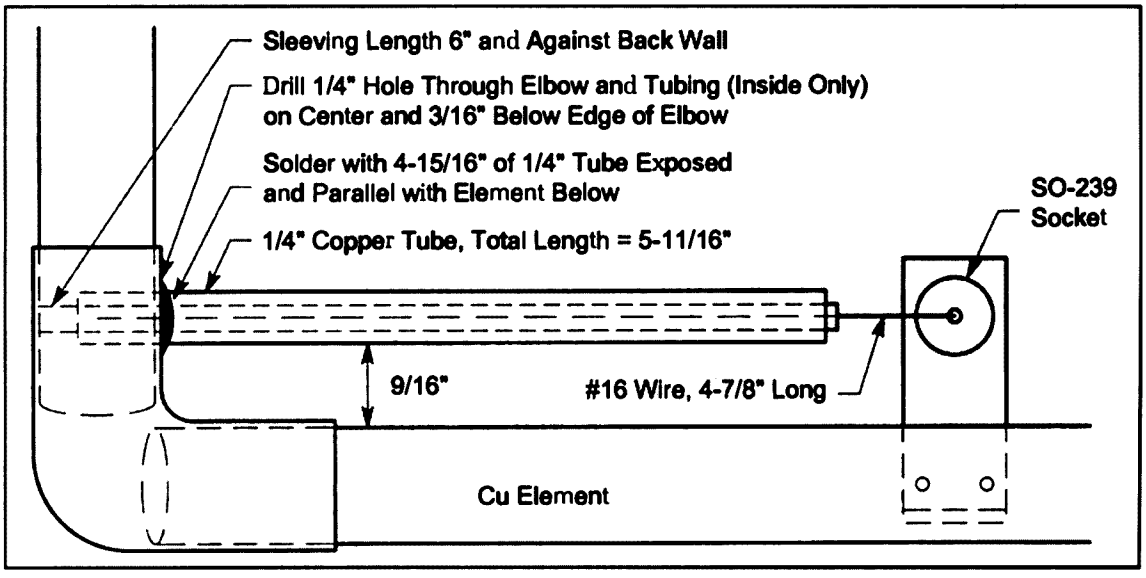


Figure 4. The modified gamma match assembly for the 2 meter copper loop antenna (AR May 2004) considerably simplifies the antenna assembly and adjustment by eliminating the gamma strap

News from VK7 *continued*

Roger demonstrated the computer aided dispatching system which allows the logging of locations of ambulances and units throughout the state, the system brings up 1:25,000 maps of the state for the operator to direct an ambulance crew, allocate priorities, actions and talk a caller through first aid/response techniques.

The radio communications network is shared with the Tasmanian Fire Service and is all low band VHF (78 MHz) equipment. There are mobile voting systems throughout the state providing coverage for most of the populated areas of the state. There is also heavy usage of a paging system similar to the Fire Service with most paramedics, ambulance officers and volunteers carrying text-based pagers. These pagers operate just above the amateur 2 m band.

A big thank you to Roger, Kaye and Toby for showing us around the control room.

Toby demonstrating the system to interested amateurs

ar

Christine Taylor VK5CTY

Annual General Meeting

The AGM will be held on the first Monday in May. Please be there. We are proud of the fact that we usually have a very good number of people call in. Let us make this year's AGM another memorable one.

By the time you see this column you will have your Newsletter so you will know there who the nominees for each position are and you will know if it there will need to be a vote. If so, make sure you are there so your vote is counted.

See you on 80 metres on May 2nd.

ALARAMEET

Our ALARAMEET Coordinator, Marilyn VK3DMS is delighted with the number of people who have sent in their "expression of interest" forms and we hope you can all be in Mildura for September 9th to 12th.

As we are reminding everyone. ALARA will be 30 years old at the end of July so we will be celebrating 30 years of love and friendship when we meet in Mildura. As it happens it is also almost exactly 21 years to the day from the date of the first ALARAMEET, also held in Mildura, another excuse to celebrate.

We are still hoping we will hear from some of those early YL members with whom we have lost contact. So if you were involved in the original planning and organisation of ALARA please write to someone or ring or contact by email, just to let us know how you are and what you are doing now.

I can be contacted on 08-8293-5615, or by email at geencee@picknowl.com.au. Marilyn is on email at vk3dms@wia.org.au or via the ALARAMEET website http://www.alara.org.au

For any other inquiries to do with arrangements or attendance at the ALARAMEET please use the website, too. There is information there about the program and much more.

Publicity about the ALARAMEET

If you have a Caravan and Camping Show in your town or city and you visit it, have a special look in the tourist section. Recently, Sue Mahony, and her OM Steve VK5AIM did just that and spotted in a brochure about Mildura, that the ALARAMEET was included in the "Events for September". Well done, Marilyn to alert the Tourist Bureau to our gathering and thanks to them for bringing radio amateurs to the notice of the public.

Special event station in Melbourne

If you missed it this year, don't forget it next year. There is a Special Event Station each year for you to contact. It is VK3GP and is part of the Grand Prix held in Melbourne in March each year.

This year, as usual Gwen VK3DYL and her friends of the Foothills Radio Club were rostered on to operate this station. Did you contact it? If so, don't forget to send your QSL card in. I am sure the one you got back will be an interesting one for your collection.

Gwen was not the only YL at the Grand Prix. Jenny Z from VK5 was also there as part of the St John Brigade, making sure there was first aid available for the thousands of people enjoying the car racing.

Congratulations to Christine WB2YBA

Christine received the Alma Dea Romani Renaissance Woman Award late last year, in recognition of her many years of dedication to medicine.

Christine was one of the first DX members of ALARA and was President of YLRL for many years. We would like to add our congratulations to those Christine has already received for this award.

Another YL DXpedition

Elizabeth VE7YL and Gwen VL3DYL will operate from Vanuatu in May. They will be in Port Vila from 2nd to 8th May then on to Aore Island (both IOTA OC-035) from 9th to 19th May. They will then move to Tonga (via Auckland) and operate from Nuku'alofa (IOTA OC-049), from 20th to 24th May and from Vava'u (IOTA OC-064) from 31st May to 8th June.

QSL will be direct to Gwen VK3DYL at 3 Gould Court, Mt Waverley 3149 with SASE or via the VK3 Buro.

Please keep them busy on CW and phone and please send your QSL card to Gwen for confirmation.

The Luncheons

Unfortunately VK3 have decided they will suspend their luncheons till further notice, the changes of venue and the distances some of the YLs have to travel has made it all too difficult. We hope this is only a temporary hitch.

The luncheons in Perth and Adelaide are continuing as usual. Please contact one of the locals if you are in either of these cities at any time for more information. It is pleasant to make or renew friendships with "foreigners" and the luncheons are a good informal way to do this.

ar

Christine Haycock receiving her award.

AMSAT

Bill Magnusson VK3JT

A welcome solution to the Keplerian Elements issue

At last it seems we have a solution to this vexing problem. The issue arose with a rather frightening announcement over a year ago. The "normal" methods of generating and distributing keplerian element data to amateur radio satellite operators would be discontinued. Now, this has the potential to create grave problems for all amateur space enthusiasts and indeed it has generated a huge amount of discussion on the BB. Various alternatives have been suggested and tried during the ensuing year. Some have offered a partial solution and others have been rejected for one reason or another. In the meantime some software writers are including routines in their latest versions to do the various manipulations automatically. Now it seems we are again in the debt of Dr Tom Kelso of "Celestrak" for a solution that will suit just about everyone. Early in March 2005, Dr Kelso released a free software package that completely automates the process. "TLERetriever" is easy to set up and will automatically download your specified keps from SpaceTrack. You will need an active SpaceTrack account. Having downloaded the zipped data "TLERetriever" will then, at the touch of a button, process the data to give you sets of "Celestrak" style elements for use in your tracking programs. The software is available from: http://www.celestrak.com/SpaceTrack/TLERetrieverHelp.asp

I have tried it out along with a number of my friends. It installs easily and works perfectly. The keplerian element sets it produces are checked for accuracy during processing and so far they have worked in the WiSP and InstantTrack programs that I use for satellite tracking and also in the visible satellites prediction program "SatSpy". The element sets seem to have the same validity as those which have previously been available from Celestrak. The program specifically addresses the thorny problem of differing satellite names. Indeed this is its most interesting feature. It looks like all the difficulties introduced by the changes in the structure of Space Command have been solved by this nice piece of software at the touch of a button. Thank you Dr Kelso!

While on the subject of forwarding Keplerian Elements.....

Efforts are being made to further clarify the long term situation regarding AMSAT's ability to continue to publish elements for amateur radio satellites on the web site and via the e-mail service. Contact is being maintained with Space Command concerning this possibility. The following information is from Ray Hoad, who provides the service for us and is copied from a recent ANS Bulletin. "I have been in e-mail contact with the new Air Force Space Command keplerian element web site concerning the transition from the old OIG web site. Air Force Space Command is currently considering how to administer the new web site. They have told me that no time line for a decision has been determined as yet. For the time being, I will wait their decision and I will keep you posted as I receive information. Patience is the keyword here."

AMSAT volunteer report

As one of his duties, Gunther Meisse, W8GSM, AMSAT Treasurer and Board Member has been compiling a yearly account of the monetary value of AMSAT's team of volunteers. He recently announced that the 2004 total "in-kind services" significantly topped 2003 amounts. In 2004, AMSAT volunteers documented services to the organization totalling $364,947. Details of the Volunteer Reporting System (VRS) are available on the AMSAT-NA web site. If you have the specific skills required and the time available you may like to register by clicking on the link "Becoming a Volunteer". Perhaps you already do contribute. If so Gunther would like to hear from you so your efforts could be recognised along with all other AMSAT volunteers. AMSAT is a volunteer organization and it's good to see those who freely give so effort and so much of their time receiving the recognition they deserve.

The AMSAT group in Australia.

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600 UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

AO-51 schedule page

Sorting out the operating schedule of AO-51 has always been a problem. The commissioning still continues and it may be some time before the schedule settles down completely. Due to the experimental nature of AO-51 it may never totally "settle down" at all. The group in charge of the AMSAT-NA web site have added a really nice new feature. It's called the AO-51 Schedule Page and is available from the home page. The data is presented in easy to understand graphical style and is kept up to date. Congratulations to the team. The regular AO-51 users will be very appreciative.

OSCAR-11 reaches its majority!

OSCAR-11 achieved 21 years in orbit on 01 March 2005. It's still working and sending reliable telemetry on its VHF beacon. Congratulations to Professor Sir Martin Sweeting G3YJO and his team for this fine achievement. How much equipment in your radio shack is still operating after 21 years? Remember too that your gear sits on your operating bench or at most resides on a mast in your backyard. OSCAR-11 has been doing it all in the somewhat harsher climate of "space". In the latest of his regular "UO-11 reports", Clive G3CWV tells how during the period 15 February to 09 March 2005 reliable signals have been received from the 145.826 MHz. beacon, transmitting continuous ASCII telemetry from 25 February to 06 March. The beacon operates under control of the watchdog timer. Observations have indicated that the cycle is approximately 10.3 days ON followed by 10.4 days OFF. Assuming that this cycle continues, the beacon should switch ON again around 17 March. For a nostalgic look back into the past, why not track UO-11 and listen to the beacon - and remember it's been beeping away like that, keeping us informed of its condition for all of 21 years!

New "S" band downconverter features dual IF output frequencies.

I hope to be able to report more on this next month. A company called "Keps" has announced this device which it calls the 13LNC72-DB. I have yet to receive any reports of its performance in real life but the specs read well. Its main claim to fame is the availability of output frequencies in the 2 m and 70 cm bands. This feature alone would make it worth considering. It gives the operator a wider choice of equipment configurations in the shack.

ar

Plan ahead

2005 Wadda Cup Contest

24 September, 2005

SSETI Express update

March 2005

Graham Shirville G3VZV

SSETI Express is the first of a series of satellites being developed by the Education Office of ESA – The European Space Agency as part of the "Student Space Exploration & Technology Initiative"

The satellite is quite large – 600x600x700mm and will weigh in at more than 50kg.

It is being built by university students from a number of teams from all across Europe and being assembled at the ESA ESTEC facility in the Netherlands.

The satellite is set for launch on a Cosmos rocket later this year with a number of other satellites into a sun synchronous 98° 680km orbit from Plesetsk in Russia.

The payloads

There is an OBC, an attitude control system, a colour camera and cold gas thrusters on board as well as three cubesats which Express will "launch" soon after it separates from the launcher itself. All of these systems need to communicate with the ground both for tele-command uplink and for telemetry downlink purposes.

The Communications Suite

The main data transceiver is a UHF unit built by Holger Eckardt DF2FQ. It is based on his existing TF7 packet transceiver but the unit includes a 9k6 TNC and has its own switch mode power supply.

Originally this was going to be the only communications device being flown but there is also a set of experiment S band patch antennas being flown and they needed a transmitter to power them. To start with this was also going be a full data transceiver but the costs for a commercial unit made this option "non viable".

This gave AMSAT-UK the opportunity to offer a 3 watt S band transmitter free of charge to the project - on the basis that it could be linked to the UHF receiver for operation as a single channel FM voice transponder when all the experiments have been completed. The unit also incorporates its own switch mode power supply and a 38k4 TNC to allow the rapid downlinking of data – especially necessary for the camera experiment.

We were also fortunate that Jean Louis F6AGR from AMSAT-F was able to facilitate the frequency notification ITU process for the mission. Without his help I believe it would have been very difficult.

The S band transmitter progress

The transmitter unit is built into a beautifully machined and finished aluminium box provided by the University of Wroclaw who have also developed the three way power splitter and the experimental patch antennas.

Except for the TNC, which is a commercial TNC 7, the whole unit has been designed and built from scratch by the team. There are five boards. The exciter from Sam G4DDK, the PSU from David G0MRF, the command & control board and the sensor board from Jason G7OCD and the 3W PA from Charlie G3WDG (an identical unit to that flying in AO51)

The unit was first "delivered" to ESTEC early in November 2004 but further work on the wiring was needed and it was then returned to them again at the end of the month. At this stage the first actual amateur call was put through the satellite in the clean-room from the "control room" next door.

The unit then remained at ESTEC and was regularly exercised to download data via the temporary ground station that had been provided to them by Howard G6LVB.

During February it became clear that the data rate from the OBC to the TNC needed to be changed to accommodate other mission requirements. An AMSAT team went over to rewire and reconfigure the unit and success was quickly achieved.

We then went on to apply the conformal coating to all the PCBs (except around the RF parts). At this stage disaster struck as the somehow some of the coating found its way right inside one of the filter assemblies – result no RF output!

The unit was then brought back to the

UK for "repair" but quickly returned again during the first week of March by Sam and David.

They were able to demonstrate the unit working again and also helped the SSETI team solve a power limiting problem which caused the unit to be switched off for 150ms every time it was commanded on – not helpful when trying to transmit short packets.

Here is an extract from part of the SSETI Express Integration logbook for 2nd March 2005:

ESA_Neil, AMS_David and AMS_Sam power up the OBC, UHF and S-BAND for the purposes of testing.

- The initial power consumption of S-Band FM seems good
- The carrier is brought up successfully with the usual command
- The DTMF telemetry is turned on and received without issue
- The unit is switched to data config and data is transmitted without issue
- The carrier is brought back down
- The DTMF telemetry is turned on and received without issue
- The unit is switched to data config and data is transmitted without issue
- Transponding is tested without issue

MILESTONE 25: The S-Band sub-system is declared flight-ready.

Actually the S band transmitter is the FIRST sub-system to be declared flight-ready!

It has been a great experience for the AMSAT-UK team to be working with both the ESA experts and also the enthusiastic students – a number of whom have expressed the intention to get an amateur licence for themselves! It is a steep learning curve for them and for us - although we have been flattered in one presentation recently given by Neil Melville – the Project manager, which includes the text "Radio amateurs know what they are talking about"

What happens next?

A total of 150 solar cells, in ten strings of 15, are currently being laid onto the external panels of the satellite and we anticipate that these should be sufficient to enable the U/S transponder to work with the carrier up on a near 24/7 basis.

The flight model of the satellite will be completed over the next few weeks and will be subjected to the usual vibration tests and also thermal vacuum tests. Hopefully these tests will be completed without incident or problem.

The launch date is still not confirmed but should be late this summer.

The SSETI team will be providing full telemetry decoding information and will be encouraging us to provide downlinked telemetry data for them from around the world. They only have two ground stations of their own available and the software does not provide the "whole orbit data" that we are used to. Our worldwide network is certainly a unique facility and this data collection exercise will be good PR for the amateur satellite movement. ESA will be providing a prize for the amateur who provides them with the most. Full details will be available on the sseti website well before launch.

It is expected that the on board experiments should be completed within a matter of a couple of months from launch and after that the transponder can be placed into service. There is still a long way to go before that happy state becomes a reality and we have to remember that this is a high risk project – but if we don't try.....

References:

Full information about the project is available at the regularly updated www.sseti.net website. This includes the complete integration logbook mentioned above. It is a big file but makes very good reading for satellite enthusiasts!

The webcam: http://sseti.gte.tuwien.ac.at/WSW4/express4.htm

Downloads: http://sseti.gte.tuwien.ac.at/WSW4/express_downloads.htm

Space Colloquium

Members of the AMSAT-UK team who produced the S Band transmitter will be giving a presentation on SSETI Express at the AMSAT-UK Space Colloquium. This will be held at the University of Surrey in Guildford from 29 – 31st July. All Radio Amateurs and SWL's are welcome to attend the event. For further details contact the secretary Jim Heck G3WGM

Tel: +44 1258 453959
Email: g3wgm@amsat.org
Website: http://www.uk.amsat.org/

ar

See pictures inside back cover

WIA welcomes new members

February

Stanley R Aldridge VK4MFA
Christopher J Andrews VK4KAE
D Apted VK7DA
John G Badcock VK5ZAP
John Barnhill ZL2TCN
Dennis Bauer VK4MHQ
J Bazley VK4OQ
Raymond A Bell VK2BEL
Richard Benfatto VK2CRB
John D Britton VK2ZJB
Malcolm J Brotherton VK2HSV
Richard J Burden VK6TT
Jamie G C Campbell VK2YCJ
Ross Carter VK2SS
Ray Chalmers VK2VA
Lennart Christensen VK2BLZ
Carl N W Curwell ZS6BEX
Leonard C Daley VK2ZFD
Graeme M Dowse VK2CAG
James W Duggan VK7SM
Will Duncan VK2HWJ
Bryon Dunkley-smith VK3YFL
John Elliott VK3CVF
Mark W Forsyth VK3ZMF
Adam Gardiner VK2YAG
Richard Gibson VK4YA
Graeme Greenwood VK2ZIS
Robert P Gupry VK4ZL
Mark A L Hadfield L60443
Brett Hazell VK2CBH
J J Hehir L21224
Gordon J Heyes VK2PO
Colin Hinxman VK4ACH
Dennis E Hosken VK3ZLY
Greg Kelly L21225
Lloyd Kubis VK4ERQ
John Kuiters VK2ZJK
Peter Kutas VK2UPK
Ian Lloyd VK3IDL
Wayne Lonergan VK2HWL
Roy Longworth W9QM
Shane Magrath VK2KEP
Alan Meek VK4WR
Timothy Molyneux VK4OKH
Binu G Naikaraparambil VK2BNG
Alwyn M Nelson VK2DDZ
Jorgen Nordqvist L41087
David Oates VK5ADO
Thomas H G Oettle L21223
Craig Pattison VK2BTQ
Alan Peake VK2TWB
Steve Pettet VK2KSP
Gary Ryan VK2ZKT
James W Sanderson VK1BF
Cj Taylor VK2HEX
Dj Taylor VK2TDT
Stephen Teudt VK2TXQ
Steven R Tregear VK3TSR
Koen Van Den Beld VK2ZHA
Matthew Vaughan L50377
Michael M Wimborne J.p. VK3AUR

continued on page 49

Ian Godsil VK3JS

Contest Calendar April - June 2005

April	2/3	SP DX Contest	(CW/SSB)
	2/3	EA WW RTTY Contest	
	9/10	Japan Intl. DX Contest	(CW)
	16	Holyland DX Contest	(CW/SSB)
	16	TARA Skirmish Digital Prefix Contest	(PSK)
	23	Harry Angel Sprint	(CW/SSB)
	23/24	SP DX RTTY Contest	
	23/24	Helvetia Contest	(CW/SSB)
May	7/8	ARI Intl. DX Contest	(CW/SSB/RTTY)
	14/15	CQ-M Intl. DX Contest	(CW/SSB)
	21	VK/trans-Tasman 80m Phone Contest	
	21/22	Baltic Contest	(CW/SSB)
	21/22	King of Spain Contest	(CW)
	28/29	CQ WW WPX Contest	(CW)
June	4	VK/trans-Tasman 80m CW Contest	
	11	ANARTS WW RTTY Contest	(Digi)
	11	Portugal Day DX Contest	(SSB)
	11/12	South America CW Contest	
	11	Asia-Pacific Sprint Contest	(SSB)
	18/19	All Asian DX Contest	(CW)
	25/26	Marconi Memorial HF Contest	(CW)

Greetings to all contesters

Please find below details of two important VK contests. Both of these events are worth supporting for a variety of reasons. Please make a point of joining in this year. They are all on Saturday nights, so it should be possible to spare some time for your radio hobby.

Log Submissions can be a chore that many of us do not like; but they are part of the business of participating in a contest.

Today, most operators use logging programmes and they immediately take away the "chore" aspect, because there is built into the programme a self-scoring and submission sub-programme. This means, in fact, that if a contestant wants to, he can finish his contest and within 10 minutes have prepared and sent via email his log for that event. There are operators in VK and ZL who do just that! This way the whole event is over and the op. is free to prepare for the next occasion.

If this seems brutal, there is still no reason why a log cannot be prepared at a later date; BUT, the problem there is that the later date is often deferred, sometimes until well after the closing date stipulated in the rules. If that happens, the results are:

1. the contestant may well be omitted from the list for that year;
2. he will feel annoyed and neglected and not inclined to participate again;
3. the Contest Manager has to decide whether to include the entry or not, also at the risk of losing favour with those who did not send late entries.

It is only fair to ask that all who participate in a contest make every effort to have their entries in on, or preferably before, the closing date for that event. Contest Managers have lives to lead also, so they too rely on computerised calculations to get results out quickly.

Please be vigilant about this this year and don't let it stop you from enjoying the event!

73 and good contesting,

Ian Godsil VK3JS

Plan Ahead

Oxley Region Amateur Radio Club Inc.
Port Macquarie
30TH ANNIVERSARY FIELD DAYS
Queen's Birthday Weekend
11th & 12th June 2005

Rules 2005 VK/trans-Tasman Contests

Helpful Hint (particularly regarding "Scoring"):

These rules cover a variety of operator circumstances, so jot down or highlight only those parts that are applicable to you.

Contest dates

80 m Phone(Cat 1, 2 and 5)
Saturday 21st MAY

80 m CW(Cat 3 and 4)
Saturday 4th JUNE

160 m Phone(Cat 6, and 7)
Saturday 9th JULY

160 m CW(Cat 8)
Saturday 23rd JULY

Time

0800 UTC to 1400 UTC (in 6 one-hour stages).

Note: Best 5 hours to count (refer "Scoring").

Aims of contest

a). to provide a reasonably short event that doesn't impose too much on family life or sleep time, while giving 6 hours of constant on-air activity.

- to have a format suitable for both the serious and the novice Contestor, with a friendly and relaxing atmosphere.

b). to have a fair scoring system that:

- compensates for geographical location, usable band time and the difference in participation numbers between VKs and ZLs to provide, so far as is possible, a level playing field for all.
- places the main emphasis on VK/ZL contacts, by awarding bonus points for "trans-Tasman" contacts.
- provides incentive for the clever Operator, by awarding additional bonus points for working groups of "call-prefixes" in any hourly segment.

c). to promote/ give recognition to QRP operators and SWLs.

General

a). The Contest is open only to all VK and ZL call-signs.

b). The Contest shall be in 6 X 1 hour stages, and stations can only be reworked after the commencement of each hour.

However, stations worked during the 5 minutes before the hour cannot be reworked until 5 minutes after the hour.

c). Sequential numbers, commencing at 001, shall be given and received for all contacts made during the Contest.

(Use of RST numerals is NOT required).

Note:

Contest details: Rules, a suitable log sheet, and auto-scoring logging programs are available on the Contest web-site: http://home.iprimus.com.au/vktasman

Any queries or constructive criticism should be attached to the Log or emailed to: vktasman@hotmail.com

Bands:

80 metre band (May Phone/June CW)

160 metre band (July Phone/CW)

Frequencies:

80 m Phone: 3.535 to 3.625 MHz

80 m CW: 3.500 to 3.550 MHz

160 m Phone: 1.835 to 1.875 MHz

160 m CW: 1.810 to 1.840 MHz

Notes:

It is not in the spirit of the Contest to "park" on a frequency. While this will not be policed, 20 minutes is considered to be the maximum time between QSYs.

It is not in the spirit of the Contest to make contacts with another station at the same QTH, or in the immediate vicinity there-of.

Modes: LSB (DSB optional for QRP), CW.

Max. TX Power LSB: 100 watts pep. (QRP 5 watts pep, LSB or DSB) CW: 100 watts pz. (QRP 5 watts pz).

Categories:

Cat 1. Single Operator 80 m Phone

Cat 2. Single Operator 80 m QRP Phone (Also eligible to enter Cat 1)

Cat 3. Single Operator 80 m CW

Cat 4. Single Operator 80 m QRP/CW (Also eligible to enter Cat 3)

Cat 5. Shortwave Listener 80 m SWL

Cat 6. Single Operator 160 m Phone

Cat 7. Single Operator 160 m QRP Phone (Also eligible to enter Cat 6)

Cat 8. Single Operator 160 m CW

Note: no separate Category for 160 m QRP CW.

Multi- Operator

a). Club/Group stations shall be permitted to enter any Category, on the proviso that only ONE Operator is used during each 1-hour segment to perform ALL functions without assistance. (ie: TX/RX; log and time-keeping). - 2 to 6 Operators may be used.

b). Club/Group stations must score at least 100 points more than a Single-Operator station to have outright claim to any prize (including a VK/trans-Tasman Trophy).

If the leading margin is less than 100, Certificate(s) will be shared equally with the Single-Operator station, but the Trophy will be awarded to the Single-Operator station only.

Call-signs

a). VK4s north of the Tropic of Capricorn shall add "Central" after the suffix of their callsign for all contacts.

b). QRP/Phone stations shall add "Quebec" after the suffix of their callsigns for all contacts.

c). QRP/CW stations shall add "/Q" after the suffix of their call-signs, for all contacts.

Scoring

a). The final score shall be the sum of the five (5) highest scoring hourly segments, with the lowest scoring hourly segment not counted.

Note:

This gives the ZLs the option of working only 5 hours, if they choose not to stay up until 2am to try and improve their score.

It gives VK's (who have only 3 hours competition after 7pm), 5 hrs to complete a full Log, if they choose not to start until 5pm to avoid poor propagation at the start of the Contest.

b). VK shall be divided into 3 zones (for scoring purposes):

"East" VK1, VK2, VK3, VK4 (south of Tropic of Capricorn) VK7 and VK9

"Central" VK4 (north of Tropic of Capricorn); VK5 and VK8

"West" VK6 and VK0

c). VK to VK - except VK (East) to VK (West) = 3 pts

VK (East) to VK (West)= 3pts + 3 (distance)= 6 pts

VK (East) to ZL= 5 (distance) +1 (band time) + 5 (bonus)= 11 pts

VK (Central) to ZL = 7 (distance) + 2 (band time) + 5 (bonus)= 14 pts

VK (West) to ZL= 10 (distance) + 3 (band time) + 5 (bonus)= 18 pts

d). ZL to ZL = 3 pts

ZL to VK (East) = 5 (distance) + 5 (bonus) = 10 pts

ZL to VK (Central) = 7 (distance) + 5 (bonus) = 12 pts

ZL to VK (West)= 10 (distance) + 5 (bonus) = 15 pts

(ie: 5 bonus points awarded for each trans-Tasman contact)

e). During each 1 hour segment, additional bonus points shall be awarded as follows:

VK working 4 X VK call prefixes - each group = 20 bonus pts

VK (East) working 3 X ZL call prefixes - each group = 30 bonus pts

VK (Central)working 3 X ZL call prefixes - each group = 40 bonus pts

VK (West)working 2 X ZL call prefixes - each group = 35 bonus pts

ZL working 3 X ZL call prefixes - each group = 18 bonus pts

ZL working 3 X VK (East) call prefixes - each group= 30 bonus pts

ZL working 2 X VK call prefixes from

VK (Central and/or West) - each group = 30 bonus pts

Notes:

"Call Prefixes" are identified by the numeral in the call-sign prefix, (except when over-ridden by a "portable" or "mobile" addendum to the suffix, that indicates operation outside the "home" call area).

eg: VK3RX port5, and VK4TZ mob5, would both be regarded as VK5s.

"Groups" - each prefix numeral can be used only once in each "group".

- each call-sign can be used only once in a group per hourly segment.

Typical examples:

(VK2 + VK3 + VK7) = a "3 X VK (East) group".

(ZL1+ ZL3 + ZL4) = a "3 X ZL group"

(VK4/Central + VK6)

or (VK6 + VK8)

or (VK5 + VK6), etc.... = a "2 X VK (Central and/or West) group" (applies only to ZLs).

If more than one required "group" of call prefixes is worked in any hourly segment, bonus points are awarded for each "group".

(eg: VK/East working 3 X ZL call prefixes, twice in one hour = 2 X 30 = 60 pts).

VK working 4 X VK call prefixes four times in one hour = 4 X 20 = 80 pts).

Help? Download sample scored log sheet from Contest web-site, or use the auto-scoring computer Logger (ref Home-page menu).

f). Base station to QRP = 2 bonus points to each station.

QRP to Base Station = 2 bonus points to each station.

QRP to QRP Station = 4 bonus points to each station.

QRP using personally home-brewed RX & TX equipment (incl. kits)= 1 bonus point per contact.

g) SWLs:

To score, the callsigns and contact numbers of both stations in a QSO must be received and logged.

SWL stations shall score as for Amateur stations, except that scores shall be calculated for both stations in each QSO.

Notwithstanding that, as with Amateur stations, each call-sign shall be scored once only in each hourly segment. (This also applies when calculating scores for "call-prefix groups".)

Note:

"Participation Factor"- (to be applied by Contest Manager):

The number of participants on either side of the Tasman has a direct effect on the ability to score points from "across the Tasman", - a compensating factor shall therefore be applied in each mode Category, to all "trans-Tasman" contact points (not call prefix groups bonus points), scored by the Country with the lowest number of participants.

The factor is the "lowest number of participants" divided by the "highest number of participants" - ("participants" being the total number of stations compiled from all Logs received, in any one mode Category).

eg: 50 ZLs divided by 150 VKs = compensating factor 0.33.

- All ZLs "trans-Tasman" points X 0.33.

Logs

Note:

Log sheets can be downloaded from the Contest web-site.

Written Logs can posted, or may be scanned and emailed.

Computer logging systems (providing information as below) can be emailed.

a). A separate Log shall be submitted for each Category entered, except that QRP Logs may be used for other eligible Categories.

b). A new log sheet shall be used at the commencement of each hourly segment. Number each Log sheet (eg: 2 of 6).

c). For each contact, logs shall record call-sign of station worked; numbers given and received; UTC time (10 hrs behind EAST).

To the right, leave columns for "contact" points.

At the bottom, provide space to record hourly "contact" sub-total, bonus point sub-total, and "hourly" total (calculate scores after the Contest).

d). If six (6) hours are contested, the Log sheet for the lowest-scoring hourly segment shall still be submitted for cross-checking, but shall be indicated as "not included in final score" by writing "LOWEST SCORING HOUR" on top of the relevant page(s).

e). Logs, or log entries that are not clearly legible, in the opinion of the Contest Manager, or which are lacking the required information (including scoring and a Log

Summary), may be included in the Results, at the discretion of the Contest Manager, but will be ineligible for prizes.

Note:

Entrants are requested to take the time to submit a proper Log, rather than a "Check-log", which serves little or no purpose, and does not support the viability of the Contest.

Log Summary

a). Logs shall include a Log Summary, showing:

Name; Phone number (optional); Address; Category(s) entered;

Email address (if available); Total points score claimed.

b). VK4s in "Central" zone shall identify as such at the top of their Log Summary sheet by writing "Central" after their call-sign suffix.

c). QRP stations claiming points for "personally home-brewed" TX and RX equipment (incl. kits), shall indicate accordingly on their Log Summary, to qualify for "home-brew" bonus points.

d). Multi-operator entries shall identify as such after their call-sign in their Log Summary, eg: VK7DF (Multi).

It will be assumed that all entrants submitting a log will have contested in compliance with the Rules and in the "spirit of the Contest" (unless determined otherwise by the Contest Manager).

No written declaration is required.

Lodgement of Logs

a). Logs must be received either by post, to:

VK/ trans-Tasman Contest,
28 Crampton Crescent,
Rosanna, VIC. 3084
AUSTRALIA.

or by email to:

vktasman@hotmail.com

in either

"Word doc", "Excel", or scanned hand-written (if legible).

Use "text file/Notepad" only if above formats are not available.

b). Closing Dates for receipt of Logs shall be at 0700 UTC on

17th June, 2005 (80 m Phone/SWL)
1st July, 2005 (80 m CW)
5th August, 2005 (160 m Phone)
19th August, 2005 (160 m CW)

Note

Operators are requested to submit their logs even if you have a low score and don't think you will win. This will justify the effort and expense involved by the Contest Manager and ensure the on-going success of the Contest.

Awards:

VK/trans-Tasman 80M Trophy:

Highest Log score submitted in any one 80 m Category - (ref Multi-operator Rule)

Certificate 80 metres 1st Phone
Certificate 80 metres 2nd Phone
Certificate 80 metres 3rd Phone
Certificate 80 metres 1st QRP/Phone
Certificate 80 metres 1st CW
Certificate 80 metres 2nd CW
Certificate 80 metres 3rd CW
Certificate 80 metres 1st QRP/CW
Certificate 80 metres 1st VK
Certificate 80 metres 1st ZL
Certificate 80 metres 1st SWL
Certificate 80 metres (Night-owl's award) Top Phone score in 6th hour
Certificate 80 metres (Paddle-pumper's award) Top CW score in 6th hour
Certificate 80 metres (Wooden Spoon award) Lowest Log score submitted

VK/trans-Tasman 160 m Trophy:

Highest Log score submitted in any one 160 m Category - (ref Multi-operator Rule)

Certificate 160 metres 1st Phone
Certificate 160 metres 2nd Phone
Certificate 160 metres 3rd Phone
Certificate 160 metres 1st QRP / Phone
Certificate 160 metres 1st CW
Certificate 160 metres 2nd CW
Certificate 160 metres 3rd CW
Certificate 160 metres 1st VK or ZL (if not the Trophy winner)

Publication of Rules and Results

a). Rules will be published on the Contest web-site:

http://home.iprimus.com.au/vktasman.

There are links to this site on the:

www.wia.org.au WIA Federal web-site and most VK State web-sites
www.nzart.org.nz NZART web-site
www.vk4dx.net Contest web-site

Rules may be published in "AR" and "Break-in" magazines.

b). Results will be published on the Contest web-site

and links there-to, by the following dates:

80 m Phone and SWL - 22nd June 2005
80 m CW -- 6th July 2005
80 m overall results/prize-winners 6th July 2005
160 m Phone - 10th August 2005
160 m CW -- 24th August 2005
160 m overall results/prize-winners 24th August 2005

Results will also be published in "AR" and "Break-in" magazines.

Harry Angel Memorial Sprint

1000Z – 1146Z

Saturday 23 April, 2005

This an annual Contest to remember VK's oldest licensed operator, Harry Angel. Please note the time length of the Contest - 106 minutes, Harry's age when he died in 1998. It is open to all HF operators.

Object is to make as many contacts as possible on band 80 metres, using modes CW and SSB. Categories: Single Operator (CW, Phone, Mixed) and SWL. Frequencies: CW: 3500 - 3535 kHz, Phone: 3535 - 3700 kHz. Contacts in DX window not permitted. Exchange RS(T) and serial number starting at 001.

Score two points per CW QSO and one point per Phone QSO.

Stations may be worked once only per mode. Logs must show time UTC, callsign worked (both callsigns for SWLs), mode, RS(T), serial numbers sent and received for each QSO. Send summary sheet showing name and date of Contest, name and callsign of entrant, category entered, address, points claimed and a signed declaration that the rules and spirit of the Contest were observed. Send logs to Harry Angel Sprint, 363 Nepean Highway, Chelsea, 3196, by Friday, 13 May, 2005. Logs may be sent via email to: vk3js@vkham.com

ar

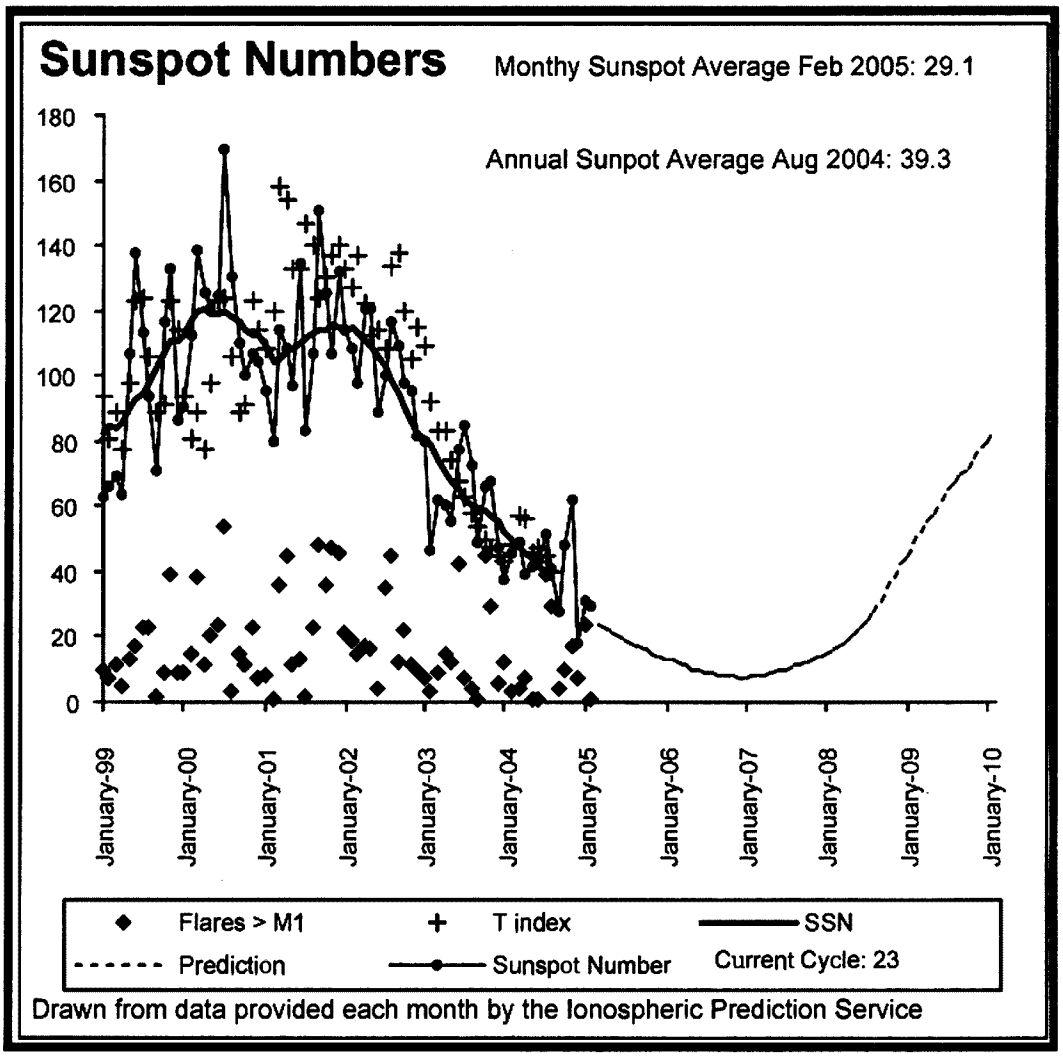
Robin Harwood VK7RH

Ups and downs

The seasonal propagational fluctuations are becoming more apparent with each passing day. I am noticing that the higher frequencies are dropping off as soon as it gets locally dark. Bands above 13 MHz are dead after 0800 although they can unexpectedly remain open until 1200. Winter is rapidly approaching and the shortwave allocations are starting to propagate in the daylight hours. I am increasingly noting that lower powered signals, usually masked by regular international broadcasters, are now being heard. This is due to a dramatic reduction of major broadcasters to Europe and the Americas. Audiences in Africa and Asia still will need shortwave, as there are fewer local placements available for domestic rebroadcasting of international stations.

DRM has been promoted as the saviour of shortwave broadcasting and true, there has been a sizeable increase in stations utilising this mode but there are insufficient numbers of commercially manufactured receivers in the marketplace. They are still expensive in comparison with the standard analogue receivers. Also DRM models have to be marketed differently because there is some confusion with some sets being called digital yet referring to frequency displays without having DRM/DAB capability. Receivers are available with this technology but are costly.

Have you also noticed a dramatic escalation of the so-called Numbers stations? These are clandestine stations exclusively broadcasting strings of four of five figure numbers in a variety of languages These are usually operated by intelligence agencies such as the Israeli Mossad, the CIA, MI6 etc. They have been around since prior to the Second World War and peaked during the so-called Cold War in the 80's. The spoken output is computer generated and almost impossible to crack. The Middle East still remains the major target of these unusual services. Their operational schedule naturally is extremely erratic, although the channels seem to be regular. I suggest you tune down on the lower frequencies because they are rarely above 12 MHz. However a well-known European agency has been operating close to 20 meters for many decades.



I have been experimenting lately with Echolink, which seems to consume less bandwidth compared to various instant messenger platforms. Once I got the firewall configured, I was able to communicate with a few hams yet still a little reticent about using it to operate via a foreign repeater. One does have to be very careful as there are some repeaters on bands not permitted to Australian hams e.g. 220 MHz. I currently reside in a retirement village that does not allow the erection of HF antennas, EL seems to be a temporary way out but does not have the romance of personally operating on HF.

Well that is all for this month. Please email me with your news and views to vk7rh@wia.org.au. 73 de VK7RH

ar

Beyond our shores

David A. Pilley VK2AYD
davpil@midcoast.com.au

South Africa

goes code free

South Africa has gone entry level code-free. This, with an announcement that as of February 4th passing a Morse exam is no longer a requirement for a full Zed-S licence.

According to a press release from the South African Radio League, a technical examination following the South African HARC Syllabus has become the basic requirement for entry to the hobby. Successful candidates are now given a call sign with a Zed-R prefix along with limited High Frequency privileges. Zed-R licence holders have full access to the 160, 80 and 40-metre bands and limited use of frequencies on 20, 15 and 10 metres. Also included is full access to all South African VHF and UHF ham radio spectrum.

To upgrade to a full Zed-S licence, the Zed-R licence holder has to achieve one of a number of electives. These include making at least 100 contacts on the air or by providing proof that he or she has spent at least 50 hours providing communications services for one or more public service events. Passing a Morse test is yet another option to an upgrade but South African radio regulators say that it's no longer mandatory.

The decision to go no code makes South Africa the latest nation to do away with mandatory Morse testing for access to the High Frequency bands. (SARL, ZS6AKV)

(ARNewsline)

Brazil

Radiosports: WRTC 2006

Brazil will be the host nation for the 2006 World Radiosport Team Championship games. Sponsoring groups are the Araucaria DX Group and the Liga de Amadores de Radio Emissão. Your scribe in company with Martin, VK7GN, represented Australia in this event in 1996. If you are interested in representing Australia in this World Olympic event you can obtain more information on-line at www.wrtc2006.com (WRTC). Be assured it is an event that will live in your memory forever and be proud to represent VK.

(WRTC)

60 metres expands world-wide

So far up to nine nations have given their radio amateurs access to the 60 m band, although some are imposing severe limitations on its use. The United Kingdom, Canada, Finland, the United States including its dependencies have opened up 5 MHz channels for use by radio amateurs. The UK and the US allocations include a common frequency of 5403.5 kHz.

The push for the band by the International Amateur Radio Union through its member societies is in recognition that the band fills a propagation gap between the 80m and 40m bands. Germany has permitted an amateur beacon callsign DRA5 to operate on a frequency of 5195 kHz to enable propagation testing using CW and a various digital modes.

In New Zealand the frequency 5680 kHz is available for emergency communications and training by the Amateur Radio Emergency Corps (AREC). Norway has also given access to two channels for internal emergency communications by radio amateurs. There has been a report of amateur stations in Portugal and Russia on 5398.5 kHz but no confirmation is available as to official approval for 60 m band operation in those countries.

(ARNewsline)

Ham honours

VU2RBI named Sandy Lynch Award winner

A ham from India has been named recipient of the 2nd Annual Lynch Memorial Award, given by the Tokyo International Amateur Radio Association. Bharati Prasad VU2RBI, received this honour in recognition of her DXpedition to Andaman Island and for her heroic work in the aftermath of the Indian Ocean tsunami.

VU2RBI has been a ham for more than two decades and is a founding member of the India's National Institute of Amateur Radio. She has provided ham radio communications at many events

Bharati Prasad VU2RBI

including the Asian Games and has helped local administrations with relief work after numerous disasters. She has also been instrumental in promoting several radio clubs across India.

(7J1AIL)

Africa

A job in Africa

The International Red Cross is in need of a communications expert to oversee their radio and computer installations in Africa and on several adjoining islands. A background in ham radio is welcome and could be an ideal opportunity for an adventurous radio amateur to activate some rare locations. For further information contact

ZS6P, whose e-mail address is zs6p@iafrica.com

(SARL)

India

Emergency comms meeting in April

India's National Institute of Amateur Radio is planning to hold an International seminar dealing with the role the hobby plays in Disaster Management and Information Technology. The date is April 18th and coincides with World Amateur Radio Day. One of the main topics to be covered is the lesson learned from the recent Tsunami disaster. More is on-line at www.niar.org

(GB2RS)

ar

VHF/UHF - an expanding world

David Smith VK3HZ - vk3hz@wia.org.au
Leigh Rainbird VK2KRR - vk2krr@telstra.com

Weak signal

David Smith - VK3HZ

This month has seen several periods of enhanced propagation over the southern region of the country. The openings covered a region stretching from Adelaide to East Gippsland and as far north as Canberra. Many contacts were had, and those of note are listed below.

On 16/2, Leigh VK2KRR reported strong signals from Adelaide with several S9+ contacts on 2 m. He also worked Richard VK5USB (S5) on 70 cm. Leigh also picked up traces of the VK6REP Esperance 2 m beacon on Spectran.

From 24/2 to 27/2, a slow moving high-pressure system produced an extended period of good conditions. Roger VK5NY, Brian VK5UBC, John VK5PO, Garry VK5ZK and Phil VK5AKK were busy working many stations from the Adelaide end.

Bill VK6AS has been worked from as far as Mt Gambier and, on several occasions, worked into Adelaide. On the morning 25/2, Leigh VK2KRR was hearing VK6REP at up to S3. Bill then appeared calling CQ on 144.1 MHz and Leigh worked him at S9 level – a distance of 2315 km. Soon afterwards, Ed VK3BG also managed to work Bill.

On the evening of 25/2, conditions were good to the north from southern Victoria. Peter VK3KAI reports working Ed VK3BG on 23 cm at good strength, with some QSB. Ralph VK3WRE and George VK3HV also managed to work Ed. The following night, Dave VH3HZ managed to work Leigh VK2KRR on 23 cm.

On 2/3, Brian VK5UBC, near Adelaide, reports excellent conditions, working, on 2 m, VK3AUU, VK3HZ, VK3II, VK2KRR, VK3RW, VK3ANP, VK3AXH, VK3LY, VK5OM/p and VK1ZQR (945 km). He also worked VK3HZ and VK2KRR on 70 cm.

On the evening of 2/3, Ross VK2DVZ reports working Nick ZL1IU on 2 m. The following morning, he worked Brian ZL1AVZ, also on 2 m.

On 3/3, Chris VK2DO worked VK5UBC, VK5PO, VK5AKK and VK5NY on 2 m. No luck on 70 cm.

Microwave

Colin VK5DK reports that on the morning of 14/3, conditions were very good for microwave operations. The VK3RXX 23 cm beacon in Melbourne was S9 in Mt Gambier. Colin headed off to a local hilltop about 40 km NW of Mt Gambier with equipment for 5, 10 and 24 GHz. At the Melbourne end, Alan VK3XPD went to his local site. Ralph VK3WRE also set up on Mt Tassie, near Traralgon in Gippsland with 5 and 10 GHz gear.

On arrival at Mt Edward, Colin set up on 10 GHz with a CW identifier running. He then received a phone call from Ralph to say that he was copying the signal quite well. Ralph and Colin exchanged 59 reports both ways on 10GHz, and then changed to 5.7GHz and exchanged 59 reports. Unfortunately, the site that Alan had chosen proved not to be good, as he was not able to hear signals on either band.

The distance of the contact is around 525 km, which is about 20 km short of a VK3 record. However, it was the best distance on both bands for Ralph & best on 5.7GHz for Colin.

On 10 GHz, Colin was running 1 watt and 12 watts on 5.7GHz. 600mm dishes are used on both bands. Ralph was running 500mW on 10GHz and 5 watts on 5.7GHz using offset feed dishes with horn feed.

EME

Doug VK3UM has released a new Windows version of his EME Planner and Autotrack, called EME2004. The older DOS-versions of these programs are widely used within the EME community, but are now becoming a little dated.

The new program has most of the features of the old, along with many additional features for Spatial and Real time Noise displays, an extensive database, as well as the prediction planning features. All planet and selected quiet and noise source tracking is provided so if you want to track Mars or Jupiter noise this will do it for you.

The program is available for download from the SM2CEW website at http://web.telia.com/~u92010241/index.html.

Doug also has a handy tip. If you have some unwanted critters gaining entry to your shack (like a 4' tiger snake) he suggests you use steel wool stuffed into the cable ducts (away from any possible moisture). It can be obtained in long rolls and is very easy to install and remove for cable modifications. Mice don't chew it either and hopefully it impedes the passage of long worms? Using the expanding foam stuff works fine but is expensive and you always need to add or remove a cable the day after it sets!

Doug said "I have done that now (to the EME shack) this season after the tangle with the snake. Sure gets the adrenalin going. Fortunately I spotted him as soon as I opened the EME shack door. If I had been sitting there at the time then leaving the shack with headphones on would have been quite a sight ... the mind and heart boggles!" Snakes are a common problem in the bush, and so far it's Douglas 6 ... Snakes 4.

Beacons

Ron VK3AFW reports that the VK3RTG beacon in Melbourne on 144.430 MHz is back on air, in test mode.

The beacon failed a few months ago and, upon further investigation, it was found that the crystal itself had died. Ron decided to do a post-mortem on the crystal and found that the drop of silver-loaded paint that provides the electrical connection with one of the electrodes that sandwich the wafer of crystal was missing, and appeared never to have been applied during manufacture, around 40 years ago. When Ron approached the manufacturer – Hy-Q Crystals – about the problem, they offered to repair it at no cost. How's that for an outstanding warranty!

So now the beacon is on test with occasional shut downs for various adjustments. For the next few weeks it will be radiating into a directional antenna with a NE heading. Ron asks for reports to him by email at vk3afw@optusnet.com.au.

The Dural committee has been busy refurbishing the VK2RSY beacons. The

23 cm beacon on 1296.420 MHz has had the feedline replaced which, by all reports, has greatly increased its level. The 70 cm beacon has also had some work and has been restored to normal level. 2 m is still off air, awaiting a total rebuild.

Rod VK2TWR reports that the VK2RSF beacon at Nimmitabel on 144.414 MHz is undergoing some much-needed refurbishment. It is currently under test from his QTH running 12 W to a pair of "big wheel" antennas and signing VK2TWR. The beacon may not go back to its old site, as there is some doubt about the availability of the site.

Glenn VK2JPR reports that the VK2RMS beacon at Bald Hill on 144.510 MHz is off-air indefinitely as the site has been closed by the National Parks people.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital Modes

Rex Moncur – VK7MO

Joe Taylor K1JT has released a document on the technical aspects of JT65 which can be found at http://pulsar.princeton.edu/~joe/K1JT/JT65.pdf. Major topics include:

- Motivation and Design Philosophy
- Complete Technical Specifications
- Details of Present Implementation in WSJT
- Measured Sensitivity and Error Rate

The document indicates that Joe has found another 0.8 dB in the next version of JT65 (version 4.9.5, just released) that gives 50% correct decodes at -28.8 dB relative to the noise in a 2.5 kHz passband.

Dave VK2AWD reports that WSJT's new 'deep decoder' has made a major difference to the stations he can work via EME. Leigh VK2KRR and Gary VK5ZK have been experimenting with 2 meter JT65 QRP over a 754 km path and are getting copy of special messages down to 2 watts without enhanced conditions. Joe VK7JG, in Launceston, took QRP to the extreme and still received 50% copy from 0.25 milli-watts over the mountains from Rex VK7MO, in Hobart (168 km), without enhanced conditions.

Welcome to Gerry VK2APG who has joined the FSK441 activity sessions and has made his first contacts.

Some news from "Across the Pond". Bob ZL3TY has been fairly active on EME of late, using WSJT JT65b digital mode. His setup consists of a TS790A driving a homebrew 400W linear amplifier to an array of four 12 element K1FO yagis. On 14/12, he worked F6FHP at a (terrestrial) distance of 19,294 km, breaking the current world record by 7 km.

VK0MT Macquarie Island Activity

Dave VK0MT on Macquarie Island has recently become active on 2 m, running 100 watts to a single 10 element yagi. On 16/3, he succeeded in working Rex VK7MO on FSK441A Meteor Scatter. This is the first time that VK0 has been worked from VK7 on 2 m. Not much has yet been heard of Dave from VK3 as the distance (2150 km) is approaching the upper limit for MS.

On 17/3, Dave completed the first EME contacts from VK0, Macquarie Island, on 2 m on JT65 with W5UN and KB8RQ.

Unfortunately, Dave's time at Macquarie Island is coming to an end, as he is due to return to the mainland at the end of March.

Please send any Digital Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

A slow start to February, but it ended up being a cracker in the south of the country after around the 20th of February.

Early on the 1st of Feb, Mike VK4MIK picked up a good path on 70 cm down south from the Atherton Tablelands into the Hodgson Range repeater 438.500. The distance of 639 km was a beauty on 70 cm and is now top spot in the ANVDG VK4 FM repeater records.

The 6th of Feb saw the first good opening in the south of Australia for quite a while. Probably the most interesting occurrence on FM during this opening was at 11.30 am my time. I was talking to John VK5PO on the Barossa Valley 146.825 repeater, we had just finished QSO and all of a sudden Chris VK3VSW calls in from Geelong and then straight after, Dion VK7YBI called in from near Burnie, Tasmania! Only got about one over from Chris before he dropped out as Chris has a big hill in that direction. Dion was OK coming in over 949 km to the repeater! VK5PO could hear Dion direct so they went to 146.550 to try the simplex contact, which I believe they made it through, this is 938 km.

On the evening of Monday the 7th of Feb, some very unusual tropo conditions were noted by some in the SE. A weather front and trough were passing across the SE. The leading edge of the front was around Melbourne and extended back to near Port Augusta. When looking on Internet weather charts, it appeared to be raining under cloud cover over a wide area covering Adelaide to Melbourne and around the coast. I initially dismissed this as being 'rain' and poor conditions.

That was, until VK5UBC and VK5ZLX started reporting some strong conditions on the VK Propagation Logger. Both Brian and Peter reported hearing the Geelong 2 m beacon, then, Brian was able to access the Echuca repeater 146.675. This got my attention and I thought I had better take a closer inspection.

It then appeared there was a strong surface based duct condition, partially before and mainly trailing the weather front. The indicated rainfall on the rain radar was actually radar enhancement caused by the strong conditions. It was very strong and wide spread across the land behind the front. Amazing!

Brian VK5UBC ended up being able to access the Shepparton 146.650 repeater noise free for quite a while. Brian was also able to access Charlton and other VK3 repeaters. At this time Peter VK5ZLX also commented on a second Ch10 TV signal interfering with his local TV reception!

The morning of the 16th Feb saw another good opening in the south. The main Adelaide Hills repeaters were worked here on 2 m but nothing from the 70 cm repeaters. Furthest repeaters

worked here were Port Augusta at 913 km, Port Pirie at 867 km and Central North at 833 km. VK5UBC was worked here on FM simplex and Brian also had a good copy on the Wagga repeater.

Some rare news from the west, courtesy of Phil VK6ADF at Katanning. Phil mentions, "during early February I managed to hear the Mt Barker repeater being used while I was driving around in Katanning. Something that is not a normal occurrence for me, and a contact via the Mt Barker repeater from home that normally I do not trigger." Phil also mentions, Sunday 13th Feb, VK6ET in Geraldton made contact to a Perth repeater for a short period, around 380 km.

The 21st Feb, Charles VK5XCP was aware of the conditions and went portable on a hill at Mt Gambier and worked the 486 km across to the Mt Baw Baw repeater and found George VK3HV, John VK3HJW and Jeff VK3VFL.

From around the 23rd to the 26th of Feb, conditions were absolutely HUGE. Mainly in the southeast, but there were also paths extending into VK6. There was so much going on during these few days that it all blends in and becomes a bit of a blur. This will probably be the strongest opening over the widest area in the SE for the whole year if last year was anything to go by.

I have nothing noted here that was particularly outstanding for FM. I was able to get to the usual repeaters in VK5 and VK3. The 70 cm band was not good to the west during this opening, though it was OK into VK3.

The morning of the 26th saw probably the strongest conditions of the period. Contact to the Mildura repeaters was excellent, full scale on both bands at 466 km. VK3FGN, VK3MTV, VK3NRJ and VK3KYF both at Mildura were worked simplex.

On the evening of the 27th Feb, Charles VK5XCP portable at Mount Gambier worked Dion VK7YBI from Burnie on 146.500 simplex. This was 570 km and Charles' furthest simplex contact. Charles was also going right over Melbourne and working to Yarra Valley and Mount Tassie repeaters.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@bigpond.com.

ar

WIA wecomes new members *continued*

January

Mark Apterman VK3VLY
Geoffrey F Atkinson VK3YFA
David Cooper VK4MIG
Ashley Geelan VK3HAG
Bruce S G Jarrett VK5CMI
Peter B King VK4BPK
Linda Luther VK7QP
Robert Mcdougall VK4CEN
Thomas Sawers VK4AOG
Paul Stevens VK4CPS
Dallas Taylor VK5WA
Pa Van Der Weegen VK2EX

December

James R Anderson VK4AQ
Grahame J Beechey VK2HGA
Brian J Belfrage VK4HBB
Serge Burjak VK4SB
David Byrne VK3DRB
Gordon Clarke VK2ZXD
Graeme A Collins L21222
Rm Dare VK3BRD
Craig Edwards L41086
Julian Grodzicky L10170
Ron Guyon VK2TGH
Gary C Matthews VK4HGM
Eric W Meyer VK4YUZ
Warren Payne VK2UWP
Gerard Rankin VK5ZQV
Kenneth Robertson VK3HKR
Stephen Thompson VK6HST
Charles Vella VK3TCV
Lyle R Whyatt VK5ZNB
Geoff Beadle VK3UDX
Richard Becker L70165
Ronald W Brumley VK4FC
Jacques Brunet VK5ZJB
Lance W Chandler ZL1LWC
Charles G Cottle VK2YA
David Coutts VK2BDA
Sj Daniels VK5HSX
Lee De Vries VK3PK
Shane M Delforce L21221
James Flannery-serle VK3KCU
Vernon French VK7HVF
Warren M Frost VK5HWF
Malcolm J Gardner VK5MJ
Derek K Griffin VK4KKG
Parry Gyngell VK3JPP
Richard Hanna VK2KRH
Paul Harms VK3DCV
Gavin Hart VK2ML
Greg Humphrey L50756
Douglas S Kaye L70164
James Lee VK4AJO
Bruce J Lees VK3FFF
George W Lobb VK2GWL
Warren Mansfield VK3HGU
Douglas Mcdonald VK4KET
Adrian Murace VK6XAM
Kenneth Robinson VK5HAL
George Simmans VK3HGS
Phil Smeaton VK2BAA
Graham C Thomas VK5HGT
Peter Turtiainen VK3TMX
John Watson VK2ZQX
Scott Watson VK4JSR
Stuart Williams VK4KKQ
Lindley J Williams VK7AJ

Pounding Brass in the jungle

Herman Willemsen VK2IXV

Although some types of keys may look the same, they all have their own individual features. However what makes them even more interesting is their history.

The above certainly applies to my newest addition, a Bolivian telegraph key of Siemens & Halske (S&H) design.

In 1847 Prussian Army Officer, Werner von Siemens and German mechanic Johann Georg Halske, founded the company Siemens & Halske.

Initially, S&H was based in Berlin with subsidiaries in Russia and Britain, but over the years the company spread worldwide and changed its name to Siemens.

S&H keys were manufactured between 1871 and 1930.

An unusual feature of S&H keys is their front and back contact arrangements. The lower contacts are actually stiff metal leaf springs or 3 cm long contact feet, which extend to the right and therefore cushion the impact of the top contacts.

The result is a smoother feel, possibly less wear and much softer key clicks, making the key almost soundless. That's why the Germans call this key "Die lautlose taste von S&H" or "the noiseless S&H key".

My Dutch S&H designed key looks neat and proper with lacquered brass, a gutta-percha knob and a varnished hardwood base. It features the lower contact feet and when you use the key, you can hardly hear the key clicks.

When I first saw the Bolivian S&H key it was in a shocking state, but after some careful cleaning, its fittings turned out to be brass, the knob gutta-percha and the rough wooden base showed only faint

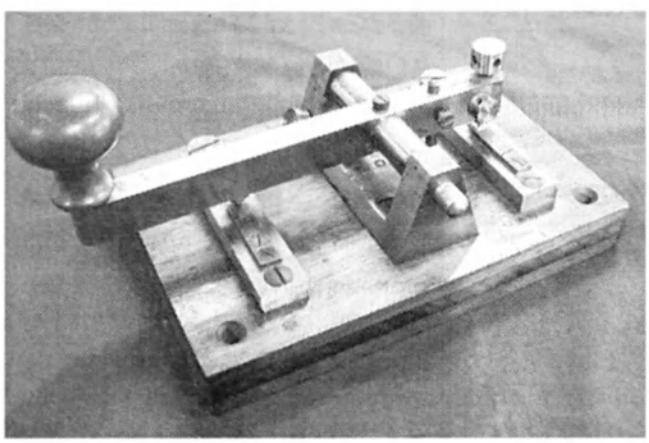


Photo 1 – The Dutch Siemens & Halske key.

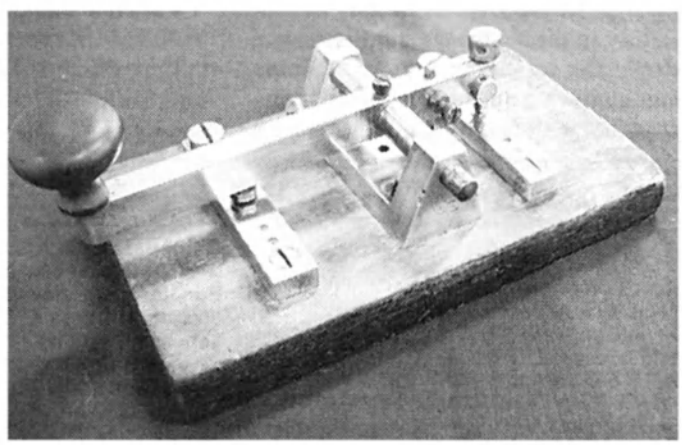


Photo 3 – The Bolivian Siemens & Halske key.

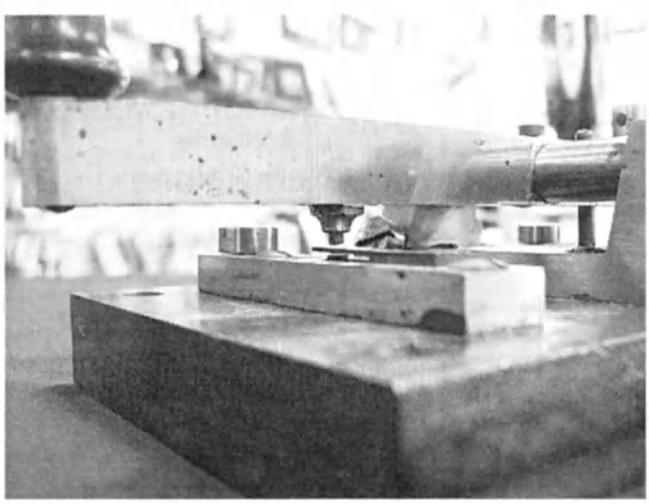


Photo 2 – Another view of the Dutch Siemens & Halske key showing the lower key contact.

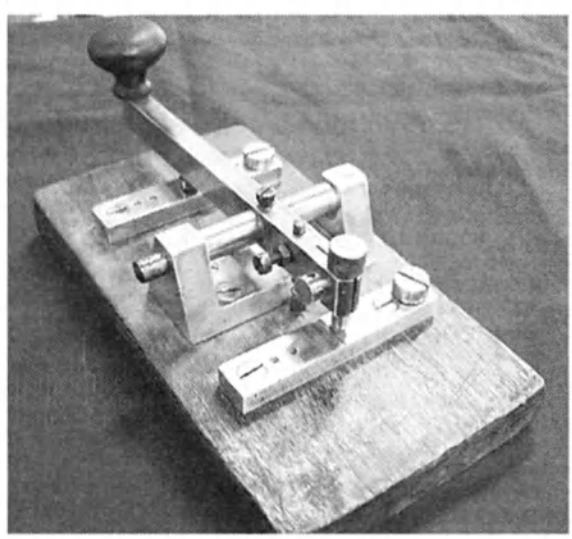


Photo 4 - Another view of the Bolivian Siemens & Halske key where one can see the two holes for the screws which held the 3 cm contact feet.

Over to you

The Institute WW2 Honour Roll is still incomplete

Given there were about 1800 licenced amateurs pre-war, the number of amateurs known to have been lost in action against the enemy is unrealistically low.

I had hoped to interest Veteran Affairs in an exercise which would scan the Wireless World 1938 listing of Australian Amateur radio licensees as a preliminary to a comparison with the National data base of WW2 casualties. Unfortunately the Minister elected not to help.

So by manually analysing documents pertaining to our AIF's involvement in operations against the Japanese in Malaya I have isolated 22 names of army signallers who might also have been radio amateurs. I have checked each of these names against the callsigns listed by the Wireless Weekly, without finding a match.

Signals personnel like Harry Grumber (a Radar officer in Singapore), "Gus" Kappe (Colonel, Div Sigs) and AIF. Signals Lieut. George Gill are highly likely to have had an amateur licence pre war. If any WW2 veteran can help with names of -other Amateurs known to have lost their lives in action against the enemy, I would appreciate a note, with the details, please.

But beware of the situation where a 2/29th- AIF Corporal Signaller named Stephen Brown had 16 amateurs with his surname, but all with different given-names.

By the way, it was Grumber who reported a radar sighting of the first Japanese aircraft on their way south to raid Singapore but was unable to have the air raid alarm sounded because the only officer with a key to the alarm switch was at the pictures.

C.G Harvey VKIAU
Hughes A.C.T

Where do you get it?

As an old timer coming back to some activity and am finding it difficult to locate radio parts both old and new. Mindful that we cannot all get to Wyong when we want to and also that what we are looking for may not be there, I would like to suggest that AR runs an occasional page titled "Where you can get it" or "Who stocks what". This could be put together for each state or major population centres, maybe one of the regular home brewers would volunteer their suppliers list. Regular advertisers in AR could be highlighted.

73 Phil VK2BTT
Lurnea NSW

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

Pounding Brass in the jungle *continued*

traces of paint.

It is obvious that at some stage the 3cm bottom contact feet were removed, as the holes for the screws that held them in place are still clearly visible. So now, when the top contacts meet the lower contacts, the key clicks are loud and clear. Perhaps the key's user preferred it that way.

The antique dealer, who sold the key to me, said that he found the key in 1981 in his hotel in the tiny North Bolivian jungle town of Rurrenabaque (Rurre), on the Beni River, the gateway to the great Amazonian plains.

He told me that conditions there were rather remote and primitive.

You could only fly in or out of Rurre by plane. An ancient generator supplied electricity between 8am and 8pm and dinner consisted of either warm rice with cold eggs or warm eggs with cold rice. Although he can't recall seeing any telephones, locals told him that before their installation, this spark key was used on the telegraph circuit between Rurre and La Paz, providing the only QSO between this remote rainforest settlement and the outside world.

ar

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

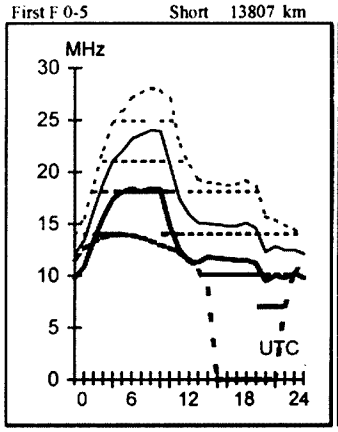
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

April 2005
T index: 29

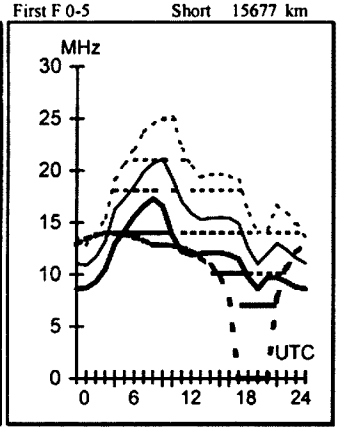
Legend

Frequency scale
UD
E-MUF
QWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

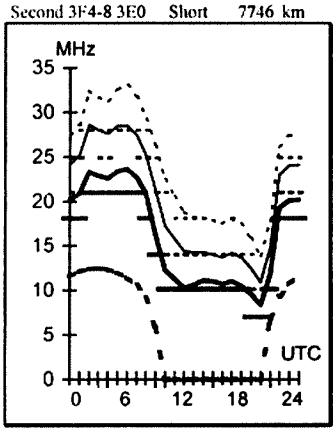
Adelaide-Moscow 318
First F 0-5 Short 13807 km



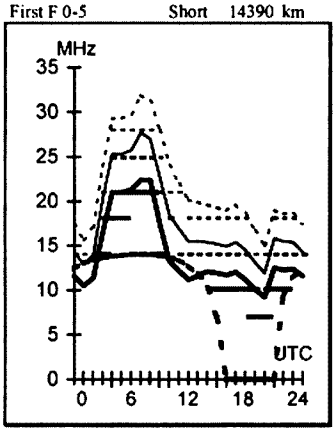
Brisbane-Berlin 321
First F 0-5 Short 15677 km



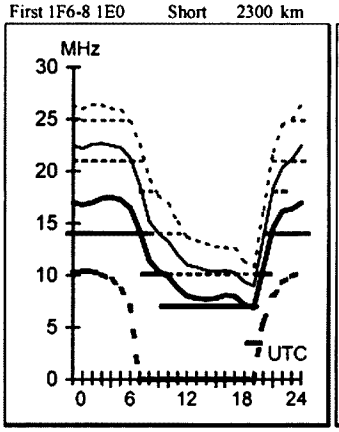
Adelaide-Osaka 357
Second 3F4-8 3E0 Short 7746 km



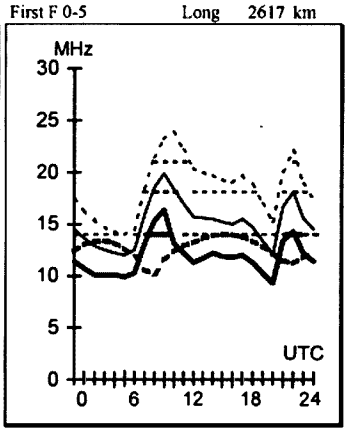
Brisbane-Cairo 288
First F 0-5 Short 14390 km



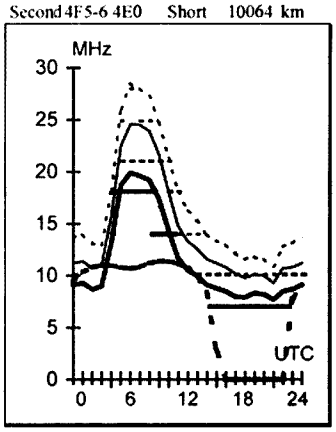
Canberra-Auckland 102
First 1F6-8 1E0 Short 2300 km



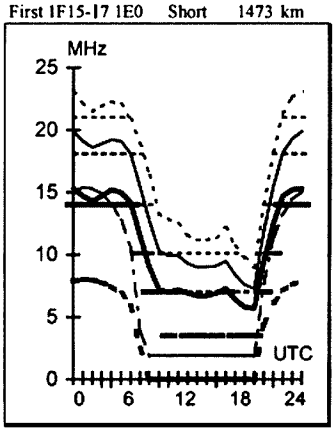
Darwin-London 145
First F 0-5 Long 2617 km



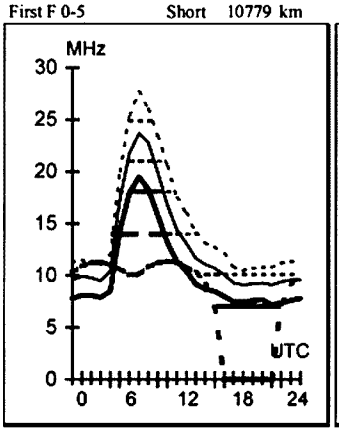
Adelaide-Pretoria 238
Second 4F5-6 4E0 Short 10064 km



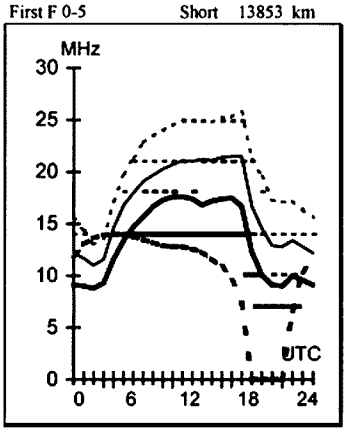
Brisbane-Noumea 70
First 1F15-17 1E0 Short 1473 km



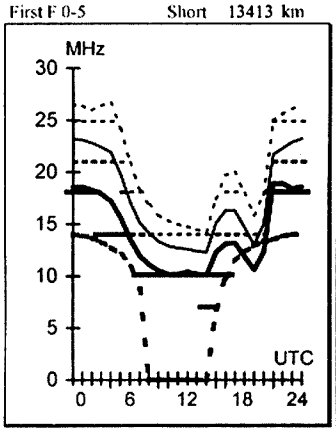
Canberra-Capetown 219
First F 0-5 Short 10779 km



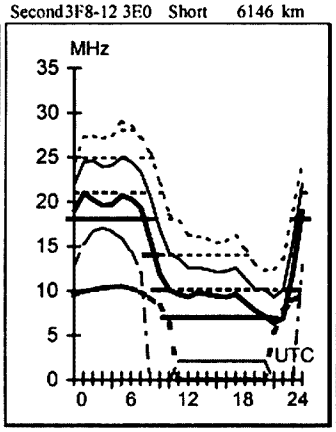
Darwin-London 325
First F 0-5 Short 13853 km



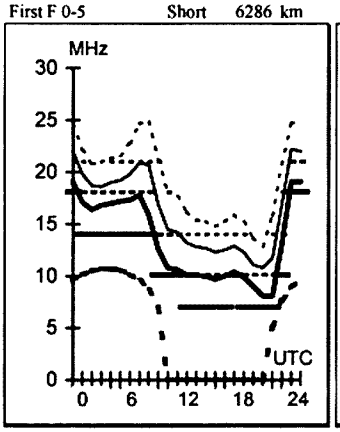
Adelaide-Seattle 51
First F 0-5 Short 13413 km



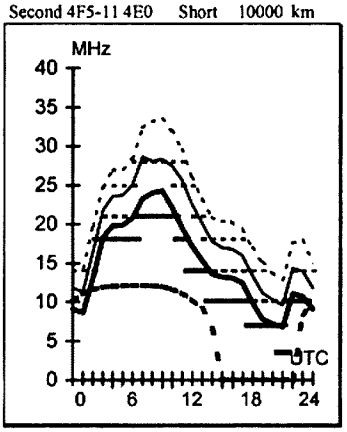
Brisbane-Singapore 295
Second 3F8-12 3E0 Short 6146 km



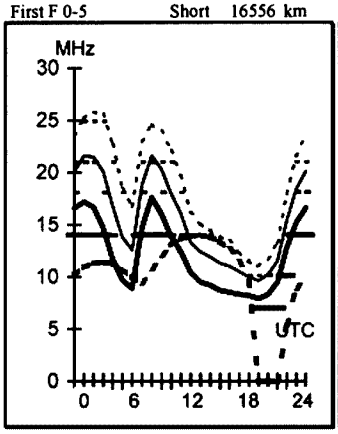
Canberra-Manila 327
First F 0-5 Short 6286 km



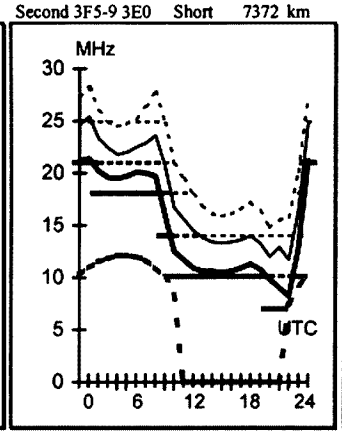
Darwin-Riyadh 295
Second 4F5-11 4E0 Short 10000 km



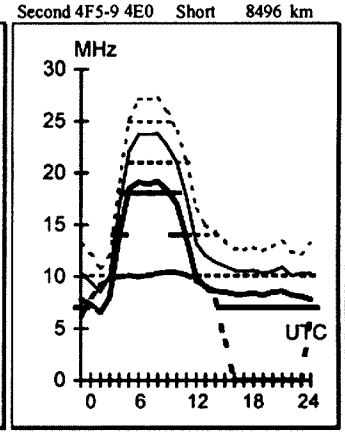
Hobart-Dakar 209
First F 0-5 Short 16556 km



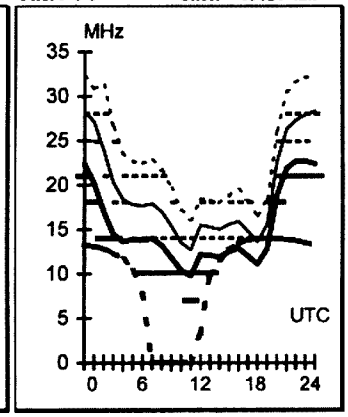
Melbourne-Bangkok 312
Second 3F5-9 3E0 Short 7372 km



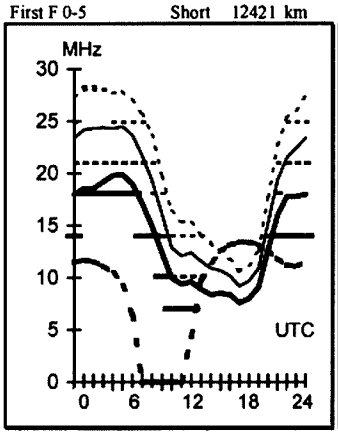
Perth-Harare 267
Second 4F5-9 4E0 Short 8496 km



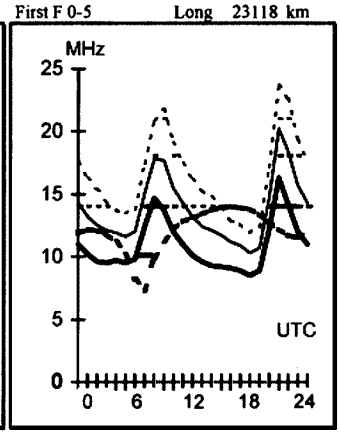
Sydney-Miami 86
First F 0-5 Short 15026 km



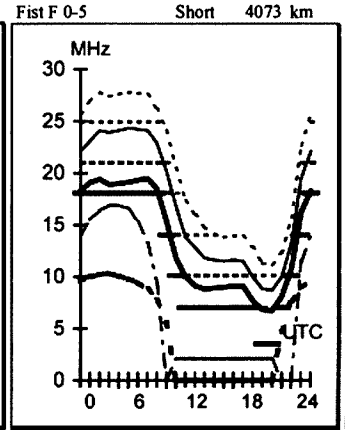
Hobart-Lima 72
First F 0-5 Short 12421 km



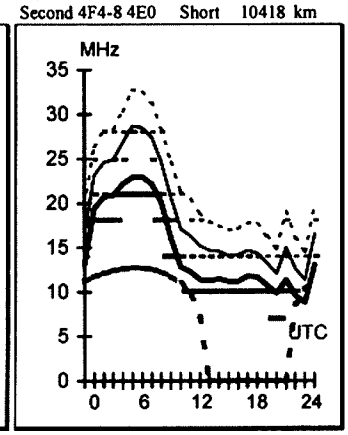
Melbourne-London 131
First F 0-5 Long 23118 km



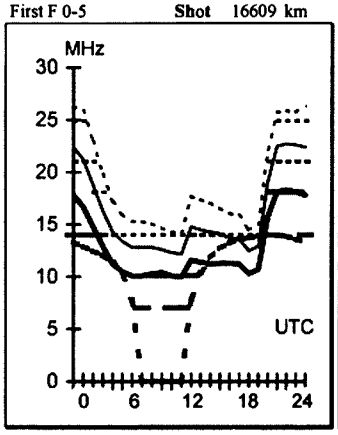
Perth-Port Moresby 69
Fist F 0-5 Short 4073 km



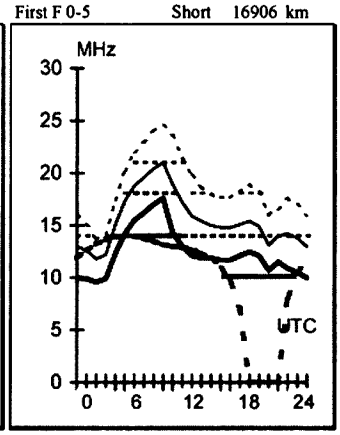
Sydney-New Delhi 302
Second 4F4-8 4E0 Short 10418 km



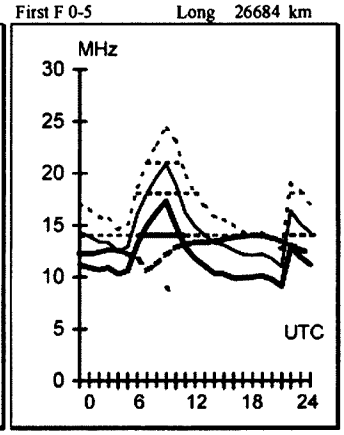
Hobart-New York 80
First F 0-5 Shot 16609 km



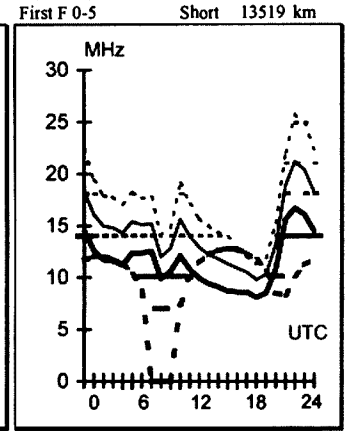
Melbourne-London 311
First F 0-5 Short 16906 km



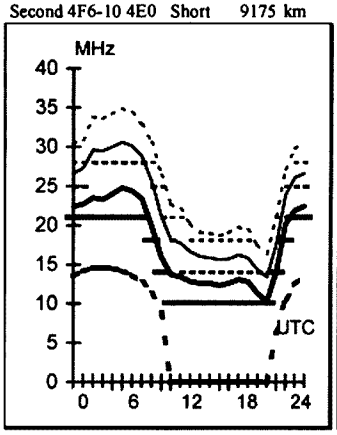
Perth-Rome 123
First F 0-5 Long 26684 km



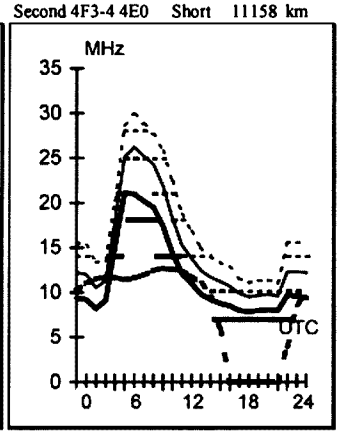
Sydney-Rio de Janeiro 164
First F 0-5 Short 13519 km



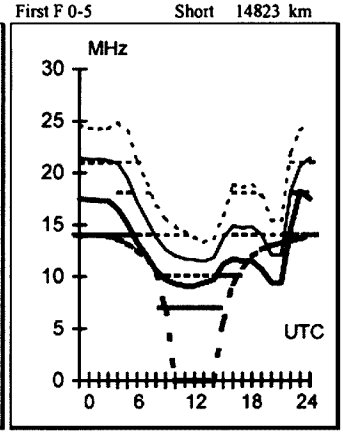
Hobart-Seoul 344
Second 4F6-10 4E0 Short 9175 km



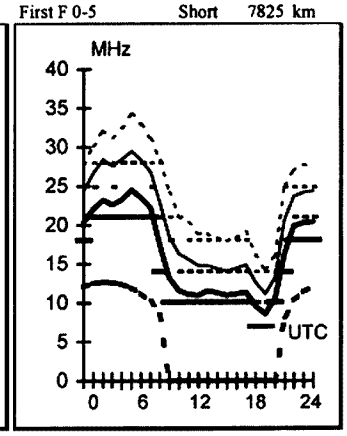
Melbourne-Lusaka 241
Second 4F3-4 4E0 Short 11158 km



Perth-Vancouver 60
First F 0-5 Short 14823 km



Sydney-Tokyo 350
First F 0-5 Short 7825 km



Hamads *classifieds* FREE

FOR SALE NSW

Kenwood TS-50S s/no 41122062, VGC with instruction manual plus full ($54) service manual $800. Tx valves 3E29/829B with ceramic sockets (6) $25 each. Keith VK2AXN QTHR Phone 02 9489 0304 kandpa@bigpond.com.

Tower, crank up to 17m, rotator and controller 115V or 26V and HyGain TH-3JR JR Beam $500 the lot. Aub Topp VK2AXT QTHR. Phone 02 9635 4384 any evening.

DX location - Ulladulla NSW, with quality large 3BR two-storey home attached, separate 2BR guest accommodation. Headland location with ocean, coastal and mountain views. Walking distance to CBD and beach. Proven HF DX location, solid VHF and UHF paths Bega to Wollongong. Existing antennas, active local radio club. $615k, offers considered. VK2EL, Phone 02 4455 5825, sbourke@shoal.net.au.

CRO dual 35 MHz $250, *Audio osc* sin/sq 0D100 kHz metered +6/-100 300/300 $75, *Yaesu ADMS-1E* HHs $40, *Ant TE33 KR-400* rotator 8m pole 9m FS tower $400, TNC MFJ1270 + disc $30, voltage/time/temp car unit $15, data switch boxes (3) inc 5 leads $10, *Hills TV converter* UHF/VHF $10 *Zephyr 2IE-2k* mic new in box $5, TWT housing $FREE, collect beam, all + postage. Geoff VK2BGP QTHR Phone 02 4982 9748.

4-125A with socket and *QQV06-40A* with 3 sockets. Good condition. Ron VK2WB QTHR, Phone 02 4232 1794.

Kachina 505 DSP HF transceiver with software, manual and mike, price $1500. *Wilson System SY-1* widely spaced 4 element three band 2kW beam, price $350. *Dentron 2KW* antenna turner price $350. Tom, VK2OE@arrl.net, Phone 0413 796 851, 8-9 PM.

WANTED NSW

Circuit diagram or hand book for *AWA 215 VHF transceiver.* A good photocopy will do. I am happy to pay copying expenses, or cost of a manual. John VK2DVW QTHR vk2dvw@hotmail.com or Phone 0409 821 357.

FOR SALE VIC

IC-728 s/n 02346, *AT-160, PS-55* (20 amps). All matching Icom with manuals and original packing. The lot $800. *Tower 38 feet,* one piece triangle, tube construction. Buyer to remove, easy to lower and handle $200. John VK3HCT QTHR Phone 03 9580 8369.

Amateur Radio magazine 1980 to 1990 plus some extra overseas magazines. $20. VK3YRP Phone 03 9888 1201.

Military Receiver R-390A made by Motorola S/N 1937. Clean, inside and out with refinished front panel and knobs. supplied with top and bottom covers. Fully operational and aligned. Has Collins PTO. Price $790. *Collins R105 A /ARR-15* receiver- (replaced the BC -348)- complete - no mods and comes with MT-461 mount and plug. EC condx.. S/N 398 O. Price $360. *BC-348Q* receiver with original dyno and shock mount FT-154. Mount has the ORIGINAL PL-P103 plug assembly. Shock mount is fairly rare, plug is even rarer. Radio no holes, no mods and panel /knobs been refinished in wrinkle per original. Price $650. Pete VK3IZ QTHR email: jupete@bigpond.net.au Email contact preferred during April absence o'seas until May 1. Freight/Packing extra. Photos on request.

WANTED VIC

Pole and first hinged stage of Nally Tower. Ken Morgan VK3CEK Phone 03 9592 9957.

Tamaya Digital Navigation Computer. Some time ago, I sent this computer to an amateur in Melbourne. I have now found the Instruction manual for it, but I have lost your address and name. If you would please contact me at vk3dbb@bigpond.com or QTHR, I will send it on ASAP. Don VK3DBB.

Good copy of Drew Diamond's *Radio Projects for the Amateur,* Volume 1, to complete my set. Call Don VK3DBB on 03 5941 1351 AH, or QTHR, or at vk3dbb@bigpond.com.

FOR SALE QLD

Yaesu FT- 1000 with BPF-1 filter module,MD-1 desk mike,SP-5 speaker,OP manual. Ex cond. Any reasonable offer, VK4WD-SK.Contact Colin VK4ACH- Phone 07 3356 9816 or Email tarah@powerup.com.au.

WANTED SA

1296 transceiver, Yaesu, Kenwood or other make(s) with 10 watt output, mobile. Being used for club project. Merv Phone 08 8346 7042 VK5MX QTHR.

MISCELLANEOUS

We want to hear from all who knew the 277 Radar. This type of radar was used in many services in WWII. We are establishing a historical display of one as part of the Bureau of Meteorology in Melbourne. Harvey Edwards VK3XKI, h.edwards@bom.gov.au, Phone 03 9890 8006.

• **The WIA QSL Collection requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

TRADE ADS

PSK-31, SSTV, RTTY SOUNDBOARD Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

RADIO SPECIALISTS sales and servicing. Buying radios. Shop: 243 Seacombe Road, South Brighton (Adelaide) 08 8298 3906

email:rfwizard@optusnet.com.au for prices.

NOTE:I do NOT import radios *from the* USA. Can you afford to write a radio off? VK5VK

About hamads....

- Hamads may be submitted by email or on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newunltd@bigpond.net.au* **Fax:** *03 9756 7031*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

ADVERTISERS INDEX

AEI	25	Icom	16, OBC
Andrews	17	Ozgear	23
Benelec	IFC	TTS	27
Bushcomm	8	54s	55
Com-an-tena	23	VK Discounts	55
TET-Emtron	16	Winlink	17
G & C	9	www.vk3ajj.com	55

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: ★ **$ 75 for full members (F grade),** ★ **$ 70 for pensioners and students (G and S grade), and** ★ **$ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HP and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt VK4KF Ken Fuller	Phone 07 3221 9377 qac@wia.org.au ewan.mclsod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK6 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 679.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3586kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK8 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk8.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK1WIA Sunday 9.0am via WIA network
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

sseti EXPRESS

Graham Shirville G3VZV

SSETI Express is the first of a series of satellites being developed by the Education Office of ESA – The European Space Agency as part of the "Student Space Exploration & Technology Initiative"

It is being built by university students from a number of teams from all across Europe and being assembled at the ESA ESTEC facility in the Netherlands.

The satellite is set for launch on a Cosmos rocket later this year with a number of other satellites into a sun synchronous 98° 680km orbit from Plesetsk in Russia.

Neil Melville - SSETI Express Project Manager captured on the Webcam on 8th March 2005 - admiring the satellite under construction in the clean room at ESTEC!

see article on page 39

Sam Jewell G4DDK captured on the webcam "resting" in the clean room on 3rd March 2005

The Ground Station

The S band unit in its enclosure

The joy of a successful baud rate change

ICOM'S GREAT CHAMPIONS

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706.

Now includes 70cm @ 20W and 50W on 2m Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch Detachable Front Panel (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied:HM133.

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495 KHz - 1 GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

ICOM

AIRBAND AMATEUR LAND MOBILE MARINE RECEIVER UHF CB

find your nearest ICOM dealer at

www.icom.net.au or (03) 9387 0666

PH416_AM02

Volume 73 No 5
May 2005

Amateur Radio

$6.50
incl GST

The magazine for AUSTRALIAN radio amateurs

Pt 2

Brian Clarke VK2GCE ~

Unravelling the mysteries of connecting radios to antennas

plus

Round cable suppression cores
Ron Sanders VK2WB

"Paddyboard" circuit construction ~ revised
Drew Diamond VK3XU

VK7 promotes a hobby for all ages

9 770002 685055 05

BENELEC

YAESU

Conquer the Elements!

Ideal for the most demanding field use, the exciting new YAESU VX-6R features wide receiver frequency coverage, JIS7 submersibility weatherproofing, the Emergency Automatic Identification (EAI) system for rescue operations, and ultra-simple keypad access to the features you need now!

NEW

- Compact size, utilizing a rugged case with weatherproofing O-rings, rated to JIS7 submersion specifications (immersion to 3 feet for up to 30 minutes).
- High-capacity (1400 mAh) FNB-80LI Lithium-Ion Battery Pack provides a typical 5-Watt operating time of 7 hours.*
  *(144 MHz. duty cycle of 6 minutes TX, 6 minutes RX, 48 minutes standby)
- One-touch Direct Memory Recall (DMR) access to most important memory channels (similar to channel access on a car stereo)
- Large concentric control knobs for easy adjustments while wearing gloves.
- Wide frequency coverage: 504 kHz – 998.99 MHz (cellular blocked and non-restorable).
- 900 Memory Channels with alpha-numeric labels assignable into 24 Memory Banks.
- Internal temperature sensor built in, with barometric pressure display via optional SU-1 module.
- External DC operation capability while charging battery pack.*
  * Transmission not possible when just using charger connections.

144/430 MHz* Dual-Band Submersible FM Transceiver

VX-6R

*222 MHz band @ 1.5 W included

Submersible and Rugged

Magnesium rugged, feature packed top of the line

VX-7R/RB

Field-ready, compact, and easy to use

VX-6R

Ultra-Rugged

Rugged Dual-Band HT with EAI

FT-60R

Ultra Compact

Tiny yet tough, and feature-packed

VX-2R

Benelec Approved Amateur Transceiver Dealers

NSW

Andrews Communications Systems
Tel: 02 9636 9060
lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899
sales@newcastleprosound.com.au

Action Communications
Tel: 02 4732 2788
action@pnc.com.au

VIC

Strictly Ham P/L
Tel: 03 9729 7656
sales@strictlyham.com.au

G & C Communications
Tel. 03 5996 3298
gccomm@bigpond.net.au

Qld

Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

Ozhelp Services
Tel: 07 3273 7263
sales@ozgear.com.au

SA/NT

POSNAV Systems P/L
Tel: 08 8342 4700
brenton@posnav.com.au

Radio Specialist
Tel: 08 8298 3906
rfwizard@optusnet.com.au

WA

Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 5
May 2005

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Amateur Radio Magazine Awards 2004 13

ARISS: A way to get the next generation interested in amateur radio 26
J.A.(Tony) Hutchison VK5ZAI

Space station talks to St Martin's in Mt Gambier 27
Tony Hutchison VK5ZAI

TECHNICAL

An experimental HF aerial analyser 5
Jim Tregellas VK5JST

Aerial Analyser kits 13

Unravelling the mysteries of connecting radios to antennas. Part 2 14
Brian Clarke, VK2GCE

Round cable suppression cores 21
Ron Sanders VK2WB

"Paddyboard" circuit construction ~ revised 23
Drew Diamond VK3XU

Modifications to the KR400 rotator 50
Barry White VK2AAB

COLUMNS

ALARA 38
AMSAT 45
Beyond our shores 40
Contests 41
Directory 56
Editorial comment 2
Gridsquare Standings 44
Hamads 54
HF predictions 52
Silent key 25, 39, 48, 51
Spotlight on SWLing 46

News from...
VK2 30
VK3 33
VK4 33
VK5 34
VK6 35
VK7 36
VHF/UHF – an expanding world 47
WIA comment 3
WIA news 4

Our Cover this month

"Over the weekend of 2 and 3 April, 2005 REAST (Radio and Electronics Association of Southern Tasmania) displayed and promoted amateur radio and electronics to thousands of people at the biennial Model Makers and Collectors exhibition at the Derwent Entertainment Centre."

Read the whole story in "News from..." VK7 on page 36 and 37

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

June Fox	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
Education	Ron Smith	VK4AGS
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	t.b.a.	
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glen Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

Activity month

I have been busy making things (including the usual range of mistakes) in April.

I built the Aerial Analyser described by Jim Tregellas VK5JST on page 5 of this issue. Mine works exactly as described and I am very pleased with it. However as with all kits you need to take care at every step to have the correct components and make sure the solder joints are well made and that you have not bridged tracks, if you use a printed circuit board.

Another project I have had sitting around for nearly a year is the power meter described in QST June 2001 on page 38 using an Analog Devices AD8307 with a logarithmic output. It can measure nanowatts to 100 watts. This has not been plain sailing due to my lack of attention. How did I have a 6.8 kΩ resistor instead of a 6.8 Ω? Why did I try to connect to a pin 1 on an IC when it should have been a pin 8? Bother, I will just have to accept that I am not perfect!

I had a great time in the bush with John Moyle Field Day. Four of us from the Elizabeth ARC went out on the field day each with a complete station and operated as we felt fit between two sites north east of Adelaide. My "Beetle with antennae" is shown on the inside back cover. I am still sorting out how to sleep comfortably in it. First you do have to remove the backs from the passenger and back seats and then pad up the passenger side of the car. With the correct matressing it is great. We cooked with gas where we were allowed and power came from car batteries and GMC 750/850 watt, 2 stroke generators.

The WIA National first AGM will be about to be held or has just been held when you read this. The organisation is settling down. The flow of information through the WIA website confirms that the board is kept very busy. I have great admiration for Michael Owen, who is apparently everywhere in Australia on amateur radio business and is still able to make a living at his "real job". The amount of work done by volunteers to keep amateur radio afloat is enormous. There are only two paid staff in the Melbourne National office, every thing else in done in donated time. As it said in a Summerland ARC newsletter, "JOIN THE WIA. Be a MEMBER and NOT a MOANER."

The flow of material to be published in AR is slowing so please use the winter months to sit down and share what you get up to in amateur radio. I am usually short of front cover material. I need a good balanced contrast picture and a story to go with it. June AR will be the annual "Women in radio" issue. I have a picture and a story to go with it for July but after that?

In closing, the Harry Angel Sprint was held on a very noisy 80 m band but in the true amateur spirit we all soldiered on and I heard scores near 40 early on. I got 11 contacts. So please get your log in if you participated.

Good DX and local chats,
73 Colwyn VK5UE

NOTICE is hereby given that the ANNUAL GENERAL MEETING of
The Wireless Institute of Australia
to be held at 2.00 p.m. on Saturday 7 May 2005 will now be held at:
the Italo Australian Club 78 Franklin St Forrest ACT,
and not as previouslyadvised.

We do hope that this unavoidable change of venue will not cause any inconvenience, but the new venue for the Meeting is at the Italo Australian Club where the Annual Dinner will be held at 7 p.m. We do hope to see as many members and their partners as possible at the Dinner as well as at the Annual General Meeting and the Open Forum. his venue also gives us the opportunity to speak with fellow members in a friendly environment before the dinner, and ***don't forget to book for dinner.***

Michael Owen VK3KI

"The WIA has never done anything for me!"

We have all heard that said.

I have been involved in the IARU and IARU Region 3, the ITU and the WIA, both in the past and now more recently. For many years until about a year ago, I really had looked at the WIA with the eyes of an outsider, and now for 11 months or so as the WIA national (not as I once was, Federal) President.

So, partly with the eyes of an outsider, how do I react to that assertion?

One problem in responding to a statement like that is that amateur radio is just such a mix of intense interests that the WIA finds it hard to meet all of those needs.

The WIA provides a QSL service for all members at no cost to the members. Great, if you are keen on QSLs, but what if you are not interested?

The WIA VK1WIA broadcasts once a week provide, I think, brilliant information and comment, covering the whole country. Great, if you want to and are able to listen to the broadcasts, but what if you really cannot get to hear them, or you just don't want to?

The WIA provides members with what is today the only amateur radio magazine in Australia, with worthwhile technical articles and information as well as information about state and regional activities. Great, but what if you really don't think out of date print media fits within the modern world, and anyway the photographs are too often not really good enough?

The WIA provides continuing and up dated information about what it is doing and what others are doing affecting amateur radio through its website. Great, but what if you are one of the 25% (I am told) of members who do not have access to the Internet?

The WIA sponsors various awards and contests. But what if you couldn't care less about awards or contests?

The WIA provides, through the clubs, (at least at present) an examination system that enables most people to qualify as an amateur almost anywhere in the Commonwealth. Great, but what if you already have an unrestricted licence and don't have to qualify, and you did so all by yourself, and you didn't need any help from anything the WIA did, and anyway more amateurs just means more interference?

I believe that the WIA must provide services for its members, and while I accept that, because of that very diversity of interests, most things that we do provide will be of interest to only some of our members.

But, that is only part of what the WIA does.

The core responsibility of the WIA, its primary object, is to "to promote, advance and represent in any way it thinks fit Amateur Radio and the interests of Radio Amateurs", which if the WIA is effective, must be for the benefit of all radio amateurs, whether or not they are members.

But why do we need a WIA to do that?

The regulation of the spectrum nationally and internationally is complex.

In Australia, the role of the ACA is to develop a national position on the allocation of the spectrum, and it does so by involving various interests. It deals with one defence department, two telcos, one Television Australia, one aviation department, and so on. It cannot and will not deal with 14,000 individual amateur licensees. It deals with one body, and that body is the WIA.

Internationally, there can only be one national radio society from each country that is a member of the IARU, the International Amateur Radio Union, the surprisingly influential representative of the world's amateurs to the International Telecommunications Union, the ITU. The Australian national radio society is the WIA.

The WIA is also a member of the IARU Region 3 organisation. Part of every WIA member's subscription goes to IARU Region 3, and a small part of that goes on to the IARU.

Please don't underestimate the importance to the amateurs of Australia of having a strong and effective representative body.

Part of the story of the 40 metre band at the last ITU World Radiocommunications Conference in 2003, the WRC03, when against all odds, the band 7.1 to 7.2 MHz was allocated to the amateur service in Regions 1 and 3, is that that only happened after Australia changed its position in the dying hours of the 4 week treaty conference.

There were two members of the Australian delegation who were there representing the amateur service.

We had two amateur delegates because the WIA is recognised by the ACA as the body representing amateurs and so was able to nominate 2 members of the delegation to the ACA.

One was funded completely by the WIA.

And preparation for the next WRC, WRC 07, is already well under way and the WIA is fully involved.

That is why I believe that a single strong WIA is essential to our survival.

That is why I believe that over the years the WIA has done much for every Australian radio amateur, and the assertion that "the WIA has never done anything for me" is just not right.

Let me be very clear about this: I know and accept that the WIA just cannot reflect the view of every amateur on every issue.

But it is no answer to say I won't be a member because I didn't agree with the WIA policy in relation to a particular matter. We do all agree on certain fundamental matters, such as the allocation of our bands, and the retention of our basic privileges, the threat of BPL and the like.

That is why I can ask every amateur to be a member of the WIA.

The other answer, the WIA will do it anyway, whether or not I am a member is also no answer. The more amateurs who are members of the WIA the more the WIA has credibility as representing Australian radio amateurs. And, without members the WIA will not have the funds to do what it should do.

That is why I should ask every amateur to be a member of the WIA.

ar

WIA news

WIA Board meets

The WIA Board met in Sydney on Friday 8 and Saturday 9 April 2005.

The Board conducts its day-to-day business by phone and email and written resolutions, and so this was its first formal face-to-face meeting this year.

Considerable time over the two days was devoted to reviewing the office, and it was decided that it was essential to allocate a part of this year's budget to new equipment, furniture, software and hardware.

QSL operations

The WIA Board decided to maintain existing structures and operations to meet its promise to provide WIA Members with a no cost QSL service.

Inwards QSL will continue to be directed to the internationally advertised PO Box or other address. The Westlakes Amateur Radio Club will be the focal point for Outwards QSL operations.

QSL Bureaus will operate on a reimbursement basis. General instructions and the Expense Claim form are available on the WIA website.

Advisory Committees

The Board reviewed the present WIA structure, and decided to create a new Advisory Committee for the Northern Territory, as recommended by WIA President, Michael Owen, VK3KI, following his recent visit, and to use that as a model for the rules for other Advisory Committees when elections become due.

The Board also decided to seek to enhance its lines of communications with all Advisory Committees.

Budget for 2005 year

The WIA Board has agreed on a budget for the current WIA financial year, including allowances for monitoring the BPL trials, developing and printing a Foundation Licence Manual, training assessors for the Foundation Licence and for meeting the WIA's obligations under the various Implementation Agreements.

WIA Board Reviews Membership Fees and Categories

The WIA Board has reviewed current membership categories and subscriptions and decided to create a new membership category, which will be called a "Family Membership".

The Board also decided to offer a 5-year subscription for all categories of membership, but not to change any existing subscription rates.

Details will be included with next billing cycles renewal notices and on the WIA website.

WIA to establish a Club Grants Scheme

WIA Board has decided to establish a Club Grant Scheme, whereby Affiliated Clubs with at least 50% WIA membership would be able to lodge submissions seeking a grant in the 2006 calendar year for a particular purpose.

Subject only to unforseen budget constraints, at least $1,500 would allocated for this purpose in the 2006 financial year.

The WIA will announce further details once they are finalised

WIA Board reviews and adopts Merit Award Rules

The WIA Board has slightly modified the rules for the WIA Merit Awards.

These awards are Honorary Life Membership, the G A Taylor Medallion award, the Ron Wilkinson Achievement Award made possible through the generosity of Mrs Mary Wilkinson, widow of the late Ron Wilkinson VK3AKC and the President's Commendation.

Details of the awards and the rules will be published on the WIA website.

The Board is making two awards this year and they will be announced at the Annual General Meeting and Annual Dinner in Canberra on 7 May 2005.

New ITU Block for the Cook Islands

The ARRL reports that New Zealand has received a callsign prefix block, E5A - E5Z, from the ITU for the exclusive use of the Cook Islands. This makes the Cook Islands a "political entity" for DXCC purposes.

St Martin's Lutheran College, Mt Gambier, talks to the ISS

The Amateur Radio International Space Station contact between the international space station and St Martins Lutheran College in Mt Gambier, South Australia on Thursday March 17th 2005 was a great success. Ten students ranging from reception to year nine asked Astronaut Leroy Chiao all the twenty questions scheduled with around twenty seconds to spare before the ISS slipped below the horizon.

The telebridge link was handled by Nancy, WH6PN in Hawaii, and after the ISS had passed Tony, VK5ZAI answered questions from parents and guests.

The evening was covered by TV, radio and local press.

This was the seventh Australian school to have taken part in the ARISS.

The Oxley Region 30th Annual Field Day Port Macquarie 11 and 12 June 11

This year the very popular New South Wales mid coast field day will be held over the weekend of June 11 and 12 at the picturesque coastal resort of Port Macquarie. The organisers say that this year's field day will be the biggest and best, featuring several events with a total prize value of over $5,000.00. WIA President, Michael Owen, VK3KI, will be the guest speaker at the dinner on Saturday night.

ACA identify high levels of interference in Moruya NSW BPL Trial

The Australian Communications Authority (ACA) have published a report on the Wommera Consortium BPL field trial in Moruya NSW.

Following the ACA report, Owen Duffy, VK1OD, has presented an analysis of the observed electromagnetic radiation from the trial, with reference to interference to amateur radio operation.

He concludes that "An amateur radio station located in a residential environment where a similar BPL system was deployed would not be safely able to transmit at all on 3.6 MHz and 21 MHz bands because of the high risk of interference to possibly active stations that would not be heard through the BPL interference, effectively curtailing all activity on the band by such a station".

The report also concludes that frequency "notching" as demonstrated in the Moruya trial is not an effective measure against the substantial interference observed from BPL trials thus far.

continued on page 29

An experimental HF aerial analyser

Jim Tregellas VK5JST

Ever wondered about that SWR meter and whether it is really telling the truth? Like to develop whips and dipoles? Well, me too. But to make measurements like these, one needs an aerial analyser to measure impedance and frequency. Because I like fooling around with electronics, out of sheer bloody mindedness I decided to roll my own. Here is the result - and may the force be with you.

The theory

I did a lot of scratching around to find a test circuit which would allow the simple measurement of impedance at different frequencies. For a start, I looked at things like bridges and network analysers. Network analysers typically use 6 port circulators to measure impedance (arghh!) and bridges usually require the simultaneous optimization of two variables to get a result, together with lots of tweaks and fiddles to get them to work properly over a wide frequency range (arghhh again!). So what to use? It was pretty obvious that whatever I did, a microprocessor was going to be involved to do frequency counting and cope with the calculations.

What eventually evolved was a simple circuit in which a resistor was placed in series between the frequency generator and the load. The generator output voltage is measured, as is the voltage across the series resistor (the current) and the voltage across the load. This data is sufficient to allow calculation of the load resistance and the MAGNITUDE (but not sign) of the series load reactance. It leaves the question as to how to determine whether the series load reactance is capacitive or inductive. To answer that, the user simply changes the frequency slightly. If the magnitude of the series reactance increases as the frequency is moved upwards, then the series reactance is an inductor. And vice versa for a capacitor. So there was the basic operating principle, and figure 1 shows the mathematics the microprocessor must use to calculate load resistance, load reactance and SWR. Of course, as in all things technical, it is never quite that simple and it is here that the plot gets bloody.

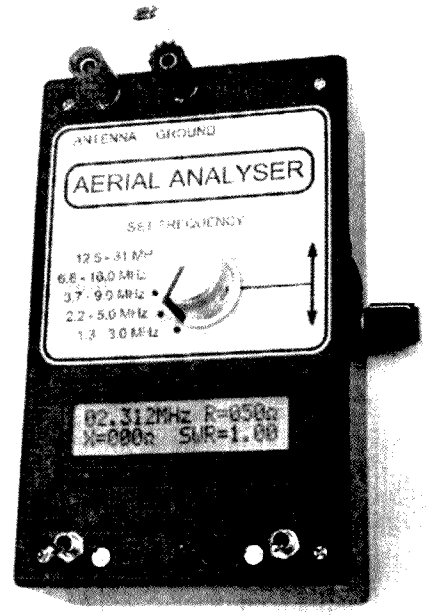


Photo 1. The Aerial Analyser in action.

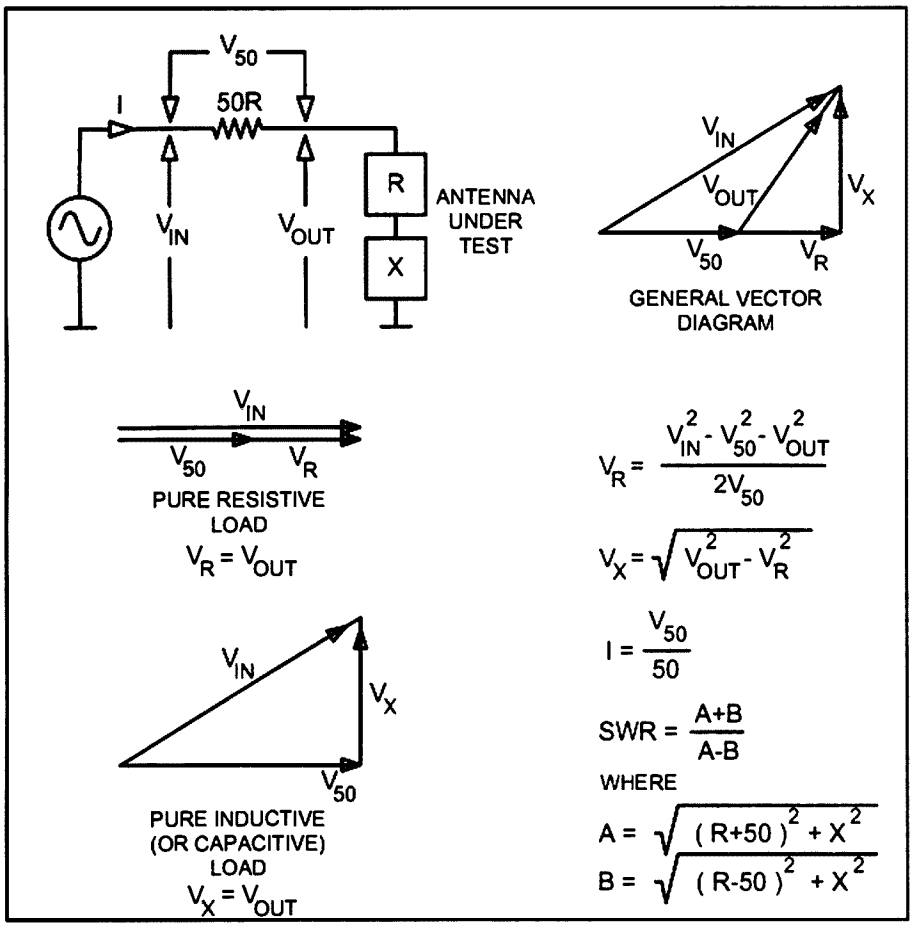


Fig 1. Mathematics used to calculate load resistance.

How it works:

The process starts with an RF signal generator. This must provide a stable, flat, high level sinusoidal output into the test circuit, combined with a low output impedance. The need for frequency stability is obvious, while the low output impedance and flat output characteristic guarantee that the largest possible signal will be injected into the microprocessor analogue to digital converter inputs.

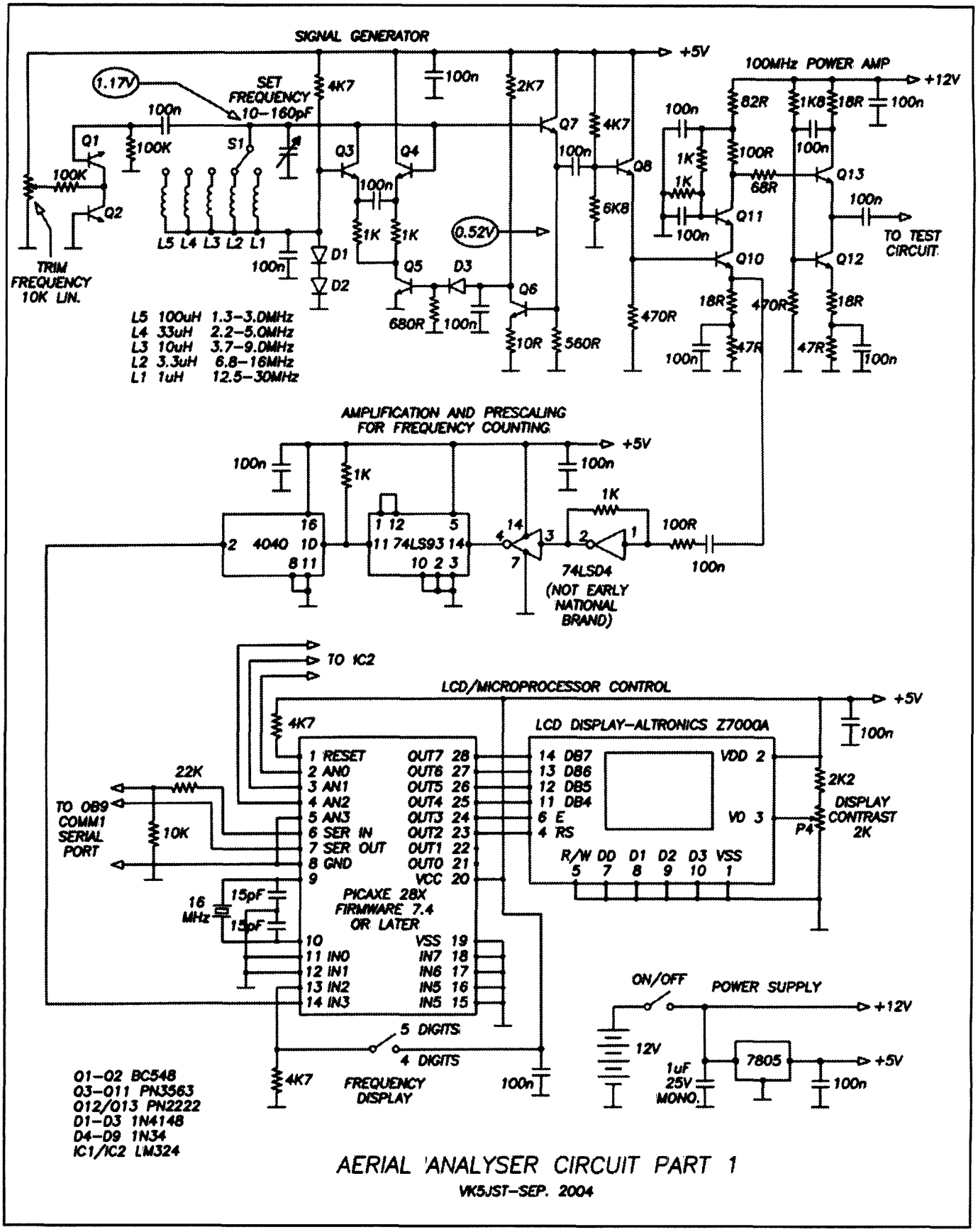


Fig 2. Aerial Analyser circuit diagram part 1.

This, in turn, ensures that independent of the load applied to the test circuit, the calculations will have maximum accuracy. The sinusoidal output ensures that the measurement occurs only at a single frequency and is not upset by what happens at harmonics of the generator frequency.

These goals are attained by using an RF oscillator with an AGG circuit. Q3 and Q4 provide broadband gain (coupled collector to base then emitter to emitter), and the frequency of oscillation is set by the variable 160pf tuning capacitor and inductors L1 – L5. Fine tuning is provided by back to back varicap diodes fabricated from the reversed biased collector base junctions of Q1 and Q2. The level of oscillation is set by the current flowing through Q1 and Q2, which in turn is set by the AGC circuitry Q5 and Q6. At switch-on when there is no oscillation, the 2k7 resistor in the collector of Q6 turns Q5 hard on causing maximum current through Q3 and Q4, and hence rapid build up of oscillation. As the oscillation increases, Q6 collector potential falls, starving Q5 of base potential and hence limiting the current through Q3 and Q4. This process stabilizes the level of oscillation. AGC action is excellent – the AGC amplifier Q5 has a gain of over 200 – and the result is a very constant level of oscillation at the emitter of Q7 of around 600 mV p-p.

This output is then buffered and amplified by a wideband power amplifier, comprising Q8 through Q13. The amplifier provides a voltage gain of 5, and an output impedance of a few ohms to drive the test circuit with around 3 V p-p. The emitter follower Q8 provides a low impedance drive to a cascode voltage amplifier Q10 and Q11 (the cascode structure eliminates Miller effect and ensures a very wide bandwidth). These transistors in turn drive an emitter follower Q13 with active pull down Q12, ensuring equal current source and sink capabilities. The 100 MHz bandwidth ensures the RF drive level to the test circuit remains ruler flat to 30 MHz.

Drive for the frequency counting function of the microprocessor is stolen from the emitter of Q10, and is amplified and buffered using a 74LS04. This is then divided by 1024 in the 74LS93 and 4040 following.

Dual gating intervals are provided for frequency counting of around 0.1 sec and 1 sec under the control of a logic level on pin 13 of the microprocessor. The rapid gating interval allows the user to "track" and easily set the generator frequency, while the longer gating interval allows the accurate frequency measurements which are sometimes necessary.

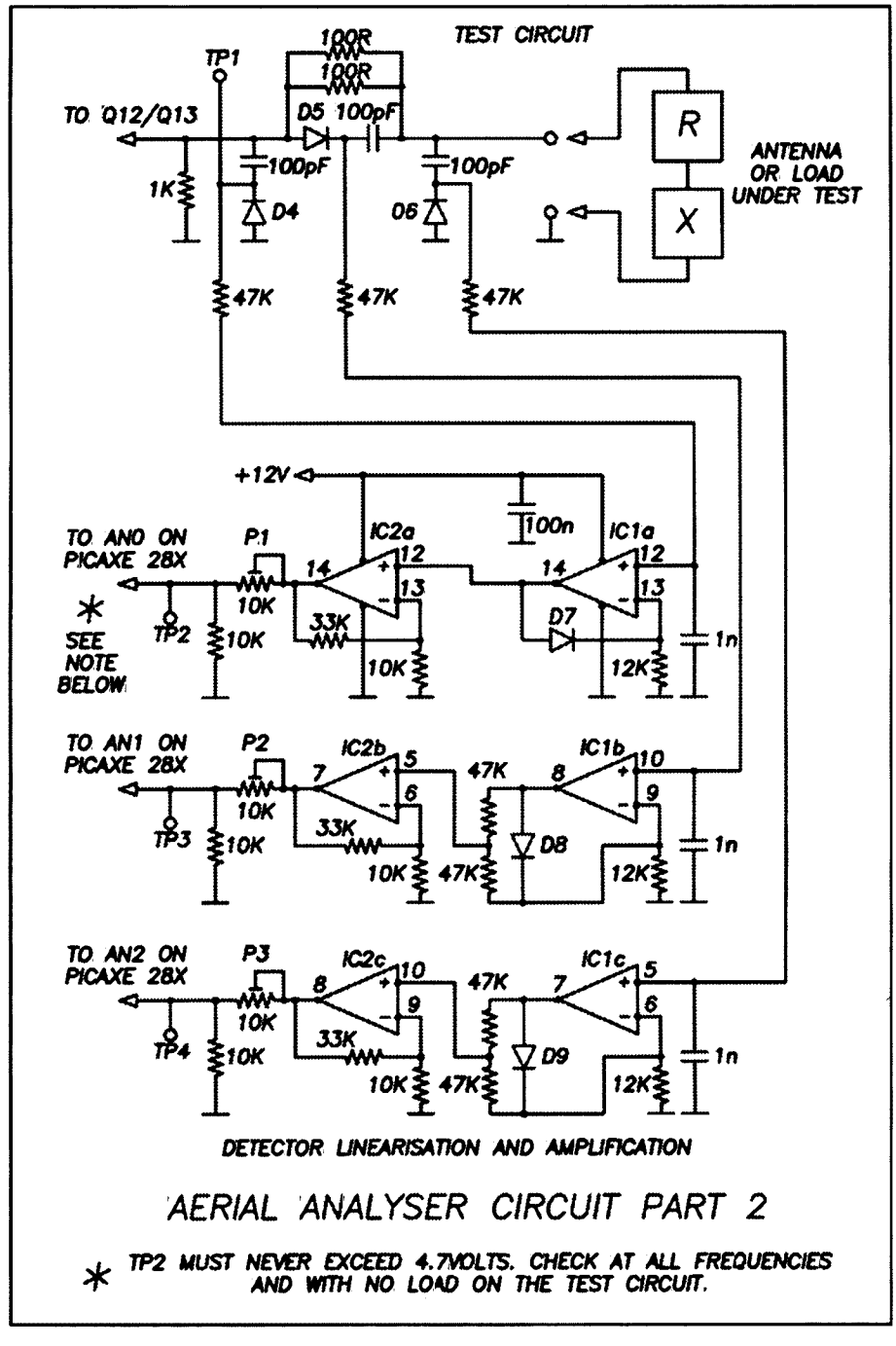


Fig 3. Aerial analyserr circuit diagram part 2.

The 3 voltages discussed previously in the "Theory" section are derived from the test circuit using germanium diode envelope detectors. Note that only point contact germanium diodes can be used here (D4 – D9) as despite what the schools teach, germanium diodes have a zero turn on potential provided the load resistance they drive is high enough (in this circuit around 50 megohms). This is not the case with silicon diodes (with turn on potentials around 500 mV) or even with the best "zero bias" hot carrier diodes which actually have turn on potentials of around 100 mV. For VSWRs of around 10 (a 5 ohm load on the test circuit) only about 150mV peak will be applied to D6. For accurate calculation, it is very

important to have linear detection. Even with germanium diodes, the bottom end of the detector characteristic is very non-linear and must be linearised somehow. This is achieved by using the diode characteristic against itself in negative feedback loops around IC1a, b, and c. By the way, 1N34 diodes are readily available from Aztronics Pty. Ltd., in Adelaide. Alternatively OA91s can be used, but do not mix types.

The three resulting DC voltages are applied to the A/D converter inputs of the microprocessor where much software muscle is then applied to produce the relevant displays.

Making the unit

Unfortunately, there is no way that a single sided PCB can be used for this project, as an excellent RF ground is necessary.

To make the board, the track pattern is transferred to one side of the PCB using one of the photographic processes available, and Riston coated PCB. Alternatively, it can be transferred using a photocopier, clay based photo paper, and a hot steam iron (see Silicon Chip Feb 2001) or Jaycars Press'n'Peel film and a steam iron (Silicon Chip April 2004). The other side of the PCB is protected during etching by covering it completely with Contact film (as used to cover school books). By the way, if either of the last two methods of manufacture is used, the track image published will have to be horizontally "flipped" to be useful. Note that all artworks and software for this project are available on the author's web site (see the "On the Internet" section of this article.)

The board is etched, turned over, and the Contact removed. It is then counter-drilled using a 1/8th inch (3.2 mm dia.) drill to insulate component leads from the ground plane. Note that some holes are not counter-drilled (see ground plane pattern) to allow the earthing to the ground plane of various parts of the PC track pattern via wire links. Finally the board is carefully cleaned and dried, and protected against attack by spraying it with one of the proprietary solder-through spray lacquers (Electrolube or similar).

The instrument case is then fabricated. The drilled PCB can be used as a template to accurately mark and drill the box front panel for all terminals, mounting pillars and switches. After this is done, carefully use a wood chisel to remove the internal reinforcing ribs at either end of the Jaycar box specified, so that the battery holder will fit.

The components are then mounted on the PCB starting with the lowest profile items and working upwards. As mentioned previously, use only one diode type for D4-D9, and also only transistors with identical type numbers for Q3-Q7. Use IC sockets. This allows progressive testing of the circuitry rather than the "apply power to everything and hope" approach. Check all your soldering and components very carefully, particularly those which will appear under the LCD when mounted.

Soldering the LCD into position is a bit of a trick, and I would suggest that you correctly position the display first relative to the PCB by using 6 mm thick polystyrene foam as a spacer, and two lengths of 0.5 mm dia. TCW at either end of the LCD pinout. The display is locked into final position by soldering both ends of each wire. Having correctly positioned the display, you can then make all the other connections between PCB and display by dropping short lengths of 0.5 mm TCW through the matching hole sets, soldering, and then trimming off the excess - use of 0.5 mm wire is highly recommended as this will allow the LCD to be hinged away from the main PCB in the event of an error. The next thing to be done is to cut the hole in the front panel for the LCD. The back of the Jaycar box has a rectangular marking-out grid moulded into it which greatly assists this process. Stick four pieces of Blu-Tack on the rear of the front panel roughly where the corners of the LCD will be and then using the main switch shaft and front panel hole for it as a locator, press the LCD corners into the Blu-Tack. Remove the PCB, mark out a rectangle on the rear of the front panel using a sharp knife and the Blu-Tack data and cut the hole for the LCD.

The board is then mounted on the front panel. It is supported at one end using countersunk screws and 10 mm long nylon spacers, while the other end is supported by the two test terminals. The two C&K switches are fitted and the front panel label then stuck to the front panel using double-sided adhesive tape. The bottom of the case will need to be relieved so that the knob on the main tuning capacitor can protrude from the side of the case. Likewise the case

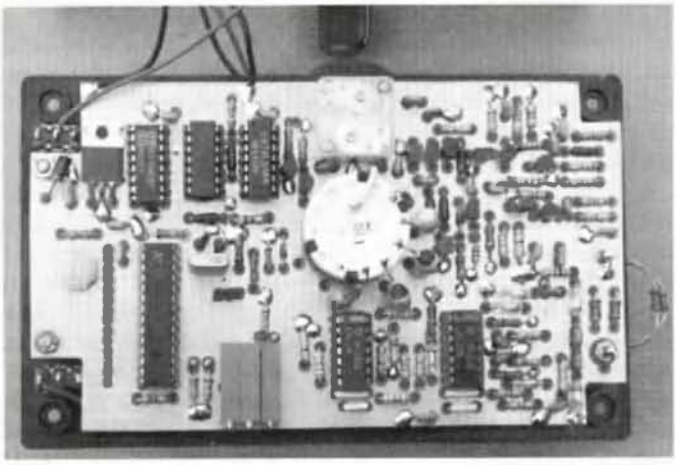


Photo 2. View of the Aerial analyser PCB from the component side.

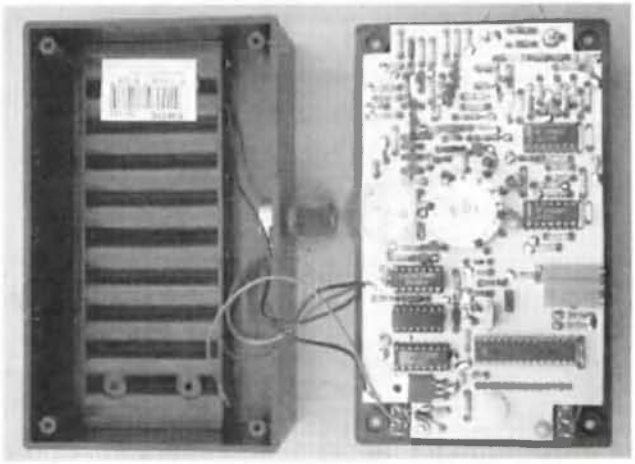


Photo 3. The Aerial Analyser board out of the case.

bottom must be drilled to accommodate the miniature fine-tuning potentiometer which mounts next to the batteries in the case bottom. This completes all work on the case.

Set up and testing

With all ICs unplugged, apply 12 volt to the PCB. Check the output of the 5 volt regulator with a multimeter (4.75- 5.25 Vdc). The top line of the LCD should display all black squares (or perhaps total garbage) when the display contrast pot is varied. Use an oscilloscope fitted with an X10 probe to monitor the emitter of Q7. A clean sine wave at a level of 600 mV p-p +/- 10% should be present, independent of the frequency selected. With the "TRIM FREQUENCY" pot set centrally, the main tuning capacitor set to minimum, and the 12.5 to 30 MHz range selected, use the trimmer on the main tuning capacitor to set the output frequency to 31 MHz. Now check the frequency coverage on all ranges. Set the frequency to about 2 MHz and monitor the emitter of Q13 (or the hot output terminal) with the CRO probe. With no load on the test circuit, around 3 V p-p of clean sine wave should appear here.

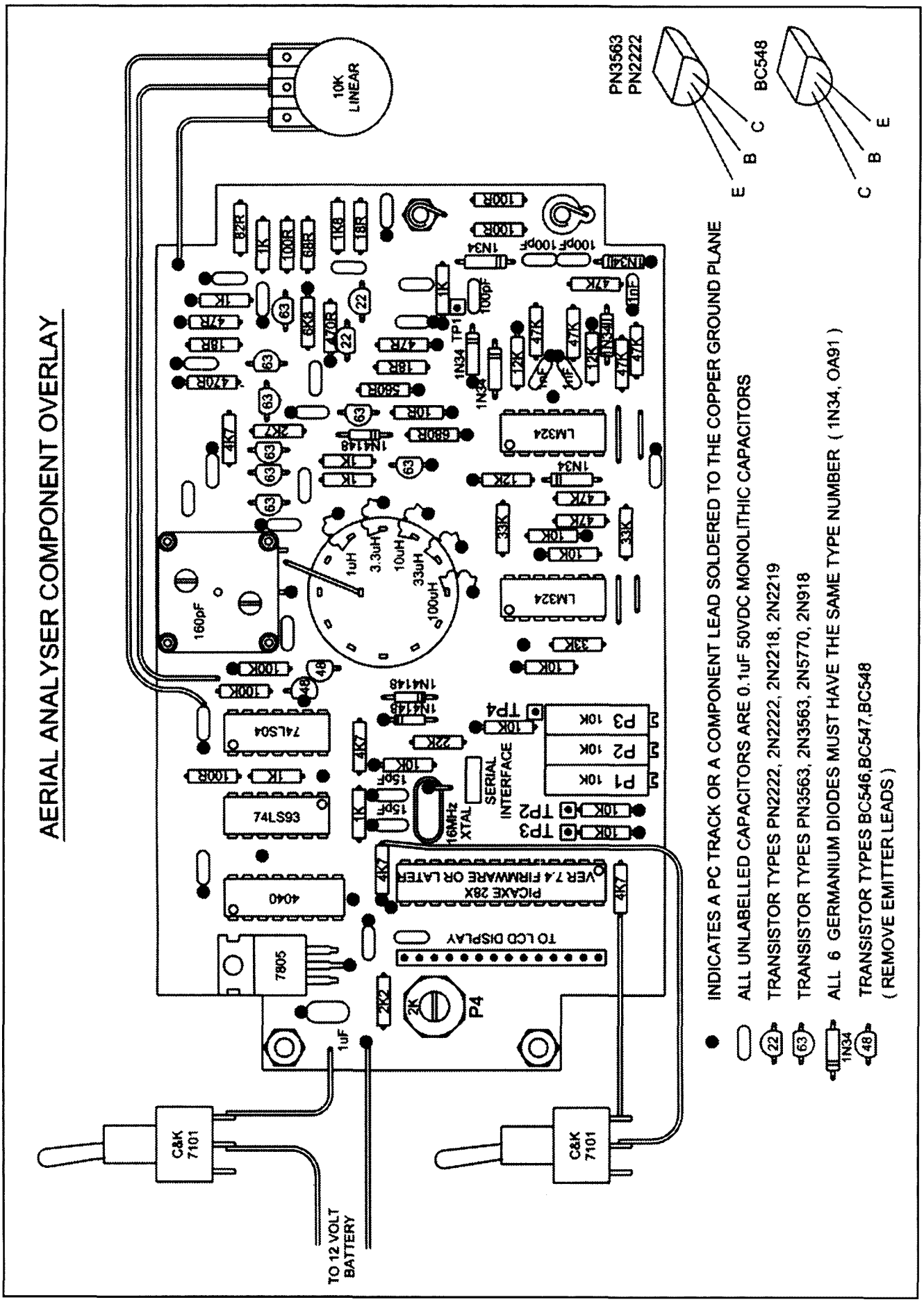


Fig 4 . Aerial analyser printed circuit board component overlay.

Plug in the 74LSO4, 74LS93, and 4040. Around 2 kHz of 5 V p-p square wave should be present at pin 14 of the PICAXE 28X if the pre-scaler is working correctly. Check pre-scaler operation (divide by 1024) on all other frequency ranges and then re-set the frequency to around 2 MHz. There may be a problem here. Some manufacturer's 74LS04 chips are notably slow and low on gain when used as linear inverters. No problems have been experienced with chips from Texas Instruments (SN74LS04), Hitachi (HD74LS04), and Fairchild (F74LS04), but there are problems with early date code batches (middle to late 1980's) from National (DM74LS04) and Mitsubishi (M74LS04). Check with your scope and X10 probe at the output of the second inverter for a 3 V p-p "square" wave at 30 MHz min. if there is a problem. Similarly, some 74LS93 chips do not meet industry wide speed specs. The 74LS93 has a minimum published clock rate of 32 MHz, and apart from the 74LS196 which is not readily available, is fastest counter in the 74LS family. Again, no problems have been experienced with TI, Hitachi, and Fairchild. But all of this is an excellent reason to use IC sockets. It will save hacking your PCB around if there are problems. DO NOT use any other logic family, e.g. 74, 74F, 74HC, etc. None of these will work with the published component values, and the 74F/74HC families will not work as stable wideband linear inverters under any circumstances. And yes, the author is aware that the 4040 is being used slightly above the minimum published clock rate at 5 volts, but the chip is being used with only one standard load (not 10 standard loads at which the testing is done). Furthermore, the maximum clock rate applied to the chip is 1.875 MHz , and no chip of any brand tested so far, has been slower than 6.5 MHz. The reason for using the 4040 is simply to save precious battery power.

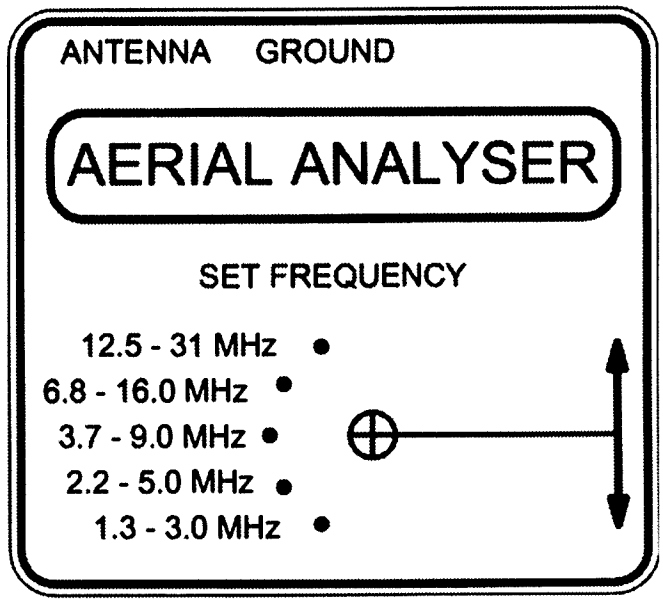


Fig 5. Front panel label for the Aerial Analyser

Plug in both LM324s and connect two 100 ohm 1% ¼ watt metal film resistors across the test terminals (50 ohms). Monitor TP2 with a DVM and adjust P1 until a DC voltage of exactly 4.50 volts appears. Then adjust P2 and P3 until exactly 2.25 volts appears at TP3 and TP4 when checked with the DVM. This completes calibration.

Loading the microprocessor

In comparison to almost everything else on the market, loading PICAXE code is beautifully simple. First you must make up a 3-wire cable to connect the COM1 serial output port on your Windows computer to the input connector on the PICAXE. See the PICAXE website www.rev-ed.co.uk/picaxe/ for details. The incredibly complex two-resistor

Parts list

Resistors (all 0.25W 5%)

1 @ 10R
3 @ 18R
2 @ 47R
1 @ 68R
1 @ 82R
4 @ 100R
2 @ 470R
1 @ 560R
1 @ 680R
7 @ 1K
1 @ 1K8
1 @ 2K2
1 @ 2K7
4 @ 4K7
1 @ 6K8
7 @ 10K
3 @ 12K
1 @ 22K
3 @ 33K
7 @ 47K
2 @ 100K

Pots and trimpots

1 @ 10K linear 16mm pot. and knob
3 @ 10K multiturn cermet trimpots Jaycar RT 4614
1 @ 2K trimpot Jaycar RT 4356

Capacitors

2 @ 15pF NPO 50V ceramic
3 @ 100pF 50V ceramic
1 @ 160pF variable cap. Jaycar RV 5728
3 @ 1nF 50V ceramic
19 @ 0.1uF 50V monolithic
1 @ 1uF 50V monolithic

Inductors

1 @ 1uH RFC Jaycar LF1510
1 @ 3.3uH RFC Jaycar LF1516
1 @ 10uH RFC Jaycar LF1522
1 @ 33uH RFC Jaycar LF1528
1 @ 100uH RFC Jaycar LF1534

Semiconductors

2 @ BC548 or equiv.
8 @ PN3563 or equiv.
2 @ PN2222 or equiv.
6 @ 1N34 or equiv.
3 @ 1N4148 or equiv.
2 @ LM324
1 @ 74LS04- see text
1 @ 74LS93- see text
1 @ 4040
1 @ 7805
1 @ PICAXE 28X (with ver.7.4 or later firmware to support 16 MHz clock and 256 gosubs)

Hardware

1 @ liquid crystal display Altronics Z7000A
2 @ C&K type 7101 SPST switches or equiv.
1 @ 12 position single pole min. rotary switch and knob
2 @ 10mm long 3mm bore nylon standoffs
1 @ red 4mm binding post terminal Jaycar PT0453
1 @ black 4mm binding post terminal Jaycar PT0454
4 @ 14 pin DIL IC sockets
1 @ 16 pin DIL IC socket
1 @ 28 pin DIL IC socket
1 @ 10X AA battery holder Jaycar PH9210
8 @ AA zinc carbon batteries (or 10 alkaline)
1 @ Jiffy box Jaycar HB6011
1 @ PCB
1 @ front panel label
1 @ 16 MHz quartz crystal
miscellaneous 3mm screws and nuts, hookup wire, insulated sleeving, pc pins, solder

On the Internet

Coding for the PICAXE 28X microprocessor, and the masters for the printed circuit board, are now available at http://www.users.on.net/~endsodds/

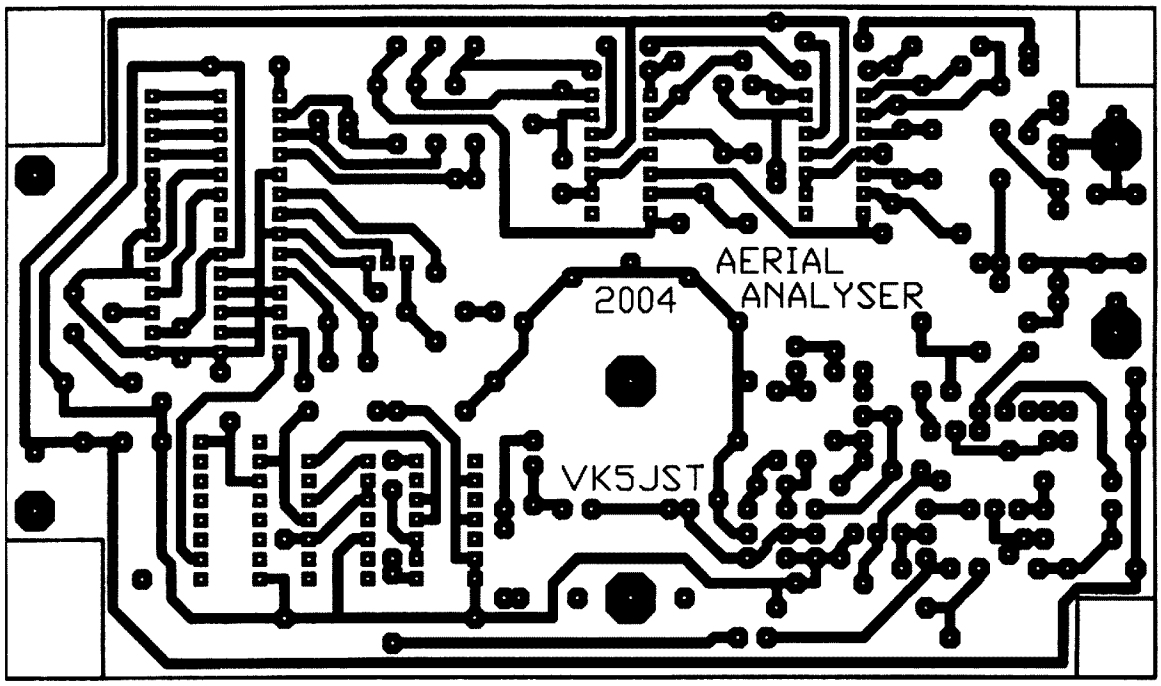


Fig 6. Printed circuit board track pattern.

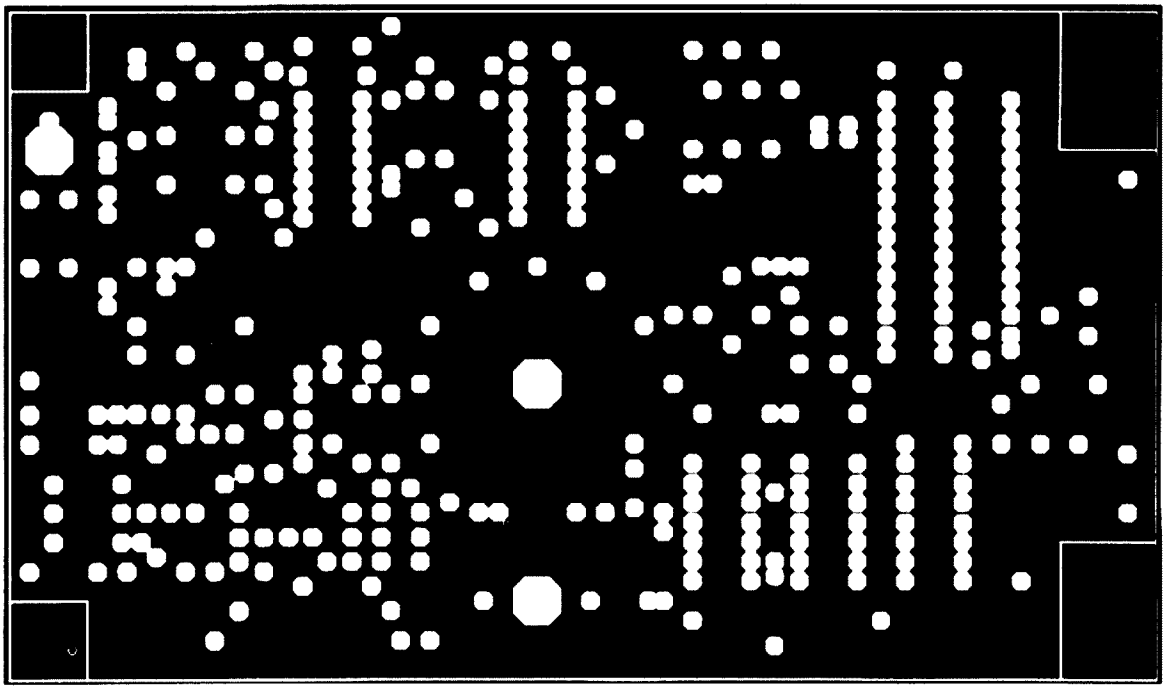


Fig 7. PCB ground plane, printed in the negative.

interface for the micro is included on the PCB.

Next you must download the 19 Mb file BAS805.EXE from the website. When expanded in Windows, this file provides the Programming Editor, used to load data into the EEPROM of any of the Picaxe chip family.

Last, download the file 5diganlsr. has from my website and put it into the folder containing the Programme Editor.

Open the Programming Editor, select the PICAXE 28X chip with 16 MHz clock rate and 256 gosub options, and open the file 5diganlsr.bas. Connect the 3-wire cable from COM1 to the PICAXE interface connector of the PCB, switch on power to the PICAXE, and select RUN in the Programming Editor. The code will now be squirted into the EEPROM in the micro if all is well.

Your analyser should now be alive! It should be displaying a 4 or 5 digit frequency of around 2 MHz, R=050 ohms, X=000 ohms, and SWR=1.00. Recheck all your calibrations and the battery drain (around 100 mA total). Depending on the circuit conditions for which your crystal was made, you may wish to slightly change the count periods specified in the "count" statements in the software so that the analyser shows the correct frequency. Connect a 300

Amateur Radio Magazine Awards 2004

The Higginbotham Award

The Higginbotham Award for service to amateur radio generally, not necessarily to the magazine goes to Drew Diamond VK3XU for his service to the hobby of amateur radio with the excellence of hs contributions to Amateur Radio magazine.

He writes on a variety of subjects.

All projects come with the reputation that if Drew designed and built it, it works.

The Amateur Radio Technical Award

The Amateur Radio Technical Award for the best technical article published in 2004 goes to Dale Hughes VK2DSH for a series of articles published throughout the year, in particular "A high performance 1 kHz to 25 MHz signal generator" published in February 2004.

An experimental HF antenna analyser *continued*

mm length of hook up wire between the test terminals and select a frequency of around 30 MHz. Depending on the wire diameter, the skin effect resistance will be around 4-10 ohms and the inductive reactance around 80 ohms. When the wire is disconnected the instrument will display the reactance and loss resistance of the few pF of stray capacitance in the test circuit and will not indicate an open circuit until the frequency falls below 25 MHz. However, the reactances of these strays are very large in comparison to antenna impedances and can be ignored in any practical measurement.

Warts and precautions

The processor used in this project does not provide either advanced arithmetic functions, or floating point arithmetic, meaning that all arithmetic has to be done from first principles and using integer numbers either between 0 and 255, or 0 and 65535. This causes "lumpy" calculations, which become less accurate as the measured impedance moves away from the 50 ohm calibration point, and as one set of calculated results is used to derive others (SWR is calculated from R and X). Despite these factors, the instrument offers accuracies of better than 10% with accuracy improving as 50 ohms is approached. The little beast is therefore not a laboratory instrument, but rather a design aid, like a dip meter.

On another tack, the presence of interfering signals should always be kept clearly in mind. In the author's location (with an underground mains supply) 30 metres of long wire antenna only produces a few millivolts peak of 50 Hz hum in the test circuit, which does not upset calculations. However, in locations near overhead high voltage lines, hum pickup may possibly become a problem, and can be dealt with either by placing an RF choke directly across the instrument terminals or a capacitor (0.1 µF) in series with the antenna under test. At the low frequency end (1.5- 6 MHz) a value of 1 mH is suggested, while 100 µH should be used for higher frequencies (watch out for unwanted resonances!). Of course, the balun necessary for measurements on balanced antenna systems will completely eliminate the 50Hz problem. Unfortunately, no such quick and dirty fix exists for RF interference. With this in mind (and in the interests of linear detection), the output from the RF signal generator was made as large as possible, consistent with reasonable battery life. You will have to be quite near a transmitter for it to seriously compete with the 1.5 volts peak applied to a 50 ohm load, but nonetheless, bear interference in mind at all times.

One other problem which should be firmly kept in mind is that aerials can attain very high voltages due to static charges from wind action. Always ground the antenna first before connecting the Aerial Analyser, to avoid damage to the instrument.

Acknowledgements

One of the tasks accomplished by the Greek hero Hercules, for which he was justifiably famous, was the cleaning out of the stables of King Augeias. Barry Williams VK5ZBQ, undertook a similar task when he waded through the authors initial circuits, component overlays and software to make a second prototype. While doing this, he eliminated a lot of very bad blunders and made suggestions which greatly improved the instrument. Thanks Barry.

ar

Unravelling the mysteries of connecting radios to antennas. Part 2

Transmission lines, filters, baluns and couplers

Brian Clarke, VK2GCE
brianclarke01@optusnet.com.au

Transmission lines

The main point from the previous section is that when we try to use a fairly simple antenna – a horizontal or vertical dipole or ground-plane configuration – over several amateur bands, Z_{AE} will vary quite considerably. It will be resistive at a few points and reactive at all others.

To progress the discussion, I will assume for now that we connect our transmission line (or feed-line) directly to the feed point of our antenna. We have a choice of transmission lines – balanced or unbalanced.

Balanced transmission lines

A pair of wires, of the same dimensions and covering, held apart so they don't arc at voltage nodes and twisted so that any capacitive effects of nearby conductors will affect each wire approximately equally, constitutes a parallel, open wire, balanced transmission line. A simplified equation for the characteristic impedance of this transmission line is given by:

$$Z_0 = 276 (\log (2s / d)) / \sqrt{\varepsilon}$$

where

ε = the dielectric coefficient of the insulating material between the wires

s = the spacing between the centres of the wires

d = the diameter of the wires

Using round wires held closely together in air (s = d, ε = 1), we could be forgiven for believing that Z_0 becomes 83 Ω. However, the formula above is an approximation, and as s approaches d, Z_0 actually approaches zero. If we insulate the wires, s increases a little and the impedance will rise. When s = 1.075d, Z_0 is very close to 50 Ω.

The practical problem is how to maintain that exact spacing. This can be done by sleeving one of the pair of wires and taking the dielectric coefficient ε of the sleeve material into account. The trouble is that most sleeving materials shift the impedance too high. To overcome this you could cut slots in the sleeve so that the effective dielectric coefficient is lower, but the results from this technique are very difficult to control.

If instead of round wires we use oblong cross-section wires, with the longer sides of the oblong parallel to form a flat strap, we can get a more controllable and lower characteristic impedance:

$$Z_0 = 138 (\log (4s / w)) / \sqrt{\varepsilon}$$

where

s = the spacing between the wires

w = the width of the wires

or if w >> s

$$Z_0 = 377s / w\sqrt{\varepsilon}$$

Using this arrangement, we can get a Z_0 as low as 25 Ω quite easily. But a transmission line of this construction is rather impractical for use in feeding a dipole located tens of metres in the air.

Another way of getting a lower Z_0 is by running two sets of parallel open wire feeders in parallel, although making the spacers to keep four wires evenly spaced is a nice afternoon's work. This form of transmission line is less likely to be unbalanced by stray capacitive effects to conductors nearby.

With greater spacing, practical characteristic impedances of 150 Ω to 1,000 Ω are quite achievable.

In air, the breakdown voltage is about 1 kV per mm; this may fall under high humidity. If we were to roll our own 600 Ω line from say 14 gauge wire, the spacing between the conductors would be about 125 mm. For a power level of 1 kW, and a perfect VSWR of 1:1, the voltage between the conductors, given by $V = \sqrt{(PR)}$, is 775 V. We could run to a VSWR of 161:1 before voltage flashover occurred, though the cable would have melted due to excess current before that.

Unbalanced transmission lines

If we use a pair of parallel conductors, one of which is always exposed to a variety of other conducting objects (eg, handrails, gutters, down-pipes, the earth and tower uprights), whilst the other is always kept a fixed distance from the first conductor but not exposed to any other conducting objects, we have a recipe for an unbalanced transmission line. A readily available form of this is the coaxial cable. A simplified formula for the characteristic impedance of this transmission line is given by:

$$Z_0 = 138 (\log(D / d)) / \sqrt{\varepsilon}$$

where

ε = the dielectric coefficient of the insulating material between the conductors

D = the inside diameter of the outer sheath conductor

d = the outside diameter of the inner wire

Practical values of Z_0 for air-insulated coaxial cables run between 50 and 150 Ω. When polyethylene or polytetrafluoroethylene (PTFE) is used as the insulator, the most readily available coaxial cables have Z_0 ranging from 50 to 95 Ω. Values outside these ranges are possible, but usually quite expensive. Rolling your own is not on.

If we want lower values of Z_0, we can run two coaxial cables in parallel, tying both inners together, and separately, both outers together, at both ends. But

the costs and losses will be doubled. It would be better to use an unbalanced-to-unbalanced transformer (unun) to transform the impedance.

At the power levels commonly used by radio amateurs, flashover is unlikely under normal (ie, VSWR = 1:1) conditions. Using the formula $V = \sqrt{(PR)}$, and inserting 400 W and 50 Ω, we get V = 141 V. If we were to use RG-58 cable which has a maximum operating voltage of 1,900 V, we could operate at a VSWR up to 13.5:1. However, the maximum current at the current nodes would be 38 A, which would likely melt the cable. The closer we operate to the maximum capability of any transmission line, the less room we have for high VSWR; eg, during tune-up or when accidents have occurred to our antenna.

Using second-hand coaxial cable is fraught with danger – unless you have specialised test equipment, you cannot tell whether:

- the cable is full of water, changing the dielectric coefficient
- the outer braid has been flexed to near breaking point
- the inner conductor has been very warm, softened the insulation and changed the internal dimensions and hence the impedance and/or flashover voltage

Matched transmission lines

We know from the Jacobi theorem that if the transceiver, transmission line and antenna impedances are the same, there will be no standing waves on the transmission line. That is, all forward power is absorbed by the antenna and none is reflected back to the transceiver. This means that arc-overs or instances of melting are unlikely, provided we don't exceed the cable manufacturers' ratings. It also means that the length of the transmission line is unimportant – true or false?

Not true: there are always losses in any transmission line – the main ones are ohmic losses in the resistance of the conductors, and dielectric losses. These losses are proportional to length and frequency. Figure 4, from the ARRL Antenna Handbook, shows some losses for typical transmission lines that radio amateurs might use.

These data are averages: some manufacturers' cables may be slightly different, and may vary between and within particular batches. Coaxial cables with foam dielectric generally exhibit lower dielectric losses than with solid dielectric.

You may wish to calculate the losses of your cable using the calculator at the url:
http://www.benelec.com.au/cables/cables.htm.

Enter frequency in MHz, click on the 'Calculate' button, and attenuation will be calculated for you.

Just as an example, say we choose RG-58 coaxial cable for operation in the 10 m band. The matched-line loss is about 2.6 dB per 100 feet; ie, around 45% of the input power is lost as heating over that length. If we change to RG-8 the loss over 100 feet is about 1.3 dB, or around 36 % heating loss. Compare this performance with that of open-wire feed-line where the loss over 100 feet is about 0.1 dB, or around 2.3 % – negligible.

Where do the losses go? They go into heating the cable. Over a long period of time, especially when operated

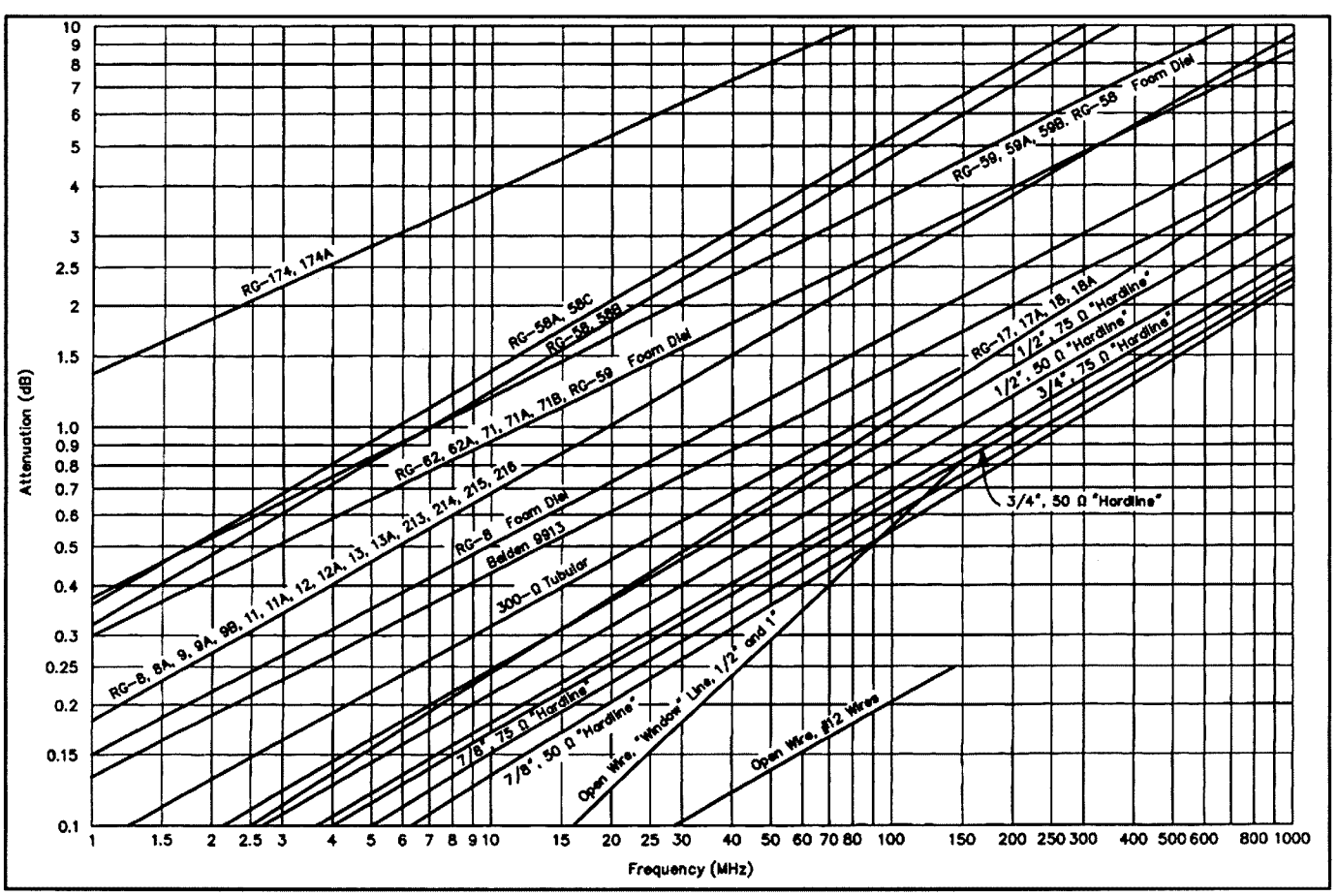


Fig 4. Loss in matched transmission lines vs frequency (Fig 26 from p24-18 of the ARRL Antenna Handbook 1991).

near their upper power limits, the conductors in coaxial cables may wander, which would lead to changes in local characteristic impedance, a rise in VSWR and a lower flashover threshold. Over time, coaxial cables can degrade, especially when exposed to sun and rain/ice.

Unmatched transmission lines

Generally we should aim for a VSWR of about 1:1. This is achieved when the antenna feed point impedance matches the characteristic impedance of the transmission line; ie, $Z_{AE} = Z_0$. In all other cases, some of the transmitter power is reflected by the impedance mismatch and travels back down the transmission line. This reflected power interacts with the forward power to create standing waves of voltage and current along the line.

The VSWR is the usual measure of the magnitude of the reflected power and therefore is also a measure of the inefficiency of the transmission system. VSWR ranges upwards from 1:1 for zero reflected power, to 1.5:1 for 4 % reflected power, to 2:1 for 11 % reflected, etc.

When the VSWR exceeds 1:1, we experience losses in addition to those described in the previous section, and the higher the VSWR, the higher these extra losses. High VSWR also increases the risk of transmission line damage through flash-overs or over-heating. Where does the increased power loss go? As before, into heating the cable and its environment.

If you are interested in finding out the increased loss you are likely to experience when the transmission line is not matched, have a look at "Unmatched Line Loss" in the *ARRL Antenna Handbook* (1991) p. 24-13.

In summary, we can see that coaxial cables are more lossy than open wire feeders, cost more to purchase, are very difficult to inspect for damage and can withstand much lower VSWR. The main advantage of coaxial cable is that it is easy to install – even if incorrectly.

How should we connect our transceiver to an antenna?

Let's have a look at each of the system components:

- Low pass filter (LPF),
- Balun/unun,
- Antenna coupling unit (ACU), and
- Transmission line (TL).

The low pass filter (LPF)

All transceivers have non-linearities. The manufacturers of transceivers often quote a figure of merit claiming how low (in dB below the carrier) any spurious emissions will be. If our antenna is resonant, its response follows the usual Q curve of any LC device, so frequencies away from resonance will be attenuated. However, the antennas we are considering exhibit multiple resonances corresponding to multiples of $\lambda/4$. If our antenna is non-resonant, or worse, resonant at spurious frequencies, then those unwanted signals would be radiated and received.

Most LPFs are symmetrical. This means that they reduce harmonics getting out of the transceiver and spurious antenna resonances getting back in.

LPFs work best at constant Z; ie, when the input and output impedances are the same.

Therefore, the best place for the LPF is just after your transceiver and before your ACU.

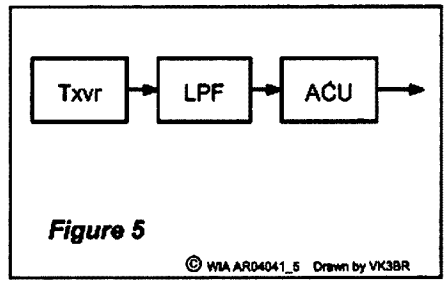


Fig 5. Where to place the LPF.

A few words of warning about LPFs

If you operate an LPF in a position where the VSWR is high, components inside the LPF could easily be damaged. For instance, in an LPF designed for 500 W on a 50 Ω line, the input and output capacitors would be chosen to withstand 158 VRMS, or 224 V peak, plus a safety factor of at least 15 %. Say the manufacturer's accountant has permitted the use of 300 V capacitors; what is the maximum VSWR you can safely tolerate when using the amateur's legal limit of 400 W?

400 W produces 141 VRMS in a 50 Ω line and this corresponds to a peak of 200 V. The 300 V limit is reached at a VSWR of 300 / 200 = 1.5:1. If you tune

up at say 100 W, the maximum VSWR sustainable is 300 / 100 = 3:1. If you want to keep your LPF without having to repair it, tune up at much reduced power and do the final tuning, at full power, only when the VSWR is safely below 1.5:1.

Knowing this limitation, you may decide to increase the voltage rating of the capacitors in your LPF. This would allow you to operate at a higher VSWR, but now the current-carrying capacity of the inductors may be exceeded. If the inductors are wound on ferrite cores, operating beyond the design current may cause core saturation and create non-linearity in the inductors; and this will generate harmonics in the transmitted signal.

If you damage the capacitors in the LPF, there may be no visible or sniffable sign and you may keep operating – but now, the final inductor in the LPF is part of the transmission line and will make the adjustment of any antenna coupler very difficult.

Next problem – how far can we wander from the frequency on which we have tuned up before we exceed a VSWR of 1.5:1? That depends on the impedance spiral of your antenna-plus-transmission-line (see Figure 2 in Part 1 of this article) and whether you have an automatic antenna coupler.

If you have a transceiver with a built-in automatic antenna coupler, putting an LPF in the output line from the transceiver exposes the LPF to considerable stress, particularly if the automatic coupler does its 'tuning' at full power. It is claimed that some built-in antenna couplers will suppress harmonics, so you would think you could operate without an external LPF. But usually the coupler is only in circuit when transmitting, so you forgo the protection from spurious antenna signals when receiving.

The Balun/Unun

Why would we want a balun or unun? The main reasons are:

- To provide impedance transformation – both the unun and balun can do this;
- To provide a balanced input to an antenna when all we have from a transceiver is an unbalanced output – only a balun does this;
- To prevent unbalanced currents from flowing in our transmission line – again, only a balun does this.

On this last point, see the article by Lloyd Butler VK5BR on unbalanced feed in *Amateur Radio* magazine, May 2004.

If you plug a piece of equipment, designed to run on 60 Hz mains, into our 50 Hz supply, the transformer runs very hot. Why is that? The inductive reactance of the primary winding, at 50 Hz, is nearly 17% lower than it should be, so the magnetising current is too high and tends to saturate the core.

When you plug a piece of equipment designed to run on 220 V mains into our 240 V supply, the transformer runs very hot. Why is that? Again the core tends to saturate because the magnetising current is too high, this time because the higher voltage pushes more current through the primary winding.

If the core gets sufficiently hot, it loses its permeability, so the inductance falls. Another major effect of core saturation is waveform distortion, which means the generation of harmonics.

If you connect the unun or balun after the ACU, you may be asking it to handle a wider range of voltage and current than those for which it was designed. If you run it in a reactive circuit, even though the power level may be correct, the voltage or current could be much higher than expected (see Figure 1 in Part 1 of this article) and exceed the design limits.

So, we need to run an unun or balun within the frequency, impedance and power ranges for which it was designed.

If you have a resonant antenna and therefore choose not to use an ACU, you may be able to use a unun or balun fitted at the antenna's feed point. This is fine. However, as discussed earlier, the losses in coaxial cable are a good deal greater than in an open wire line. So you may face a problem if your transceiver is designed only to feed coaxial cable. In this case use a very short length of cable, say to a balun on the outside of your radio shack, and then use open wire TL from there to the antenna feed point.

A multi-frequency example

Suppose you have an antenna whose feed point is elevated to 29 m because you want it to be at 0.18λ above ground for operation on 160 m, giving you a 50 Ω feed point impedance. You use a simple 1:1 balun at the antenna feed point, fed by 100 feet of RG-58 cable as your TL. Say you had a VSWR meter just after the LPF; on 160 m, the VSWR meter should read very close to 1:1, as you'd expect.

Now consider operation at the lower end of the 10 m band. The first effect is that the feed point impedance is likely to be closer to 72 Ω, but slightly reactive because it is a bit over an odd number of quarter wavelengths long. Now, recall the earlier example where we used 100 feet of RG-58 to feed our multi-frequency antenna. The second effect is that the cable losses will be much higher on 10 m than on 160 m. Because of these losses, the VSWR meter will read less than 1.4:1, and you will think that all is OK.

Next, say you decide to operate a bit higher in the 10m band; eg, 28.8 MHz. The antenna is now an even number of quarter wavelengths long and the impedance becomes very high. But, because of the losses in the coaxial TL, your VSWR meter will give a more optimistic VSWR reading than is actually the case. And the balun will be very unhappy indeed.

What to do? The best solution is to use an open wire TL from the antenna feed point down to an ACU that has a balanced output. Alternatively, fit an automatic or remotely controlled ACU (with balanced output) at the antenna feed point and run RG-58, RG-8, RG-213, Belden 9913 or ½" hard-line from the LPF to the ACU. These alternative cables are listed in order of increasing cost and decreasing loss.

Another HF example

Perhaps 160 m is not feasible for those of us on 1/5 acre blocks. Many local authorities allow a tower or mast that doesn't exceed 10 m height. This is pretty good for a 40 m horizontal dipole. Let's assume you can connect a balun at the centre feed point and choose to use RG-58 as your TL. So, if we install a 1.5:1 balun designed to operate at 50 Ω on the TL side and 75 Ω on the antenna side, the antenna will work well on 40 m.

What happens when we try to operate on the other amateur bands? Now, there may be only 15 m of TL from the transceiver or ACU up to the antenna, so the losses, even in the 6 m band, will be less than 0.5 dB. Such an antenna will present a very high input impedance on 20 m and 10 m, perhaps as high as 5 kΩ; and neither the balun nor the TL will be very happy, even if an ACU is used just after the LPF. This is what we must expect when operating on the even harmonics.

What to do? Once again, the best solution is to use an open wire TL from the antenna feed point down to an ACU that has a balanced output. Alternately, fit an automatic or remotely controlled ACU (with balanced output) at the antenna feed point and run unbalanced coaxial cable from the ACU down to the LPF.

What about working on the odd harmonics, ie, 30 m, 15 m and possibly 6 m? For 30 m, the antenna length is very nearly resonant, but the height is now 0.33λ and so the antenna impedance is around 96 Ω. For 15 m, antenna length is about right but the height is 0.66λ and so the antenna impedance is around 60 Ω. For 6 m, antenna length is about right but the height is 1.66λ and so the antenna impedance is around 70 Ω. In all these cases, the balun is not being presented with the correct antenna impedance and so the TL will have standing waves on it. But the maximum VSWR is likely to be 1.3:1, which the RG-58 can handle. Your transceiver may even accept that degree of mismatch and then an ACU would not be required.

The best place for a balun or unun is where there are constant impedances each side. This is likely to be before the antenna coupling unit, or directly into a single frequency, resonant antenna (see Figure 6).

The antenna coupling unit (ACU)

To minimise the losses in your system, particularly desirable if you are operating on very low power, the best place for

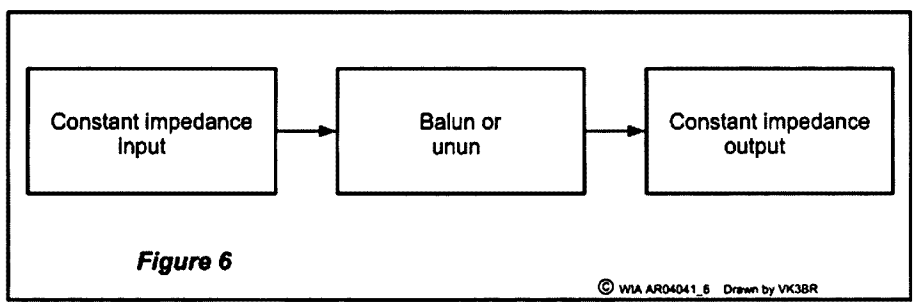


Fig 6 – Placement of balun/unun.

the ACU is as close to the antenna feed point as possible. (Some might say the best place is way outside the system.) However, we are trying to operate on as many frequencies as possible; so some form of ACU is necessary.

The ACU performs two major functions:

- it provides a conjugate impedance; and
- it transforms the impedance between the input and output.

What is 'a conjugate impedance'? Say your antenna presents a feed point impedance of 150 + j65 Ω. The ACU can be adjusted to provide –j65 Ω to cancel out the inductive +j65 Ω component. What now remains is 150 Ω; ie, a resistive load. The ACU can now be further adjusted to provide a 3:1 impedance transformation, so that the input can be fed with 50 Ω coaxial cable. In practice, both adjustments are done incrementally.

Most ACUs are so large and heavy that they would not be suitable for attachment to the centre of an antenna strung between two end supports. However, if the feed point is on a support, this is a good place for the ACU. Only remote-controlled or self-contained, fully automatic ACUs can be used in this fashion. If your ACU requires you to operate the controls manually, then it will need to be at the station or operating end of the TL.

If you are using an ACU at the antenna feed point and choose to measure VSWR at the bottom of the TL, coaxial feed line losses may present a problem. Your fully automatic ACU will have its own in-built VSWR sensing, so a measurement of VSWR at the lower end of the TL, in this case, can only be of academic value. Record these measurements anyway, as they could have diagnostic value if your automatic ACU, or the power supply to it, fails. When using a remote-controlled ACU, measuring the VSWR at the input end of the TL may not give optimum ACU settings because losses in the TL will cause optimistic VSWR readings.

There are several types of ACU designs available, either as store-bought or roll-your-own. Roll-your-own designs are to be found in most antenna books. The choices are:

- input – balanced or unbalanced
- output – balanced or unbalanced
- the range of compensation and transformation.

The advantage of a **balanced input** is that losses in the TL feeding the ACU are minimised. Balanced input is slightly more complex than unbalanced, and you are less likely to find a store-bought one sporting this.

The advantage of the **unbalanced input** is that relatively simple components can be used for the roll-your-own variety.

The advantage of a **balanced output** is direct connection to the antenna feed point, or connection to a low loss, open wire, balanced feed line. As with the input, balanced output is slightly more complex than unbalanced, but there is an even chance of finding a store-bought one.

The advantages of the **unbalanced output** are that

- it can be used with inherently unbalanced antennas, such as the quarter-wave ground-plane; and
- relatively simple components can be used for the roll-your-own variety.

A good ACU can compensate for a wide range of resistive and reactive impedances presented to its output: say 30 Ω to 5 kΩ resistive and 0 Ω to +/–5 kΩ reactive. With an unbalanced input and output, we don't need an unun; with an unbalanced input and a balanced output, we don't need a balun.

The transmission line (TL)

If the ACU has unbalanced input and balanced output, an unbalanced TL runs from the LPF to the input of the ACU, and the balanced output is connected to the antenna feed point via a section of balanced TL. This is the usual configuration when a manually operated ACU is used. See Figure 7a below. Consequently, as the unbalanced TL is fairly short, even if the balanced TL is quite long, the system losses are small.

If the ACU is an automatic or remotely controlled one, and is connected right at the antenna feed point, the main TL runs between the LPF and the input of the ACU; only a very short TL runs from the ACU to the antenna.

If the ACU is balanced at input and output, and the antenna is balanced, a balun is required at the output of the LPF (if it is unbalanced, as most are) and the main balanced TL runs from the balun to the ACU. See Figure 7b.

If the ACU is unbalanced to balanced and the antenna is balanced, no balun or unun is required but the losses on the unbalanced TL (coaxial cable) will be higher than in the previous example. See Figure 7c.

If the ACU is unbalanced to unbalanced and the antenna is balanced, then a balun is required between the ACU output and the antenna feed point, typically with a very short piece of TL each side of the balun. However, this is not a desirable architecture because the impedances on either side of the balun will change with each operating frequency.

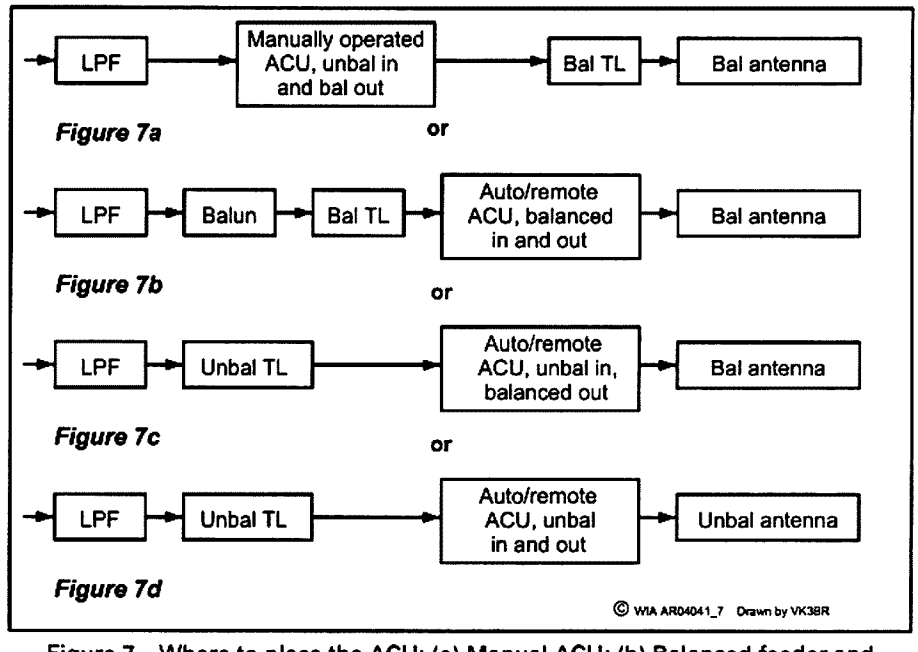


Figure 7 – Where to place the ACU: (a) Manual ACU; (b) Balanced feeder and balanced antenna; (c) Unbalanced feeder and balanced antenna; (d) Unbalanced feeder and unbalanced antenna.

Figure 7d shows the system arrangements for feeding a vertical dipole (unbalanced antenna) in a fixed or mobile application.

In general, the TL suffers less power loss if it is operated at its characteristic impedance; ie, with a VSWR of 1:1. As discussed earlier, a high VSWR causes:

- increased losses on the TL, and
- undesirably high voltages and currents,

both of which can shorten the life of your TL.

If there is a likelihood of operating the TL at other than its characteristic impedance, consider using an open wire feed line, where the losses due to high VSWR, and the likelihood of flashover or meltdown, are significantly less.

Bearing in mind the experimental work by Lloyd Butler VK5BR (*AR*, May 2004), it is better to feed balanced to balanced and unbalanced to unbalanced. Any mixing, for example, unbalanced to balanced, can result in:

- unbalanced currents on the TL,
- possible interference complaints from neighbours,
- tingly sensations when operating the PTT, and
- an unpredictable radiation pattern for your antenna.

Home-brewed open wire feed lines are much cheaper than coaxial cable. The only drawbacks with open wire feed lines are that they may need more maintenance, especially in high wind areas.

Summary of Part 2

1. Using two-wire TLs, Z_0 from 83 Ω up to 1 kΩ can be achieved. Lower values of Z_0 can be achieved by using stripline or four-wire TL techniques.
2. Unbalanced TLs, ie, coaxial cables, cannot be home-made. And only a few values of Z_0 between 50 Ω and 150 Ω are available.
3. Using second-hand coaxial cable is risky. It is quite difficult to discover damage to coaxial cables without good test gear.
4. For the impedances and power levels used by radio amateurs, VSWR-generated flashover is far less likely than meltdown. Heating of the conductors in a coaxial cable may permanently alter their spacing, affecting the Z_0 and local VSWR.
5. All TLs have losses. Coaxial cables have higher losses than open wire balanced TLs. Unmatched TLs have even higher losses. Open wire TLs are usually the better way to go.
6. Where should the various components of the antenna feed system go?
   - The LPF always follows the transceiver, unless it has its own built-in ACU – in which case, omit the LPF. If the transceiver has its own ACU, feeding its output into a (fixed impedance) unbalanced TL is unwise.
   - Match the type of TL to the type of feed; ie, balanced to balanced and unbalanced to unbalanced.
   - Use a balun to convert the transmission components from balanced to unbalanced, or vice versa. Always use baluns at constant impedance. Often the ACU contains a balun.
   - Try to get the ACU as close to the antenna as possible, matching the type of ACU to its input and output feeds.

References and bibliography

Sources used in Part 2 are:

- *ARRL Antenna handbook* (1991) though any recent edition should do
- *ARRL Handbook* – any recent edition should do
- Butler, Lloyd 'The EH antenna' *Amateur Radio*, May 2004, pp.18 - 22
- Kraus, John D. *Antennas*, McGraw Hill, NY, NY. (1988)
- *Radio Communication Handbook*, RSGB, Potters Bar, Herts, UK (1982) ch. 11 Propagation
- Shrader, Robert L. *Electronic Communication*, (5th edition 1985), McGraw Hill, NY, NY. ch. 20

ar

Part 3 of this article will appear in Amateur Radio, June issue

Round cable suppression cores

Ron Sanders VK2WB

The Autek Vector Analyzer VA1 is a small portable test instrument which combines a signal generator (0.5 – 30MHz) with the ability to measure SWR, Z, phase angle using source impedances from 25 – 450 ohms. Many other parameters are computed from the basic measurement and all readings are displayed on a 4 digit LCD meter.

With the VA1 it is possible to measure the effects of various types of suppression cores and so get an actual measurement of the impedance at any frequency from 0.5 – 30MHz. Since the cores are basically suited to 6.35mm and 12.7mm diameter cable it was decided to use the screen of RG-58 and RG-213 coax cable for the test section.

Test setup

Fig. 1 shows the test setup using a 32cm length of coax and up to 6 cores. By measuring the impedance of the screen itself at various frequencies and then adding cores, we can see the effect on the impedance measurement. The cores are centered on the coax for each measurement. The VA1 impedance was set at 50 ohms for all the tests.

Note that the impedance values for any single type of core can vary by +/- 20%, so the results should be used as a guide only

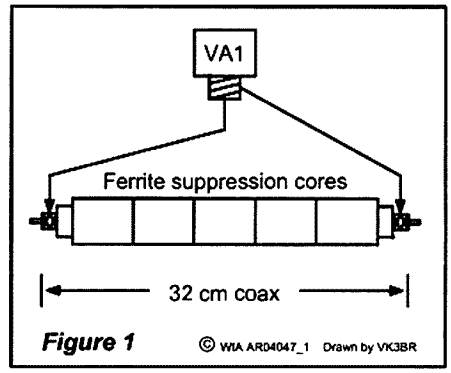


Figure 1

Fig. 2 shows how the attenuation is calculated from the results.

The common mode impedance (Zl) of the screen of the 32cm length of cable (NOT the characteristic impedance) is dependent on the frequency and is shown in the following tables alongside the frequency. Zg is always 50 ohms – the VA1 impedance. Zb is the factor due to the addition of suppression cores. The added impedance effect of the connecting leads (total 32cm) is deducted from the value of Zl. The tables show the corrected Zb values that relate to the coax only.

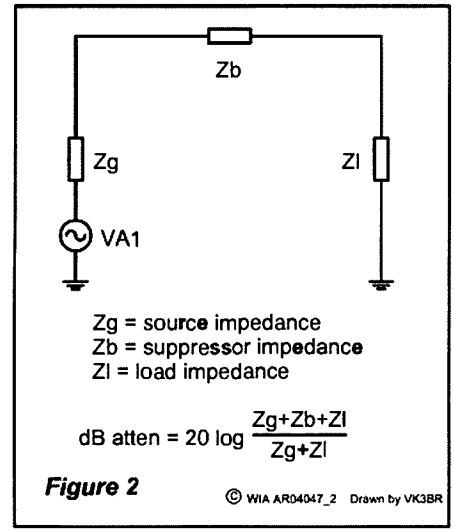


Figure 2

1. Results using RG-58 coax

Correction table for RG-58 coax by eliminating effect of connecting leads

Frequency	Leads + RG-58	Leads only	RG-58 only
MHz	Z Ω	Z Ω	Zl Ω
1.8	5	3	2
3.55	15	10	5
14.2	55	30	25
28.5	100	55	45

1.1 FB-43-5621 cores

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	40	65	95	115	135	175
3.55	5	65	115	160	205	250	315
14.2	25	150	295	395	490	590	700
28.5	45	175	265	290	310	325	345

1.2 FB-31-5621 cores

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	55	100	140	185	230	280
3.55	5	85	155	230	310	390	475
14.2	25	155	275	415	495	565	745
28.5	45	180	295	300	310	345	390

1.3 2X-43-251P2

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	25	65	85	115	135	160
3.55	5	50	115	150	205	240	295
14.2	25	125	260	375	495	540	640
28.5	45	200	295	305	325	370	395

1.4 2X-31-281S2

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	50	90	120	150	160	185
3.55	5	80	145	195	160	270	320
14.2	25	155	285	435	475	490	635
28.5	45	180	270	280	320	350	365

1.5 Analysis

In table 1.3 at 14.2MHz Zl is 25Ω and in column 6 (4 cores), Zb = 495Ω.

Therefore:

Attenuation = 20 log ((50 + 495 + 25)/(50 + 25)) = 17.6dB
And from the same table at 3.55MHz
Attenuation = 20 log ((50 + 205 + 5)/(50 + 5)) = 13.7dB
At 28.5MHz the attenuation drops to 12.9dB

Note that the results in tables 1.2 and 1.4 provide better attenuation (increased Zb) at 1.8MHz. This is due to the use of 31 ferrite material rather than 43 material.

2 Results using RG-213 coax

Correction table for RG-213 coax by eliminating effect of connecting leads

Frequency	Leads + RG-213	Leads only	RG-213 only
MHz	Z Ω	Z Ω	Zl Ω
1.8	5	3	2
3.55	15	10	5
14.2	45	30	15
28.5	85	55	30

2.1 2X-43-151P2

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	10	30	50	80	95	120
3.55	5	25	60	95	145	175	220
14.2	15	90	185	325	395	530	595
28.5	30	170	220	290	305	340	370

2.2 2X-31-181S2

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	10	15	40	45	70	80
3.55	5	20	25	70	80	120	140
14.2	15	70	90	190	230	325	365
28.5	30	150	195	280	295	315	320

2.3 FB-43-1020

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	45	80	115	150	180	215
3.55	5	70	130	190	255	320	385
14.2	15	155	285	415	455	580	765
28.5	30	160	245	270	285	325	345

2.4 FB-77-1024

Freq	No core	+1 core	+2 core	+3 core	+4 core	+5 core	+6 core
MHz	Zl Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω	Zb Ω
1.8	2	60	120	175	235	290	350
3.55	5	30	75	110	155	190	230
14.2	15	30	50	70	95	110	130
28.5	30	50	45	55	65	80	95

2.5 Analysis

In table 2.3 at 14.2MHz the cable only Z is 15Ω and in column 6, Z = 455Ω.

Therefore:
Attenuation = 20 log ((50 + 455 +15)/(50 + 15)) = 18.1dB
And from the same table at 3.55MHz
Attenuation = 20 log ((50 + 255 + 5)/(50 + 5)) = 15.0dB
At 28.5MHz the attenuation drops to 13.2dB

2.6 Making practical use of the data

The results show the effect of different ferrite materials and core sizes over the range of 1.8 – 30MHz. These figures are useful for making informed decisions on particular suppression requirements depending upon the frequency and cable diameter. The results can be applied to common mode suppression for a bundle of wires that fit the core. I don't know why the measured impedance at 28.5MHz falls below that at 14.2MHz after more than 2 or 3 cores are fitted, but that is the way it worked out.

All the results above are related to a source impedance (Zg) of 50Ω. If the Rg was 25Ω the attenuation is significantly improved. In section 2.5 the attenuation at 14.2MHz produced 18.1dB, but with Zg = 25Ω the attenuation would increase to 21.9dB. You can see that a low source impedance produces the best attenuation with a given suppression core setup. Unfortunately it is not always easy to determine the source impedance of the unwanted RF. It is common practice to fit a bypass capacitor to all non-signal leads leaving a piece of RF equipment. This is done to reduce the "source impedance" (Zg) of any internally induced RF on the leads so that any external suppression cores are more effective.

3. Core types

Note: All core types described here are manufactured by Amidon.

The following cores are only suitable for fitting to un-terminated cables:

FB-43-5621, FB-31-5621 are sleeves with an inside diameter of 6.35mm and will fit over RG-58 and RG-59 coax.

FB-43-1020, FB-77-1024 are sleeves with an inside diameter of 12.7mm and will fit over RG-213 coax.

The following cores are useful for fitting to cables that are already terminated with connectors:

2X-43-251P2 and **2X-31-281S2** are split cores with inside diameter of 6.35mm and include a nylon snap fit case to clamp around the cable.

2X-43-151P2 and **2X-31-181S2** are split cores with inside diameter of 12.7mm and include a nylon snap fit case to clamp around the cable.

The table below lists the recommended suppression range for each material.

Material	Recommended suppression range - MHz
31	< 500
43	20 – 250
77	< 2

Conclusions

The tests carried out on coax cable can be applied to any cable where suppression of unwanted RF is required. Suppression cores may need to be fitted at one end or both ends of a cable. In cases where the cable length may be resonant it could be necessary to fit extra suppression along the cable. Recently I was made aware of the need for suppression cores on guy wires of a mast due to the very strong induced RF current caused by an FM broadcast station located nearby. There was sufficient current to noticeably heat the suppression cores.

ar

"Paddyboard" circuit construction ~ *revised*

Drew Diamond VK3XU,
45 Gatters Rd.
Wonga Park, 3115.

Printed-circuit boards are routinely used for the cost-effective manufacture of consumer-electronics items - in their thousands. Their ubiquity may cause many of us to think that printed boards are the only way to build radio and electronics devices. Consider this: when we see an interesting circuit in a magazine, or wish to try a circuit of our own, it is usual for us to make just one. Serial number:- 1. Furthermore, our efforts do not have to pass inspection by the QA department, do not have to be automatically loaded by machine and wave-soldered - do not even have to look pretty. We simply want to get it working - pronto - without wasting precious hobby time in unnecessary effort.

A circuit board construction technique that is becoming increasingly popular with amateur radio constructors and experimenters uses appropriately sized pads of plain circuit-board material. No drilling or etching is necessary. Reliable operation- even for VHF circuitry is more readily obtained because the copper foil provides a continuous "ground-plane" beneath the components, and lead lengths can therefore be made very short, thus aiding circuit stability. Capacitance is about 4 pF per square cm for 2 mm fibreglass board. So, for dc, AF, HF and VHF work, the additional capacitance should not significantly alter circuit operation.

The example shown in Photo 1 is part of a three-band direct conversion receiver. Note how all components are fully accessible, even though the circuit board is fully installed in the receiver. Hence, any troubleshooting, experimenting, or later additions can be easily done with the board in-situ. And with a bit of practice, it can be made to look quite presentable too.

Scraps of single or double-sided board are hacksawed, guillotined, or tin-snipped to the size(s) required. Some examples are pictured in Photo 2. For applications involving ordinary transistors and passive components, squares of about 6 ~ 8 mm are suggested. Rough edges and burrs may be removed with a flat mill-file. According to authoritative opinion the dust from fibreglass board is not known to be hazardous. However, as with any

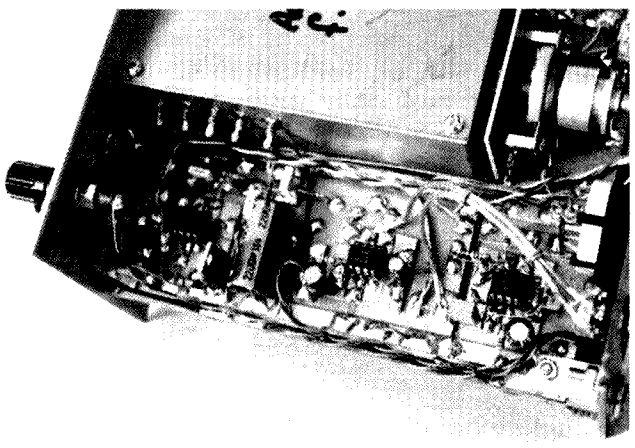


Photo 1 – Paddyboard construction.

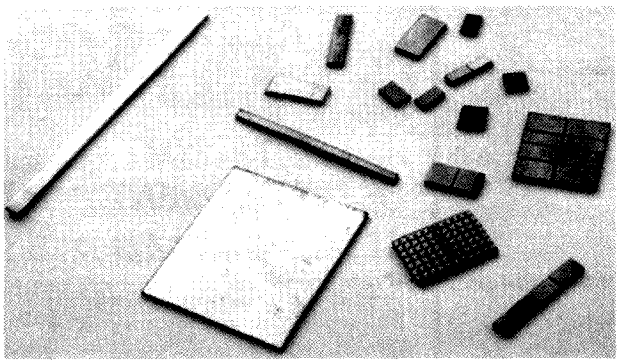


Photo 2 – Pads, strips and substrates.

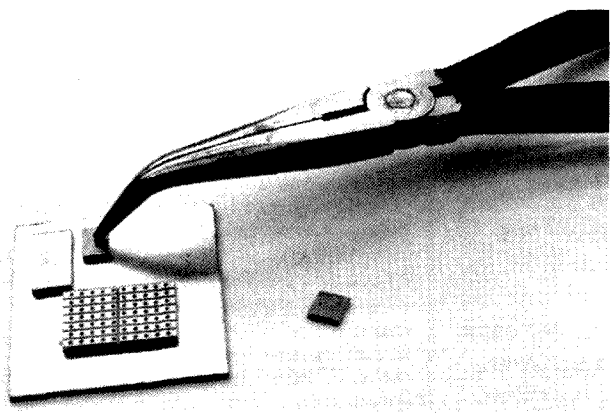


Photo 3 – Bent long-nose pliers as a "holder-downer".

dusty job: you should use a suitable mask (available from hardware shops) when cutting this material.

Pads, strips and substrates may be attached to the main circuit board with super-glue. Some grocers sell the Magic brand, which is dispensed from a small bottle, and applied with a tiny brush- much easier than a tube. The bottle may be re-filled from the cheaper tubes.

Both surfaces must be clean before the glue is put on. A tiny drop is applied to one side (fibre side for single-sided), and then the pad is quickly placed onto the board at the spot required. Photo 3 shows bent long-nose pliers in use as a "holder-downer" for the few seconds needed. Be sure the glue has set properly before the soldering iron is applied. If a pad needs to be removed later, carefully present a sharp pocket knife blade to the pad-board interface then snap it off the board.

For multi-leaded devices and components, we may use a "substrate" pad-board, sized accordingly. "Islands" or segments are formed by shallow cuts, whereby just sufficient copper is removed to create the individual islands. That shown on the right-hand side of Photo 2 will accommodate an 8-pin wire-wrap I.C. socket. Our substrate boards may be fabricated with the aid of a modeller's mitre box set (Photo 4)- available from model shops, complete with "back-saw" (so named, because it cuts on the back stroke). A "junior" hacksaw may also serve. The entire kit is shown in Photo 5.

When planning a circuit board from scratch, study the circuit, and then obtain those major components whose size and number will largely determine the board's size. To accommodate I.C.s, good results are obtained by using substrates made from suitably sized pieces of "Vero" board (visible in Photos 2 and 3), with a division cut along their length to separate the pins each side of the chip. An ordinary I.C. socket may then be soldered into the Vero, copper side up. Take care that the pins do not poke right through (and risk shorting to the board foil beneath).

For boards that will accommodate a largish number of components, supply rails (e.g. 6 and 12 Vdc) may be provided by strips of board made to run alongside the chief components, as illustrated in Photo 1, where the 12 V rail strip may be seen positioned along the lower edge of the board.

Having made all the necessary principal substrates, it is then possible to estimate the size needed for the main board. Draw the (estimated) area of the board first on paper. Place your substrates, pads, and strips upon the paper, then move the pieces around- chess fashion- to check that they will fit comfortably in the area available, and then record their position. A piece of circuit board material may then be cut to the required size.

Transfer the pads (no glue yet) onto the main board and replicate the layout. Now carefully lift each piece and super-glue it onto the board, as described above.

With the main pads and substrates in place, it is now possible to begin soldering the various components to their respective pads. Start with passives - resistors and capacitors, then discrete transistors, FETs and so on. I.C.s may be inserted in their sockets last. Small hook-up wire (or single-strand wire-wrap, or telephone wire) may be used for short links between pads as needed.

Leadless surface-mount components may simply be placed across cuts on a substrate board, or between pad(s) and main circuit-board foil.

Acknowledgments

The first known published circuit using pad-board construction is thought (by this writer) to be contained in an article in which a wideband solid-state amplifier is described by J Koehler,

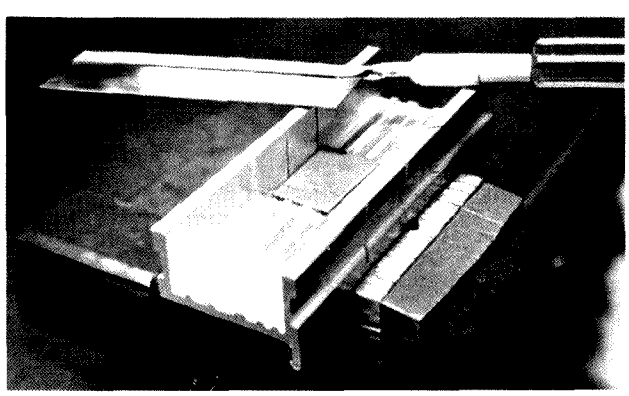


Photo 4 – Mitre-box and hacksaw.

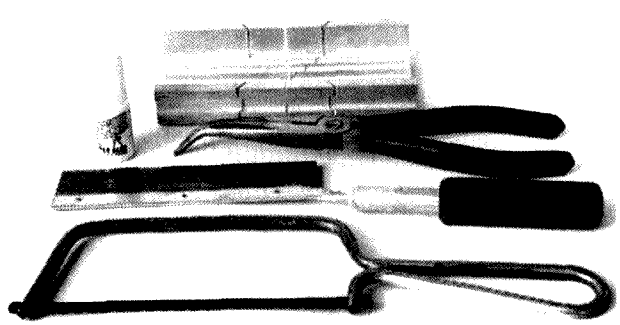


Photo 5 – Complete kit.

Herbert (Herb) Newman Stevens VK3JO

It is with great sadness we record the passing of Herb Stevens VK3JO who passed away on Sunday, 9th January 2005. He was an Honorary Life Member of the Wireless Institute of Australia and an elder statesman of our hobby.

His first amateur licence was dated 29.9.33 when Herb was aged 23 years. He was regularly active on the amateur bands, in particular 160 m and 2 m.

Herb's interest in radio goes back to 1923 when, at the age of 13, he built his first crystal set receiver from an article in Pals magazine. This was on the dawn of radio broadcasting in Australia.

The mysteries of wireless for the teenager included tuning into the Morse code transmissions from Melbourne Radio and ships at sea. In constructing his equipment Herb was assisted by his brother Bob VK3OJ, who predeceased him.

Herb saved up and purchased his first radio valve and built a receiver to expand his interest. He was able to listen to radio amateur pioneers such as Max Howden VK3BQ and Howard Kingsley-Love VK3BM (both now deceased) as they and others were pushing the new frontier in global communications on the short-wave frequency bands.

The WIA Victoria office-bearer list of 1938 recorded Herb as a councillor and member of the Magazine Committee with the responsibility for distribution. He was also involved in the Short Wave and Technical Development sections of the Institute.

In an ambitious activity, Herb VK3JO and others operated a 24 hour continuous test on the five metre band on 22-23 May 1938 from the WIA Victoria rooms in Queens Street, Melbourne. Herb operated his own home-built transmitter. H-Array antennas were aimed at Europe and the United States, however there were no DX contacts. His activity on that band also included field day operation in the You Yang Ranges.

Just prior to World War II he upgraded his amateur station equipment significantly, but it had to be delivered to the post office because possession of amateur transmitting equipment was prohibited during the war years.

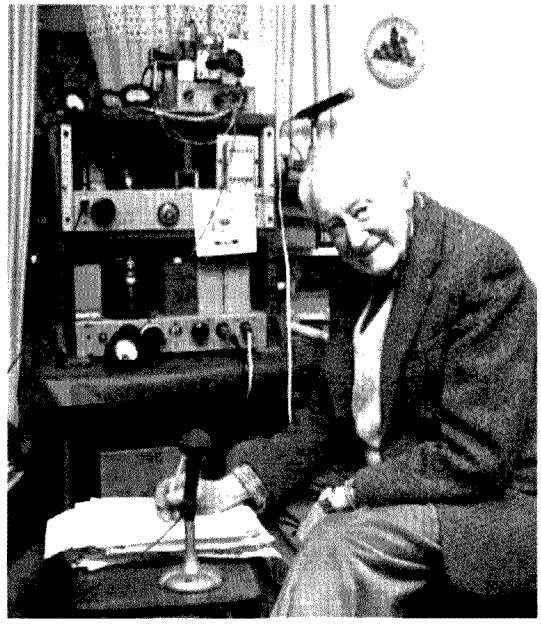
His involvement with the Wireless Institute of Australia, Victoria Division, was notable in that he was the President 1941-45 and kept the WIA journal Amateur Radio magazine going during the war years.

Herb's trade of plumbing was considered an essential service so he was not required to take up military service.

Post-war saw his continued involvement on the WIA Victoria Council, and he was Chairman of the VHF Group.

Herb was awarded Honorary Life Membership in recognition of his contributions to the hobby. He was also a life member of the Radio Amateur Old Timers Club where he was a regular and active participant.

Herb Stevens VK3JO was a quietly spoken gentleman, always willing to share his knowledge, and held many long friendships in the amateur radio fraternity among old timers and newcomers alike. He provided a valuable link with the pre-war era.



He will be sadly missed.

Vale Herb Stevens VK3JO

Based on an item from the Amateur Radio Victoria web page

ar

"Paddyboard" circuit construction ~ revised *continued*

VE5FP (Reference 1). The technique was introduced here in an essay by Harold Hepburn, VK3AFQ (SK) where he outlined a similar amplifier (Reference 2). Basil Dale, VK2AW was also instrumental in sharing this bright idea with the QRP fraternity. Roy Hartkopf, VK3AOH (SK) coined the apt nickname; "Paddyboard" (our American colleagues call it "Manhattan"- presumably because it resembles a city street grid layout).

References and related articles:

1. "Four-watt Wideband Linear Amplifier"; J Koehler, VE5FP, Ham Radio (USA), Jan '76, pp42 - 44.
2. "Solid-State Power"; H Hepburn, VK3AFQ, ARA No's 12 and 13.
3. "Build It Yourself From QST"; Hale, QST April - July '92 (excellent series).
4. "How to Lay Out RF Circuits" I. White, G3SEK, RadCom Feb/Mar. '91.
5. "Manhattan-Style Building Techniques"; C Adams, K7QO, Homebrewer #1 (journal of the American QRP Club- www.amqrp.org), Summer, 2003, pp 20 ~ 23.
6. ""Paddyboard" Circuit Construction"; Diamond, Amateur Radio, Feb. '95.
7. "Try Building Your Own Equipment"; G Diana, N2JGU, QST, Mar. '95.
8. "Surface Mount Technology- You Can Work with It!"; S Ulbing, N4UAU, QST, Apr/May '99.
9. "An Easier Way to Build PC Board Enclosures"; Kopski, K3NHI, QST, Sep. 2003.

ar

ARISS:

A way to get the next generation interested in amateur radio

Become involved and spread the word

J.A.(Tony) Hutchison VK5ZAI
Aust. ARISS Coordinator & telebridge station.
e-mail vk5zai@amsat.org

ARISS, short for *Amateur Radio on International Space Station* is about giving students and young people a chance to speak live with the astronauts on board the International Space Station as they circle 370 kilometres above the earth at a speed of 27,000 kph. ARISS also provides a radio link for the crew on board the ISS to enable them to communicate with their family and friends from virtually any point on earth they may be passing over at that time. We also provide a secondary communications backup system for NASA should it be required.

It's a program run by a small group of dedicated Amateurs from around the world and is sponsored by NASA, the ARRL, AMSAT, and Worldcomm MCI.

Any school worldwide can apply and have their students speak to the ISS providing certain criteria are met. Students are expected to be taught the basics of space travel and the type of research that is being conducted on the ISS by NASA and the International crew on board. This enables the students to ask intelligent questions when their turn comes around.

At present ARISS is setting up around one school contact per week except for weeks when the ISS is having a crew change or doing EVAs. Unfortunately due to the popularity of the program we currently have a waiting time of around two years, however any schools interested are encouraged to apply ASAP. Time soon passes by, and unfortunately the waiting queue isn't getting any shorter.

The actual link-up between the school and the ISS can be done one of two ways, by direct link or by a telebridge link.

(1) A direct link-up usually involves setting up an Amateur Radio Station at the school, complete with tracking antennas and a backup station. This is excellent and gives students an insight into what a complete Amateur Station is all about, but can involve a lot of work. It also means you have to wait for a suitable time for the ISS to pass directly over the school, as well the timing has to suit the classes involved, the Astronauts and NASA. This can add several months onto the waiting time, in fact probably more for Australia & NZ. This is because the crew works to UTC time which means that they start their day at around 5:00pm Aust time, and it's considered that 9:00pm is the latest that young students should be kept up at night. This gives a window of only 4 hours per day to work with.

(2) The second method used is via a telebridge link; this involves setting up a special interface unit with microphone, speaker and audio outlets so a large audience can hear both sides of the conversation at the school. The interface unit will be lent to the school for the occasion. This interface plugs into a standard phone line that's then patched through to the telebridge station selected to do the Earth to ISS radio link. In most cases this set-up is superior to a direct link-up as the ARISS telebridge stations have to meet a high standard and are experienced insetting audio levels and tracking satellites. This method allows for greater flexibility regarding the position of the ISS at the time of the link-up, as any of our eight worldwide telebridge stations is capable of handling the contact.

In both cases Amateurs are encouraged to set-up a satellite tracking display at the school (preferably with a data projector, the school may have one) so students and guests alike can see the ISS approaching the linking Amateur station. Power-point displays are also available for the event if required.

As can be seen a lot of work goes into setting up these school contacts around the world, and the astronauts on the ISS have a busy schedule so we must make the ten minute contact window a success.

The ARISS team meets via teleconference once a week and planning for each school is started three to six months in advance.

The things we must take into consideration are the times that suit the school. Remember this involves schools all around the world with different time zones and holidays etc. The timing has to suit the astronauts and NASA and the location of the ISS at the time of the link-up. This can be difficult as the altitude of the station is boosted periodically and this changes the orbit times. Adding to this we must allow for crew changes and EVAs so it can be seen a lot of hard work has to be done behind the scenes before the school gets the go ahead.

You are encouraged to contact your local school to see if they would be interested in applying. This is a great opportunity to expose our hobby, Amateur Radio, to the younger generation, You can become involved by helping set-up at the school when the time comes. I often point out to students, you CAN'T speak to an astronaut on your computer but you can via amateur radio!

My web site at http://www.electric-web.org has links to NASA educational sites for students of all ages, as well as the application form, example questions for students, and help for teachers. This can be downloaded in word format. Once a school has applied and been approved an ARISS mentor will be appointed to offer help to the teacher if required.

Space station talks to St Martin's in Mt Gambier

Tony Hutchison VK5ZAI

The ARISS contact between the ISS and St Martin's Lutheran College in Mt Gambier on Thursday 17th March was a great success. Ten students ranging from reception to year nine asked Astronaut Leroy Chiao all the twenty questions with around twenty seconds to spare before the ISS slipped below the horizon.

The students were prepared by their teacher Jeanie Axton who did a brilliant job organizing their questions on separate cards for them, and maintaining continuity of the queue during the linkup so no time was lost. The telebridge link was handled by Nancy WH6PN in Hawaii who did an excellent job handling the downlink and switching. The linkup was also carried live on the Internet and was relayed via IRLP and EchoLink.

A gathering of around two hundred parents and guests along with students and members of the South East Radio Group crowded into the schools music room to listen to the event. Tony VK5ZAI setup a power point display of space scenes along with Instant Track to show the progress of the ISS to the audience while they waited for contact to start. After the ISS had passed Tony answered numerous questions put to him by the audience. John, WD5EEV supervised setting up the line connections, and the participants were introduced by Will, KC6ROL who as usual did a great job.

The evening was covered by WIN TV, Bush Vision, a new community TV station, the ABC radio network, The Border Watch newspaper, and the WIA. Numerous photos where taken by members of the South East Radio Club and some of these will be available in a few days at http://www.arrl.org .

This was the seventh Australian school to have taken part in the ARISS project.

ar

Photos by Tom VK5EE

ARISS: A way to get the next generation interested in amateur radio *continued*

Any further inquiries can be directed to me by emailing vk5zai@amsat.org or hutch@electric-web.org or phone (08) 8767 2878

Other sites of interest are :

The latest ARISS announcement and successful school list is now available on the ARISS web site. There are several ARISS web sites:

English: http://www.rac.ca/ariss/

French: http://c.avmdti.free.fr/ariss/index.htm

ARISS Europe: http://www.ariss-eu.org/

ARISS Japan: http://www.jarl.or.jp/ariss/

Other locations include:

Latest ARISS announcements and news

http://www.amsat.org/amsat/ariss/news/arissnews.txt

Successful school list

http://www.amsat.org/amsat/ariss/news/Successful_ARISS_schools.rtf

ar

TTS Systems Communications Equipment

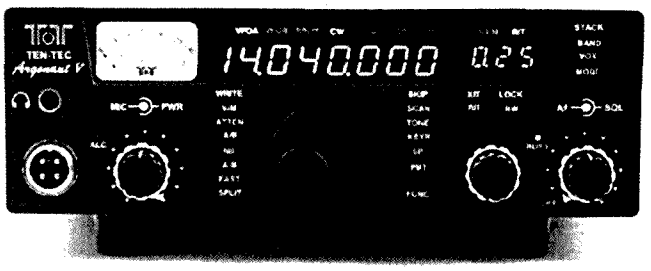
TTS Systems www.ttssystems.com.au **FREE CATALOGUE**

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

Model 516 Argonaut V IF-DSP QRP Transceiver

An IF-DSP software-defined radio for QRP!



Argonaut V has the benefits and features of IF-DSP, in a modern 20 watt HF transceiver. Our philosophy is that "low power" need not be synonymous with "incomplete". Some low power rigs offer pieces as options. DSP as an option? Not with Ten-Tec. Some offer limited performance and features. With the new Argonaut V, we offer solid HF radio performance in a user-friendly format, competitively priced.

20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjustable from 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP). Metering measures forward or reflected power in switchable 2 or 20 watt scales.

A true general coverage all-mode HF transceiver. Receive .5 to 30 MHz continuous in user-selectable tuning rates of 10 Hz or 1 kHz. Transmit on all 9 HF ham bands 10-160 meters.

35 IF-DSP receive filters are built-in. No extra filtering to buy to operate any available mode! Filters are 200 Hz to 1000 Hz in 50 Hz steps, 1000 to 2800 Hz in 100 Hz steps; 4 kHz and 6 kHz in AM. An additional 15 kHz filter is provided for FM mode operation. Shape factors all 1.5:1 or better.

This little rig is a PSK31 dream. No accessory boxes necessary. Simply connect audio cables from the audio in and audio out jacks to your PC sound card and you're on the air. That's right, no interface, no dropping resistors in the TX line - plug it into the sound card and get on the air. While already suitable for digital mode operation, a high stability TCXO and a rear heat sink fan kit are available as options.

Like other recent Ten-Tec HF transceivers, the Argonaut V is a software-defined radio. All functions and features of the rig are stored in Flash ROM. To add new features, simply visit our website, download the latest, and it's as if your rig rolled off the production line a few minutes earlier.

Selectable metering functions. In receive, S-units. In transmit, selectable among 25 watt / 5 watt forward power scales, 25 watt reflected power scale, 1.0:1 to 2.5:1 SWR or collector current draw.

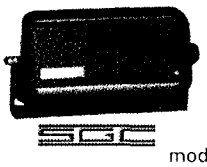
Band scan and memory scan. Memory scan has lockout feature for skipping constantly busy frequencies. Band scan can be set to scan between two user-defined frequencies of any margin. The operator can even program and scan memories for different modes.

CTCSS tone encode for 10 meter FM repeater access.

Heavy-duty cast zinc main tuning knob.

Variable CW transmit offset with tracking sidetone, adjustable 400-1000 Hz. Like all Ten-Tec rigs, Argonaut V is equipped with full QSK operation in CW mode. Built-in CW keyer with variable speed control, 10-50 WPM.

Argonaut V is equipped with a PTT hand microphone as standard equipment.



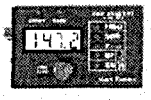
ADSP SPEAKER

Works with the press of a button. Three modes: no noise reduction, the original ADSP, and the new ADSP2 noise reduction mode which provides up to 26 dB of noise reduction within the passband. ADSP2 Speaker is "One Touch" - simple to operate.

We have

SGC

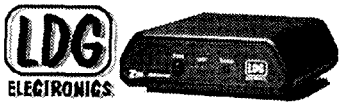
SGC 237 Waterproof Auto Tuners
SGC 239 Economy Auto Tuners



Autek Antenna Analysers
Autek RF 2kW In-line Power meters

Lutron
Lutron Measuring Instruments

Vantage Pro Weather Stations

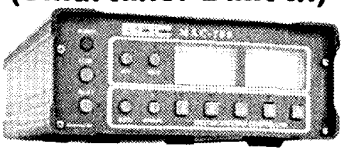


Z100 TUNER AND
Z1000 HIGH POWER AUTO TUNER

MAC-200

MASTER ANTENNA CONTROLLER

(Smartuner Built-In)



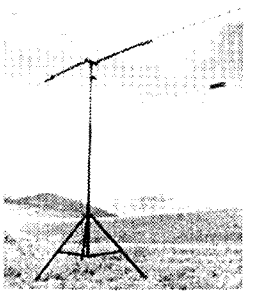
Controls
5 ANTENNAS
3 S0239 COAXIAL CONNECTORS
1 BALANCED ANTENNA OUTPUT
1 END FED LONG WIRE

"The box that brought my amateur radio hobby back to life"

TEN-TEC KITS

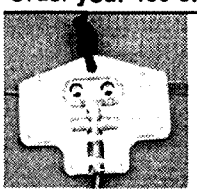
Buddipole

A Complete Portable Antenna System



- (9 bands, 2 - 40 meters)
- Tripod - ext legs•
- 8' portable Mast
- Rotating Arm Kit change configs
- Antenna Bag padded w/shoulder strap
- Extra S/Steel Tele Whip
- FREE – New 10-page modeling report

Order your 450 ohm Ladder Line NOW



Ten-Tec 3003 Acro-Bat antenna hanger.

Made from UV resistant polycarbonate plastic, Hammers won't break it. Hardware is S/S Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna. or ladder line with internal pegs.

41st Annual Amateur Radio Convention

&

Australian Fox Hunting Championships

South East Radio Group Convention 2005

June 11-12

(Queen's Birthday long weekend)

This year's convention will be held at the Mount Gambier Scout Hall in Margaret Street, on the southern side of the railway line near the centre of town. GPS coordinates are Lat: 37 49 57 Long: 140 46 37

Fox hunting, stalls, home brew competition, great company.

CONTACT FREQUENCIES : 2m Repeater 146.900 and 70cm Repeater 438.325

For info or table bookings contact Wayne VK5ZX on

(08) 8725 4335 or 0407 718 908 or email at vk5zx@internode.on.net

WIA news *continued*

Hobart BPL Trial

WIA director, Phil Wait, VK2DKN, the BPL Working Group Coordinator, has announced the WIA's 6-point plan for the upcoming Aurora Energy BPL trial in Hobart.

1. Determine the location of the trial;
2. If possible, measure the background noise level in that area prior to the trial;
3. Measure the noise / interference level during the trial;
4. Publish our results in the context of substantial interference to the amateur service and other HF users;
5. If local amateurs are affected by BPL interference, encourage and support their interference complaints to the ACA, and
6. On a wider scale, develop criteria for what constitutes substantial interference to the amateur community.

He said that the Group has been developing and validating methods and tools to assist in assessment and measurement of ambient noise and interference. Those tools are now ready for use. Being able to soundly argue that interference is substantial is essential to pursuing action under the interference provisions of the Radiocommunications Act.

Alf Chandler, VK3LC, 100

The Moorabbin & District Radio Club, is set to celebrate the 100th birthday of Alf Chandler, VK3LC with a special function on the morning of 31 May 2005. Alf has held an amateur licence for 81 years.

RSGB concerned for the future of the amateur service in the UK

A delegation from the RSGB led by its President, Jeff Smith, MI0AEX, is to meet representatives of the UK regulator, Ofcom, to discuss the future direction of amateur radio licensing.

The RSGB says that it is strongly opposed to any steps that may be taken to bring deregulation and will fight hard to maintain the status of radio amateurs and the privileges they currently enjoy.

ar

News from...

VK2

Compiled by Tim Mills.

The AGM of the NSW Division was scheduled to be held on April 16th. There will be a report in the June notes. An election was required as eleven nominees contested the nine positions. There were ten Special Resolutions and three Motions presented to the meeting. NTAC Co-ordinator Brian VK2WBK circulated all members with a questionnaire to update the State's repeater data base for the next Callbook. If your area is still to reply, please do so asap. Information is sought from individuals as well as clubs and repeaters group.

E-mail contact with "Amateur Radio - New South Wales", the trading name of the NSW Division, has recently been confined to vk2wi@ozemail.com.au as the previous address suffered problems. The postal address is Box 9432, Harris Park 2150. Fax 02 9633 1525. Telephone 02 9689 2417. The Bookshop is to be found at "Amateur Radio NSW Technical Bookshop".

The Trash and Treasure and Homebrew meeting for this month is scheduled for Sunday the 29th.

Terry VK2UX is currently conducting a weekly theory course at Amateur Radio House, Parramatta. The course has recently been moved to Wednesday night to allow more to attend. They will soon be having their first exam - a Regulations paper. From last year's course - all candidates are now licensed, advised Terry. This year's class will end about mid year. All our educators are waiting for the new licence and syllabus to be released.

Waverley Amateur Radio Society

It is now 86 years since this small but very active Sydney club was founded. Its permanent clubhouse is located on the waterfront at Rose Bay and serves amateur radio and electronics enthusiasts living in the inner city area and southern and eastern suburbs.

Major improvements are currently taking place to its premises, the clubroom and operating facilities.

Meetings are held on the 3rd Wednesday evening of each month. The clubhouse is also open in the afternoon of the 1st Saturday of every month, when work may be carried out to improve the club's amenities and to fix members radio gear. As well, some just go along for a ragchew or to operate the club station.

This year the club's major event, the annual auction, will be held on the morning of Saturday, June 18th. Detailed information is available on the club's web site.

Anyone interested can find information on all aspects of the club on its regularly updated web site at www.vk2bv.org or call Simon VK2UA on 02 9328 7141.

Around some of the VK2 Clubs

•The Mid South Coast quarterly meeting is a week later this month due to other bookings at the Little Forest Lodge, Milton. Now on Saturday the 14th.

•The 30th Oxley Region Field Day at Port Macquarie will be held on the June long weekend.

•The Far South Coast held their AGM in March. They sponsor two repeaters, VK2RFS on 6750 and VK2RSE on 7375.

•Tamworth Radio Club restored their 6750 VK2RTM after it had a two year holiday. They meet on the first Friday of the month.

•Coffs Harbour and District ARC held a special meeting last month to discuss the future of the repeaters in their area.

•St. George ARS commenced a series of monthly lectures last month on the various data modes.

•Chifley ARC in Western Sydney meet every Saturday afternoon at the Good Shepherd Church, Plumpton.

•Urunga hosted another successful Easter Convention. Over 55 registrations. Fox hunt competition was again provided by the VK3 experts.

•Summerland puts out a weekly newsletter by email and provides extensive relays of VK2 and VK4 news sources.

•Hunter Radio Group conducts a Monday evening news session which includes highlights from the previous Sunday VK2WI news.

•Waverley ARS have a project afternoon on the first Saturday each month.

•Manly Warringah transmit a Radio School lecture every Tuesday evening on their two metre repeater VK2RMB - 6875.

•Gladesville ARC continues to provide a technical TV transmission on Wednesday and Sunday evenings on the 70 cm ATV channel.

•The Great Lakes Club on the lower North Coast is planning to add a 70 cm repeater to the VK2RGL 7100 site.

Thanks to all who contribute to the VK2WI news sessions. The dedicated group of VK2BWI operators continue to provide 'human operated' morse on 80 metres - 3550 kHz - many evenings per week at 8 pm.

Some of the text from the Sunday sessions is on the website. Over summer Jack VK2XQ provided a six metre activity report. Bill VK2ZZF provides a monthly astronomical report. Some wonder what radio content is in stars. Bill often includes details of interrelated activity and of nets on the subject. Many amateurs have a hobby interest in the stars as well as radio. Thanks to Jack and Bill for contributing to the news session. We invite all clubs and listeners to submit news. Every bit helps, even if it is only dates for the Coming Event column. VK2WI reaches a large audience. As the bottom of the present solar cycle approaches, the lower HF VK2WI channels provide good state and interstate coverage. The evening 40 metre AM transmission is early enough to beat the overseas broadcasters.

VK2WI is seeking more operators, both announcers and engineers. The Sunday format has settled down into two different news sessions. The morning, has a relay of VK1WIA and selected segments. The evening session provides expanded coverage of the segments shortened for the morning, as well as evening-only items. For times and frequencies, see the Directory, page 56.

Oxley Region Amateur Radio Club Inc.

ABN 12 164 305, P.O. Box 712 Port Macquarie N.S.W. 2444

Covering Port Macquarie and the Hastings Valley.

30th Anniversary Field Days Celebration 2005

On the Queen's Birthday Long Weekend, 11th and 12th of June, the Oxley Region Amateur Radio Club will celebrate its 30th Anniversary Field Day weekend. All members of the Amateur Radio Fraternity and their families are invited to attend at the usual venue, the Sea Scout Hall in Buller Street, Port Macquarie on the Western Side of Kooloonbung Creek next door to the "Country Comfort" Motor Inn.

While en route participate in the Foundation Members Mobile Contest. The rules will be published on the Club Web-site.

Registration will commence at 0900 Saturday and 0830 Sunday. Tea, Coffee, biscuits and slices of Birthday cake will be available free as soon as the Billy boils, with cans of various soft drinks also available at reasonable prices on both days.

The Fox Hunts will commence at 1000, Saturday, with the 2m 1Tx, and a 2 m Pedestrian at 1130, followed by the 10m 1Tx (Non Amateur Passenger) at 1345 and the 2 m Talk In Fox Hunts at 1530. Sunday Fox Hunts will be the 80m 1Tx at 0900 the 2 m 2Tx at 1030, 10 m 1Tx at 1245 and another 2 m Pedestrian Fox Hunt at 1400. Each day 1st, 2nd and 3rd Prizes will be awarded after completion and results confirmation of each Fox Hunt Event and Participation Prizes will be given to all entrants in each Hunt by the Event Marshall.

The Oxtales Trophy for the Fox Hunt Point Score will be awarded on Sunday afternoon.

At 1800 Saturday we hope all will gather at Westport Bowling Club where meals may be purchased at the Club Bistro. At 1930, Guest Speaker Michael Owen, VK3KI, President of the WIA, will address all who attend in the Westport Bowling Club Function Room. To assist in catering for the Meal/Guest Speaker evening please advise intending attendance by contacting the Club as indicated below.

There will of course be displays by leading suppliers of Amateur Radio Equipment and tables of used Amateur Radio Equipment and other items for sale and the WIA Bookshop in attendance.

Our biggest field day ever, over $5000 in value

The first 50 Visitor Registrations each day will receive a special 30th Anniversary Sample/Show Bag.

The Saturday lucky Registration Prize is 3 nights for 2 people in a Luxury apartment at the Oxley Cove Holiday Apartments in Port Macquarie. Ph. 1800 809 193

Saturday is Australiana day with Guest Speaker, Michael Owen, VK3KI, President of the W.I.A.

Saturday Raffle is an Aussie Goods Hamper with 10 Prizes, total value $500.

Saturday lunch at 12.00 will be Sandwiches & fruit or vouchers for Hamburgers, Fish and Chips, Pizza and Rolls will be available.

The Sunday lucky Registration Prize is 2 nights in a luxury ocean view cabin (2 B/R, 5 people) at Sundowner Breakwall Tourist Park, Port Macquarie, Ph. 1800 636 452

First Prize in the Sunday Raffle of Electrical, Computer, Telephone and useful items, is valued at $500 with 9 additional prizes totaling $1000.

Sunday Lunch will be a Barbecue with dessert of Fruit Salad and Ice-Cream.

We will have Ladies Raffles, Hourly Lucky Spot Prizes, Best Home Brew equipment competition along with lots of crosswords and other fun competitions to test and stimulate and a Memorabilia Display Board. There will be a Prize and the Bob Todd Motors Trophy for the Best Amateur Radio Vehicle and 3 prizes for the Foundation Club Members Field Day Mobile Contest as well as a Best E-mail competition and the Oxtales Cup Fox Hunt Point Score Trophy.

E-mail us on vk2bor@tsn.cc and tell us if you are coming. Let us know how many years you have supported our Field Day and share your memories. You will be in the draw for some great prizes from our E-mail Display Board. Coming or not you will still be in the draw.

Lunch for both days is included in the Registration Fee.

Registration Fees

Both days: $15 for men, $10 for ladies and $10 for school age children.

Saturday or Sunday only: $10 for men, $7 for ladies and $5 for school age children.

Contact details for any queries and catering

Club e-mail vk2bor@tsn.cc

Bill Brooke VK2ZCW Ph. 02 65810547, e-mail cabrooke@tsn.cc

Bill Sinclair VK2ZCV Ph. 02-65839302, e-mail bilsinvk@ecopost.com.au

Come one and all! We are looking forward to your company. Reminisce with us and help us celebrate our 30th Anniversary Field Days. Enjoy beautiful Port Macquarie, bring your family and friends, there are two shopping centres, Movie Theatre, Museum, Surf Beaches, heated pool and other attractions within walking distance of our venue.

Plan ahead

ALARAMEET

9th to 12th September 2005

http://users.ncable.com.au/gsyme/AlaraMeet/

2005 Wadda Cup Contest

24 September, 2005

News from...

Summerland ARC

John Moyle Field Day

VK2SRC finds a new site at Acacia Plateau

Chris Meagher VK2LCD

Last year the Summerland Amateur Radio Club went to a new site for the John Moyle Contest, and we were successful in making more contacts and improved our score. It was decided to go to the same spot this year. The location is only a hundred metres or so south of the VK2/VK4 border, 1030 metres up at the north-eastern edge of the Acacia Plateau, 12km east of Killarney.

On our previous visit, we could see across to some of the spectacular rocky peaks around Mt.Barney and to Mt.Superbus, the highest peak in northeast VK2. This time, we found the site hemmed in by thick pines and hakeas, which had tripled in height. Fortunately we had the benefit of tall portable towers to get the antennas in the clear. The VHF/UHF antennas used were a phased pair of 9 element quads on 2m, a 6 element yagi on 6m and a 15 element yagi on 70cm.

The HF antenna was changed during the course of the contest, starting out with an inverted-V dipole cut for 40m, on an 8m ex-military portable mast. This worked extremely well, 208 contacts on forty attesting to this. When changed to an 80m dipole for the evening, performance was poor, for reasons as yet unknown. As I write this the logs are still being prepared, but the score looks like showing a slight improvement over last year.

The job of driving for 3 hours plus, setting up, operating flat strap, pulling down and driving home, was again a big task. This year it was made a lot easier by the presence of 4 extra personnel. It was wonderful to have a break and be served with food off the barbie. The club has now done 4 successive John Moyle portable operations; each time our field skills improve and each time something is learnt. We know nevertheless, that Murphy and Sod are ever so patiently waiting nearby in their tireless quest to see things go awry.

The SARC team was Karl VK2XL, Rodney VK2HRW, Kris VK2MRN, Chris VK2LCD, Rob VK2KGK, John VK2JWA, Scott SARC112 and Mark, SARC113 (the latter two being associate club members, who are non-licensed persons interested in radio communications). Thanks to those faithful club members who called us, and cheers to those more distant stations. The furthest contacts were to Alaska and Canada on forty, which scored no points but provided a thrill. See you in 2006, from where we do not yet know.

(See also inside back cover)

Photos: views of the site

VK3

Geelong Radio and Electronics Society (GRES)

The first 3 months of this year have been highly productive. Members have been building portable/mobile HF (screwdriver)antennas. This has been the most ambitious project ever tackled by the members. All participants in the project should complete their antennas within the next few weeks. When all are completed we will have 16 working all band HF antennas. Ground work has already begun on the next project. This is to be a GPS unit to be used for APRS work.

We had one visit during March.This was to the "Neighbourhood Cable" offices in Geelong.We were given a talk about the services they offer such as cable TV, telephone and high speed internet connection. This was followed by a tour of the premises. We saw how the satellite TV signals were received and then distributed to the network. This distribution is by fibre optic and coaxial cable. It was also explained to us how amplifiers are used within the cable network.These amplifiers ensure that customers get a good quality signal at all times.

So far this year we have had 3 guest speakers. The first was a representative fron "Dremil" tools. He demonstrated the various hand tools available from his company and also donated equipment to the club.This will be a most valuable addition to our workshop.

A representative from the local "Jaycar"store showed us the latest range of stocked items. These included multimeters, AC/DC current clamp meters, digital TV cards for PCs and many other new products.

A most informative talk was given to us by Bob Tait VK3UI on automotive electronics. He talked at length on the new systems that we can expect to see in new cars in the foreseeable future. Many of these new systems are to improve the safety not only of the driver and passengers but also to avoid collisions between vehicles. One item to be deleted from cars in the future will be the distributor. So take note all who like HF mobile, no distributor so no more ignition noise. However with more computer control in cars we may have problems with computer generated harmonics.

Visitors to Geelong are always welcome to attend our Thursday evening meetings. These are held at 2000 hours local time.The address is 237B High Street Belmont, at the rear of the Belmont Youth Club. Our museum located in the Old Geelong Gaol is also open to the public every Saturday and Sunday.

Rod Green VK3AYQ

VK4

VK4 WICEN

(State Co-ordinator, Ewan McLeod VK4ERM)

WICEN in VK4 holds a net every Sunday on 7075 kHz from 2230 UTC. The net calls in regular stations and then invites new stations. Mix it with other WICEN ops and call in on the net!! With the cyclone season drawing to a close the Bundaberg WICEN Group is standing down from a pretty busy training season. At the start of summer the group had two one day training sessions followed by practice nights on the local repeater, while some five members attended an afternoon SES table top exercise in March. Bundaberg WICEN also provided lectures in Message Writing Practices for both SES Welfare and Red Cross. Realising that no local WICEN Group can sustain a prolonged activation in a worst case scenario without help from outside operators, Bundaberg and Hervey Bay WICEN are planning a full day combined training session on 22nd of May.

Murrumba Communications Group

Repeater VK4RSS is back on air after a very long time on the workbench and the group thanks the techs at Villcom Caboolture. VK4RSS is primary Slowscan TV (remember no novice calls please!) and voice is secondary. 70 cms on 438.575 no tone, open access 24/7. This repeater is supplied for the use of ALL Licensed Amateurs by the MURRUMBA COMMUNICATIONS GROUP. 'Computers are like air conditioners, they don't work properly after you open your windows'.

73s de Ian VK4HX

Brisbane VHF Group

It's on again - the Brisbane VHF Group's "Antenna Day", Sunday 10 July in the grounds of the Mayfield State School in Carina, Brisbane, and all interested amateurs are invited. More information will be made available as July approaches, but mark your calendars now and plan to be there. Light refreshments are expected to again be available on the day.

From the QAC

Bob Tomkins VK4DOG has agreed to join the QAC as a representative of the Gold Coast Region. Bob lives in Beaudesert Shire high atop Mt Tambourine, Hey. Must be one of the neighbours of our very own Contest Editor Chris VK4AA/3CE! Bob is being brought up to speed in QAC matters, details of the past meetings, WIA constitution etc, by Secretary Ken VK4KF. Welcome aboard VK4DOG Bob Tomkins. So I hear you ask, why another pair of helping hands to our QAC? Well in short, the Constitution of the WIA sets out initial members of the Queensland Advisory Committee were those who were the members of the WIA Queensland Division Council at the creation of the national WIA. From time to time new appointments will be made to the QAC to meet

requirements. QAC elections will be called for a new committee to take effect probably in May 2007 as indicated in the WIA constitution. To meet current requirements two new appointments have been made to the QAC to strengthen our regional representation: Harvey Wickes VK4AHW Sunshine Coast Region Representative Bob Tomkins VK4DOG Gold Coast Region Representative. Both will bring a wealth of knowledge and skills in support of WIA activities in Queensland.

Redcliffe work on

The Redcliffe and Districts radio club has been doing a large amount of work upgrading the clubs 2 metre & 70 cm repeaters. The 2 repeaters are situated at Wamuran, which is approx 15 km west of Caboolture on the north side of Brisbane. The 70 cm frequency is 438.325. The 2-metre link, which is on 146.925, has for the last 4 months also benefited from the inclusion of Echo link. If you like to call in to the north side of Brisbane look up VK4KCK on Echolink. Redcliffe has also started a rebroadcast of Q5 education hour. After an overwhelming vote of support the club set about building the necessary hardware for this initiative. The broadcast occurs Tuesday 8pm and everyone is invited. They hold check-ins at the halfway point and at the end. Check-ins on the club e-mail which is RDRC4@hotmail.com (Secretary of the Redcliffe & districts Radio Club)

Digital matters to the QDG

The sound card interface project kit offered by the Queensland Digital Group can be seen on the web, for those reading the text edition it is at www.powerup.com.au/~richarda/SCI-010.htm. For those listening, you should know the drill by now... go to wia.org.au click on the news broadcast link and read this week's news for Richards URL. You can use a second sound card installed in your computer and free or share software to access a host of modes of operating data via radio. This covers packet, Slow Scan Television, PSK31, RTTY and even Morse code. This unit interfacing the computer to the radio was developed to provide most flexibility for the job. From Richard Atkinson, Secretary of Queensland Digital Group".

Radio Scouting

The 2005 JOTA and things are looking better for JOTA in the great SouthEast this year even with Baden Powell Park being activated. The Queensland Digital Group under the guidance of Richard VK4ZA is coordinator this year. QDG do need a hand or two to test some radio equipment and repair antenna leading up to activities this October, for details please contact VK4ZA on 3376 5231.

http://www.scouts.com.au/international/jotafront.html

VK4 Enquires to: - Dr Paul Rollason, International Commissioner, QLD

E-mail bc.international@qldhq.scouts.com.au

ar

VK5

John Moyle Field Day in VK5

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

As is traditional, AHARS had a members' Buy and Sell meeting in March. Many bargains were exchanged. Some of the items on sale prompted the exchange of ideas or a discussion of projects old and new. The meeting was enjoyed by all.

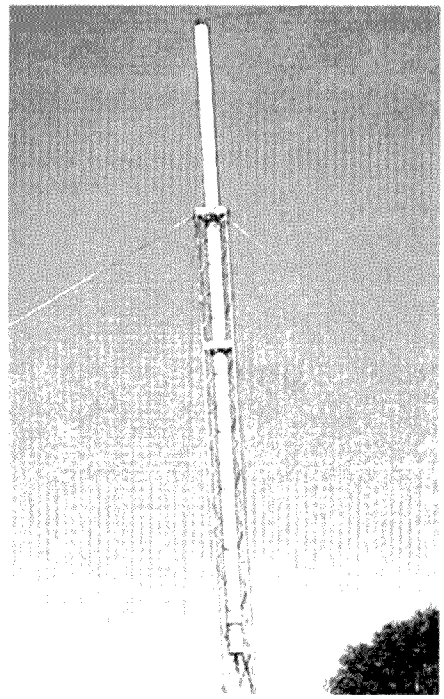
On the Friday following that meeting some of the members headed off for their John Moyle Memorial Field Day locations. AHARS members were involved in at least three sites, this year, because of their involvement with other groups beside AHARS. This is great as it gives us all much more opportunity to take part and to practise our away-from-home skills and equipment.

The main group operated from a bush block near Swan Reach as they have done for several years, now. They used the club callsign VK5BAR. Some were operating with a Scout group using VK5BP at Ashton Oval. Members of both AHARS and NERCS were on Palmer Hill and members of both AHARS and EARC were portable nearer to their home QTH. A busy group, especially when we include the members who used their home stations as well.

The aerials used at Swan Reach were all wire aerials, the same as we have used for several years. "If it ain't broke, don't fix it." If it has worked before why change just for the sake of change? We erect them all either on Friday evening or on Saturday morning and they are all taken down and stored for next year before the final barbeque lunch.

This year there were eleven operators and we had contacts on five out of the six bands we tried. 10-metres was silent this year although we have had contacts in other years.

As always the variability of propagation was a topic of conversation. Usually the



The vee-beam

40 metre station continues into the wee small hours of Sunday morning but this time it was 'dead' by about midnight. Some operators were surprised at the amount of sleep they got this year compared to in other years!!

So far out in the country, away from all powerline and other city interference, 80-metres was a dream band. If only it was usable in the daylight hours as well! Ah well, we can wish, can't we?

In general all the operators felt that the bands were quieter but when we added up the number of contacts we found that what we had lost on some bands we had gained on others. The results will tell if everyone had the same experience.

One does wonder if the Boxing Day tsunami and the importance amateurs played yet again in providing communications during a national emergency, had something to do with the increased interest in field operations.

Thanks John Moyle for making amateurs in Australia realise how necessary it is that we keep our capacity to operate when the normal main power supplies fail. National communication bodies cannot usually operate on a car battery or portable generator.

The photograph shows the 40 metre inverted vee-beam in place (two of the white guy ropes are clearly visible. The vee-beam can just be seen as a fine line from the top of the length of plastic water pipe toward the top right hand corner of the picture). A balun sits in the water pipe with the coax running down the middle. A wire dipole for 20-metres, a G5RV for 80-metres and an unterminated Zepp for 15, 10 and 160-metres completed the array used.

ar

Elizabeth ARC

Colwyn Low VK5UE

Four members of the EARC decided to operate independently in the John Moyle Field Day, but to operate from two sites Wirra Picnic Ground and Hope Hill. These sites are about 8 km apart. Hope Hill is a good VHF/UHF site and Wirra Picnic Ground has plenty of flat area for HF wire aerials.

HOPE HILL

34 deg 45.42' S 138 deg 48.76' - PF95jf

WIRRA PICNIC

34 deg 41.71' S 138 deg 50.09' - PF95kh

Wirra Picnic Ground is within the Para Wirra Recreation Park therefore Parks and Wildlife had to give permission. The site provided a picnic shelter and toilets. Hope Hill is within the Mt Crawford Forest, so the Forestry had to give permission to operate there. As it was Fire Ban season this had to be a 'cold camp'.

The group was Merv VK5MX, Steve VK5AIM who operated the club call VK5LZ, Stuart VK5ADE and Colwyn VK5UE. Merv used his multiband dipole for HF and whips for VHF/UHF. Steve used VK5UE's recently restored TH3, a multi band dipole and hand-helds, Stuart used whips for VHF/UHF and a small mast with 2 m and 70 cm at Hope Hill together with whips on his ute. Colwyn used his dual band vertical for 2m and 70 cm and a 13 element yagi on 23 cm. Power came from car batteries and two GMC generators which ran without a hitch for about 6 hours each. Murphy attended and with all that power we did not have any lights!

HF aerials and the shelter shed at Wirra Picnic Ground

(See also inside back cover)

VK6

Will McGhie VK6UU

Almost gone

The VK6 WIA Council met on April the 5th 2005. Council still has to finalise the bank account and then close it. The Advisory Committee will still need some funds, for example a request has been made for VK6 to send a person East for a meeting on the Foundation License.

A question asked at the last Council meeting was what would be the exact role of the VK6 Advisory Committee? There has been considerable contact between the National WIA and VK6 in regards to a wide variety of winding up issues and some small issues in regards to insurance are still ongoing.

So ends the VK6 WIA 1919 – 2005

Country amateurs

The last VK6 WIA Council meeting discussed country amateur radio clubs? Many of them appear to have either dissolved or are in the process of doing so. There has been a steady decline over many years. The suggested answer that in the 1980s mining was a rapidly growing employer and many amateurs moved to the mining areas and formed radio clubs. The mining companies are now flying their workers in and out. Many workers don't live in the country areas but work on site for a number of weeks and then fly home for a week or two off. It could be that simple.

News from...

VK7

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au
Regional Web Site: www.reast.asn.au

Two metre contact firsts achieved

Rex, VK7MO our resident digital mode expert has reported that March 13-25, 2005 was a record setting fortnight that saw digital mode records set on 2 metre between VK0, VK3, VK7 and ZL.

In VK7 & ZL the first 2 metre contacts between VK7 (VK7MO & VK7JG), ZL (ZL3TY) and VK0 (Macquarie Island, VK0MT) were made using FSK441a mode. Dave, VK0MT, was using 100 watts to a 2.3 wavelength (10 element) beam. This gave Joe, VK7JG the first terrestrial worked all VK call areas on two meters – congratulations Joe.

Following these record breaking contacts, Peter VK3KAI, Dave, VK3HZ and Charlie, VK3FMD (2123km) attempted and were successful in making FSK441a with Dave, VK0MT. Dave then tried some EME using JT65 and completed the first VK0, 2 metre EME contacts with W5UN and KB8RQ. Congratulation to all involved.

Tassie Devil Award alive and well!

In the past month two people have been awarded the Tasmanian Devil Award. We congratulate Hayden, VK7HAY and Grahame, VK3HGK. Take a look the Regional website for award details.

SSTV Mode and Novice Licensees

Some clarification was sought from the WIA/ACA Liaison Team, WIA Technical Advisory Committee and the ACA in relation to the Amateur Licence Condition Determination on whether Novice/Novice-Limited licensed amateurs can use SSTV modes in their frequency allocation. Unfortunately, SSTV are 2F and 3F modes and therefore are not permitted on Novice bands.

BPL in VK7 – Aurora energy's 2nd trial

By the time you read this, the second Aurora BPL trial will be about to start or may have already started and will cover 500 Hobart homes. The WIA has released their strategy for the VK7 trial and I encourage all VK7 amateurs to familiarise yourself with this document. VK7 amateurs are looking to work with the National WIA BPL team to assist where possible with noise floor measurements. A VK7 BPL Watch web page has now been established on the Regional website. Take a look and become informed!

Central Highlands Amateur Radio Club of Tasmania

CHARCT remind all that there is a Morse Refresher Net Wednesday evenings at 8:00pm hosted by Roy, VK3GB on 3585kHz. Roy has kindly donated his time to getting this NET up and running.

North West Tasmania Amateur Radio Interest Group

NWTARIG regular meetings have commenced with one being held on Saturday 30 April 2005. The venue was the Lions Club facility at the Ulverstone Show Grounds in Flora Street West Ulverstone.

Interested persons wishing to contact the club can email them at nwtarig@spamex.com and the Club's web address is www.vk7ax.tassie.net.au/nwtarig/

Northern Tasmanian Amateur Radio Club

April 13 was a "Ladies Night" dinner meeting at Twigs Reflection Restaurant overlooking the Tamar river. Special guest speaker was Mr Anthony Coupe, from Australian Customs who has just returned from Cairns and his stories both amused and amazed, a great night was had by all.

A kindly reminder - Mt Arthur repeater (VK7RAB) is a solar power repeater and with the coming of winter and hence shorter daylight hours, short overs would be most appreciated.

We welcome Rick Becker who has his new callsign – VK7HBR and Roger Simmonds, harmonic of Tony, VK7TY who received his callsign so listen out for VK7HRT on the air as well.

Radio and Electronics Association of Southern Tasmania Inc.

REAST members - Gavin 7HGO, Gary 7JGD, Stu 7NXX, Peter 7TPE, Roger 7XRN, John 7ZZ and "Tiny" Damien were involved in the Southern Tasmania

Exhibition attendees at the REAST Amateur Radio Stand

Endurance Riders event which was held on and around the Ringrove property south of Orford. Six check points where manned around the 120km course. Great job guys!

There is now a second IRLP node in Hobart courtesy of Clayton, VK7ZCR. Node number is 6720. Frequency is 439.100MHz (simplex). Location is Lenah Valley.

Over the weekend of 2 & 3 April, 2005 REAST displayed and promoted amateur radio and electronics to thousands of people at the biennial Model Makers and Collectors exhibition at the Derwent Entertainment Centre. There were 16 licensed amateurs who took time to come and help as well as provide equipment and time for this event. A number of enquiries were received about training, the names of persons interested in the Foundation Licence recorded and 5 Novice Course CD training packs were sold. Over 100 information leaflets were taken together with numerous back issues of Amateur Radio magazines and other information brochures.

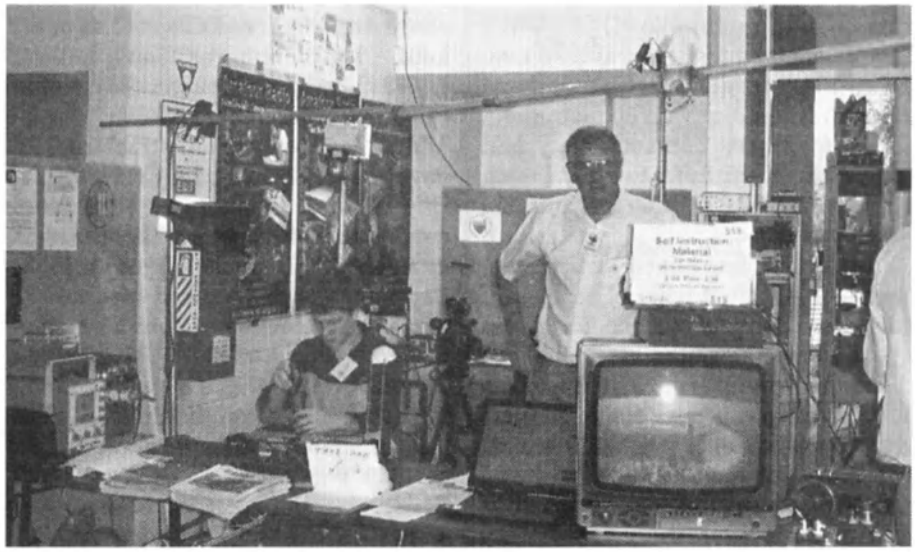
This was a great club event and opportunity to show the general public what amateur radio and electronics is all about. Thanks to all involved especially Ken, 7DY for coordinating.

Photos of the event are available on the Regional website.

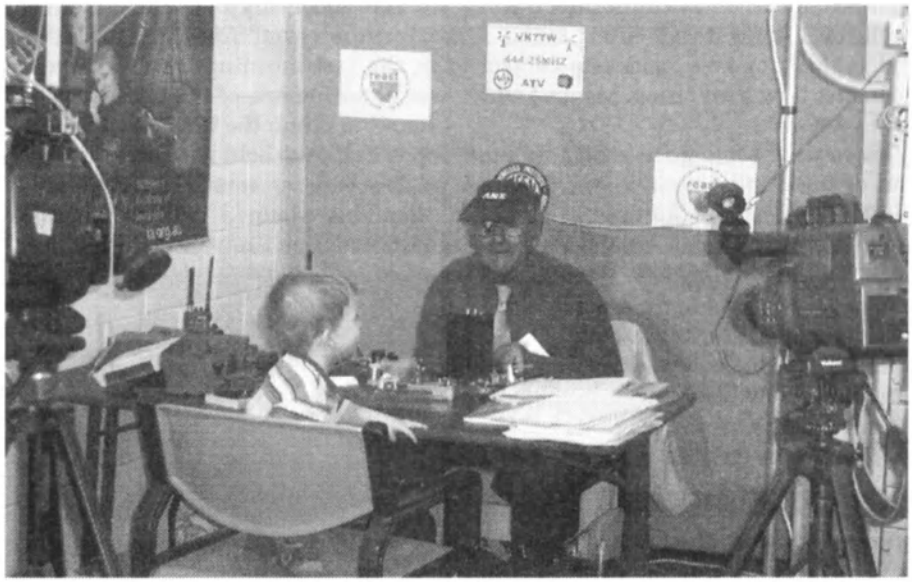
Finally, the REAST Committee, after much deliberation. has decided to move Repeater 2 from Guy Fawkes Hill to the Domain prior to the expiration of the lease in Feb 06.

The Committee acknowledges that this will affect users of the repeater in both positive and negative ways dependent on your location. To give you an indication of what you can expect in relation to signal strength from the Domain we suggest that you take a listen for the 146.850MHz output from VK7RAD. This is an equivalent power level and antenna arrangement as will be installed for the new R2 on the Domain.

ar



Hayden, 7HAY, Reg, 7KK and Jack (back) 7IL on the stand.



Our octogenarian John, 7JK (with "hatcam") and Reuben (aged 3, harmonic of 7TW) at the construction desk.

Clubs ~ plan ahead

When is your major field day in 2006?

Does it clash with another event ?

The 2006 call book plans to list all major events for 2006.

Start your planning now!

Advise: callbook@wia.org.au

ALARA

Christine Taylor VK5CTY

The Thelma Souper Memorial Waro Contest

This Contest, run by WARO, ALARA'S New Zealand equivalent was held over the two evenings of the first weekend in April. It is entirely on 80 metres and allows for repeat contacts every half hour, but it only runs for two hours each night, so it is quite different from the ALARA Contest.

It is the first time I have participated, I regret to say, but it will not be the last. I didn't make many contacts but it was a good Contest nevertheless.

There are a number of WARO members in VK land so it is possible to compete even if you can only hear VK stations. OMs may participate as well as YLs, and both CW and phone may be used.

To make it even more interesting there is a special station, ZL6YL, which operates for only a short time on each night, which becomes a multiplier if you contact it. I know it was calling me but I just couldn't make a legitimate contact no matter how hard I tried. Maybe I will next year.

There were some good scores by the end of the Sunday session and a very good (first time ever in a Contest on her own) score by Lesley VK5HLS as we heard on the Monday Net.

Now all we have to do is send in the logs, no matter how big or small to :-

Bev ZL1OS, 34 Cobham Drive, Kawerau 3075, New Zealand.

A busy weekend or two for some ALARA members

The weekend of March 19/20th was the John Moyle Memorial Field day weekend. For some of the VK5 members who are also members of AHARS this means sharing in the Field Day at the 'bush' QTH of Geoff VK5TY and Christine VK5CTY near Swan Reach, about 2 hours from Adelaide. As usual the YLs did most of the food preparation but they also took their turns on the radios.

For the ones who were unfamiliar with Contest operating it was a whole new world of amateur radio. There were two very new YL operators and two who have done it before, this time. Lesley VK5HLS has had her licence for a while and has joined in the Monday Nets so she had microphone skills but had never kept a log before. For Jenny, not yet licensed but able to operate as a member of AHARS everything was new.

Tina VK5TMC and Christine VK5CTY have been broken in to the Contest/Field Day experience before so were more comfortable either as a log keeper or as an operator. But by the end of the Field Day Contest everyone had tried all the bands available and had done their share of all the tasks, and had FUN doing it.

Some photos of YLs operating in the bush will appear on the front cover of this magazine later, so the one with this column was actually taken over the Easter weekend when again there was a mini-ALARAMEET with five ALARA members and five OMs present.

Over the Easter weekend two towers were erected, ready for a vee beam aimed at Europe (sometime), by the OMs. On the last morning when everyone was admiring one of the towers Lesley offered to climb the tower to undo the ropes that had held the tower upright while it was cemented the day before.

Geoff had planned to do that after the guests had been farewelled, (he has been climbing towers since he was about 17 so is quite comfortable at heights) but he accepted Lesley's offer when he realized she had no fear of heights and wanted to do it. The photo shows what she meant. Thanks Lesley.

Lesley VK5HLS up the tower undoing the ropes

One of the Bicentenary prizes returns

During our Bicentenary year (1988) a special competition was run and a number of prizes were awarded. One of those prizes went to Melva ZL4IO. Recently, as part of a clean-up Melva decided that the time had come to offer her prize back to ALARA to be given into the care of someone else.

Margaret, VK4AOE had crocheted a lovely table centre incorporating a number of Australian birds and animals. in recognition of the uniqueness of Australia, in its Bi-centenary year.

The table centre will be one of the items some lucky person will take home from the ALARAMEET in Mildura later this year.

It may be one of the prizes in the Special Effort, or Marilyn may have some other plan for it, however it will be lovely for all those in Mildura to be able to see this beauty after so many year across the Tasman. Here is a photo to give you some idea of it.

DON'T FORGET THE SPECIAL EFFORT whether you can be in Mildura

Mavis Stafford, Bicentennial Trophy Consolation Prize donated by Margaret VK4AOE

Silent key

Ron MacNamara VK4ESC

Ron MacNamara, VK4ESC, passed away suddenly at home on the Sunshine Coast, Queensland, in the early hours of 18 February 2005. He was born at Earlwood in Sydney in 1929. Ron was educated at Sydney Grammar School and claimed the most important thing he learned there was to take nothing for granted and to question everything - a lesson he applied throughout life.

Ron began work as a trainee mechanic but soon left to work at the Australian Gaslight Company. He studied at night over several years to qualify as a Chartered Accountant and Chartered Secretary, then went to work in the Administration of Sydney University. He retired to the Sunshine Coast in 1984, where he immediately became the Radio Operator for the newly re-formed Peregian Surf Life Saving Club.

Ron's interests were varied. In his younger days he was a keen ice skater and rally car driver racing Peugeots. One special interest was flying. He gained his private pilot's licence in 1959, and held a general aviation licence for 46 years. With a partner, he owned a Grumman Traveller aircraft. Sailing was another passion. He was joint owner of a 27 foot Colombia which he enjoyed sailing on Sydney Harbour.

Ron was also fascinated by radio. He studied with the Australian Radio College and in 1953 graduated as a Radio Service Engineer. He was then attracted to amateur radio and was first licensed in 1982. Morse code was a big challenge to Ron, but he persisted and in February 1990 was issued with his full call VK4ESC. He was an active member of the Sunshine Coast Amateur Radio Club as an Auditor and WIA Exams Invigilator.

Ron is survived by his wife Laurie.

Contributed by Ron Marschke VK4GZ

Are you managing the estate of a 'Silent key'?

Please save any QSLs for the National QSL collection, but first contact:

The Hon. Curator,
Ken Matchett VK3TL
on
(03) 9728 5350
or email
jeandawson@iinet.net.au

Rare DX, special call-signs prefixes and suffixes, pictorials and pre-war QSLs are needed.

Let us save something for the history of amateur radio.

ALARA *continued*

or not. Just add the extra to your booking or send it separately, for a ticket. If you wish to donate something to the Special Effort, you can bring or send it to Marilyn between now and September.

A piece for the astromony buffs among you

from the "New Scientist"

Round about end of the 19th century there was a change of staff at the Harvard University. The University had undertaken the task of photographing the whole of the visible night sky and of cataloguing the objects captured on film. It was tedious and time- consuming work. What is more the astronomers at the telescopes were amassing photographic plates faster then they could be examined.

In 1877 Edward Pickering the Director in a fit of exasperation told the young men engaged in the task that 'his housekeeper could do a better job than they could". So he actually sacked the young men and employed an equal number of young ladies, including his housekeeper, only to find that they really did do a better job than the young men.

The ladies were more meticulous and careful than the men and were less likely to be distracted. As well as this, the women worked for half the pay of the men, an added bonus.

The names of some of these women are known to astronomers and cosmologists to this day. The housekeeper, Williamina Fleming found 10 of the 24 novas then known. Annie Jump Cannon catalogued roughly 5000 stars per month, calculating their location, colour and brightness of each one. A major contribution to the star charts, which with only minor modifications are still in use today.

An interesting sideline is that Pickering coined the word 'computers' to describe the men and women who studied the photographic plates.

The women were not allowed to use the telescopes, of course. It was not considered to be suitable work for their delicate constitutions and it would not be suitable at all for men and women to be spending the long night hours together! Nevertheless the 'computers' made many insightful scientific conclusions, just from their study of the plates.

Henrietta Leavitt, another member of the team was actually considered for a Nobel Prize in 1923, and some years after her death Edwin Hubble used her identification of the cepheids (a group of stars which regularly brighten and fade in brightness) to prove that the universe was expanding.

Some remarkable women doing a job exceedingly well.

Late news received 12 April 2005

Margaret VK3DML, one of the early members of ALARA became an SK after a battle with cancer. Our sympathy goes out to her family and friends.

ar

Correction to the April issue

The Special Event station for the Formula 1 Grand Prix held in Melbourne in March, as mentioned in last month's ALARA column, was run by the Eastern & Mountain District Radio Club. For the 10th consecutive year they used the callsign VI3GP, with QSLs going to the Club call of VK3ER.

Beyond our shores

David A. Pilley VK2AYD
davpil@midcoast.com.au

U.S.A.

Morse restructuring

It seems to be a long way off in the U.S.A.

The FCC continues to work toward developing a Notice of Proposed Rule Making (NPRM) that will spell out what the Commission has in mind with respect to possible changes in the current Morse code requirement and Amateur Radio licensing.

18 petitions have been filed. As far as the code issue is concerned, petitions--and comments in response to them--run the gamut from retaining or even beefing up the Morse requirement to eliminating it altogether. (The ARRL's proposal would retain the 5 WPM Morse examination for Amateur Extra class applicants only.) The League and others have also put forth proposals for a new entry-level Amateur Radio licence class.

The FCC appears unlikely to release an NPRM any sooner than mid-2005. Once public, the NPRM will initiate yet another round of public comments--this time on what the FCC has proposed. An FCC Report and Order to implement any new rules regarding Morse code and licence restructuring is unlikely before the second half of 2006, although it's possible the Commission could wrap up the proceeding before then.

(ARRL News)

Germany:

Changes in amateur regulations

Germany has recently announced changes in their Amateur Radio regulations. Some revisions stem from the outcome of World Radiocommunication Conference 2003, which essentially left it up to individual countries to decide if they wanted to continue to impose a Morse code requirement for HF access.

In Germany, the Deutscher Amateur Radio Club (DARC) reports that, effective February 19, there now are only two classes of amateur radio licence: Class A (formerly Class B and C) and Class E (formerly Class D). The new Class A works in accordance with the Harmonized Amateur Radio Examination Certificate (HAREC), T/R 61-02. It permits radio amateurs in participating European countries to go from one European nation to another and obtain a full licence.

Long time visitors or foreign residents with a CEPT licence in Germany will be issued a German Class A licence. The Class E licence remains limited to VHF/UHF frequencies only, with the addition of 10 GHz, output limited to 10 W EIRP. There also have been some changes to the spectrum allocation at 1.8 MHz. The text of the new regulations, in German, is available on the DARC Web site <http://www.darc.de/aktuell/afuv.pdf>.

(ARRL N/L 11/05)

Spain:

Changes to their licence

In Spain, the Unión De Radioaficionados Españoles (URE) reports two significant changes in that country's Amateur Radio regulations, effective March 3: Spain has deleted the Morse code requirement to obtain a Class A (General) or Class C (Novice) licence. Also, Class A (General) and Class B (Restricted) licensees now are allowed to use the band 50.0 to 51.0 MHz "under special and particular authorization."

(ARRL N/L 11/05)

Norway:

Gives hams limited 5 MHz access

Norwegian ham clubs will soon have limited access to the 5 MHz band.

Norway's Post and Telecommunications Authority has granted permission to Norwegian amateur radio club stations to operate on eight spot frequencies in the 5 MHz-band. This, for the period beginning April 1st of this year and running until December 31st of 2007.

According to reports, the operation will be fairly restricted. The permitted modes are upper sideband and CW, with a maximum transmitter power of 100 watts. The centre frequencies of the eight channels are 5.280, 5.290, 5.332, 5.348, 5.368, 5.373, 5.400 and 5.405 MHz, with the upper sideband 'dial frequency' being 1.5kHz lower in each case.

With this action Norway is added tothe growing list of nations offering their ham radio community at least a taste of operation at or near 5 MHz.

(ARNewsline)

Ham radio in space:

tracking Cubesats

Hams interested in space telemetry reception are invited to participate in a world-wide effort to support student groups that have designed and made CubeSats. These are satellites measuring 10 centimeters cubed and weighing less than 1 kilogram. A discussion group and a new website have been created to provide information on these educational CubeSats. They are at http://groups-beta.google.com/group/CubeSat and http://users.crosspaths.net/wallio/CubeSat.htm respectively.

(GB2RS)

'ar

Correction

Captions for figures in Lloyd Butler's *X3* article in AR April 2005 pages 18–20

Unfortunately during the processing of this article the Figure captions got seperated from the rest of the text. They are printed below for completeness. Apologies to the author.

VK5UE Editor.

The captions should have been as follows:

Fig 1 - VK5BR X3 antenna tuning and matching system.

Fig 2 - The 80 metre X3 antenna

Fig 3a - VK5BR X3 antenna alternative 20 metre assembly.

Fig 3b - VK5BR X3 antenna alternative 20 metre assembly.

Fig 4 - 10 metre X3 antenna.

Fig 5 - Open coil - typical magnetic field.

Fig 6 - H field test device.

Ian Godsil VK3JS

Contest Calendar May - July 2005

May	7/8	ARI Intl. DX Contest	(CW/SSB/RTTY)
	14/15	CQ-M Intl. DX Contest	(CW/SSB)
	21	VK/trans-Tasman 80m Phone Contest	
	21/22	Baltic Contest	(CW/SSB)
	21/22	King of Spain Contest	(CW)
	28/29	CQ WW WPX Contest	(CW)
June	4	VK/trans-Tasman 80m CW Contest	
	11	ANARTS WW RTTY Contest	(Digi)
	11	Portugal Day DX Contest	(SSB)
	11/12	South America CW Contest	
	11	Asia-Pacific Sprint Contest	(SSB)
	18/19	All Asian DX Contest	(CW)
	25/26	Marconi Memorial HF Contest	(CW)
July	1	Canada day Contest (CW/SSB)	
	9	VK/trans-Tasman 160 Metres Phone Contest	
	9/10	IARU HF World Championship	(CW/SSB)
	16/17	CQ WW VHF Contest	(All modes)
	23	VK/trans-Tasman 160 Metres CW Contest	

Summer VHF-UHF Field Day 2005: Results

Contest manager: John Martin VK3KWA

In my report on last year's Field Day, I mentioned that the event is gaining support. The trend has continued this year, and the Summer Field Day seems to have established itself as the most popular VHF-UHF event of the year. But the activity is still quite uneven. VK3, VK4 and VK5 are continuing to grow, but the other call areas - especially VK2 - where are you? Time to make your mark and put those bushrangers, crow-eaters and banana benders in their place!

Thanks to the entrants who made helpful suggestions about the rules. One frequent comment is that the six hour sections are too short, and eight hours would be better. Also, it isn't easy for anyone who can only operate on the Sunday - you need to start horribly early to fit in even six hours. The answer could be to extend the finishing time by a few hours on Sunday afternoon. Stations in the 24 hour sections could still operate as they do now, or choose their best 24 hours for scoring purposes.

One request regarding logs. Please remember that I need all of the information requested on the cover sheet - and that includes separate totals for each band. Otherwise I have to re-score your log, which isn't much fun.

Congratulations to the winners of each section, and to all entrants, especially the new ones who all made very good scores. Here's hoping that I will have an even bigger pile of logs to sort through next time.

Call	Name	6m	2 m	70 cm	23 cm	12 cm	9 cm	6 cm	3 cm	TOTAL
Section A: Single Operator, 24 Hours										
VK3KAI	P. Freeman	32	432	620	768	320	320	320	770	3582
VK5ADE	S. Cameron	133	408	675	1048	-	-	-	-	2264
VK5MX	M. Millar	133	408	675	1048	-	-	-	-	2264
VK5AIM	S. Mahony	131	1161	665	40	-	-	-	-	1997
VK4OE	D. Friend	34	471	425	520	480	-	-	-	1930
VK3HY	G. Brain	104	621	720	288	-	-	-	-	1733
VK3AFW	R. Cook	90	630	645	-	-	-	-	-	1365
VK5OQ	K. Gooley	51	186	290	168	-	-	-	-	695

Section B: Single Operator, 6 Hours

VK3KAI	P. Freeman	32	411	530	656	320	320	320	770	3359
VK3HV	G. Francis	44	294	340	528	-	-	-	320	1526
VK3YDK	K. Allan	45	228	300	456	-	-	-	320	1349
VK3UBM	M. Borthwick	21	195	325	-	540	-	-	-	1081
VK3YFL	B. Dunkley-Smith	43	336	450	-	-	-	-	-	829
VK4KZR	R. Preston	-	111	-	280	220	-	-	-	611
VK5OM	J. Bywaters	-	219	160	168	-	-	-	-	547
VK4DFG	H. Debnam	-	261	105	-	-	-	-	-	366
VK4EV	R. Everingham	54	171	105	-	-	-	-	-	330
VK3JS	I. Godsil	40	108	180	-	-	-	-	-	328
VK5AR	A. Raftery	22	93	120	56	-	-	-	-	291
VK5DC	D. Cavies	-	84	45	-	-	-	-	-	129

Section C: Multi Operator, 24 Hours

VK3ATL	GARC (1)	105	603	920	856	730	210	210	340	3974
VK3PK	(2)	76	522	575	368	250	-	-	-	1791
VK5SR	SERG (3)	72	450	345	280	230	-	-	270	1607
VK3EG	EGARC (4)	27	390	585	496	-	-	-	-	1498
VK2AES	(5)	-	273	255	-	-	-	-	-	528

Section D: Multi Operator, 6 Hours

VK3AWT	(6)	78	387	455	-	-	-	-	-	920

Section E: Home Station, 24 Hours

VK3HZ	D. Smith	-	762	1000	720	-	-	-	-	2482
VK3UH	L. Mostert	63	501	580	600	-	-	-	-	1744
VK3CAT	A. Middleditch	61	189	310	-	-	-	-	-	560
VK3TRD	D. Rolfe	-	159	240	-	-	-	-	-	399
VK5FD	A. Dunn	35	108	175	-	-	-	-	-	318

(1) Geelong ARC: K. Jewell VK3AKK, C. Gnaccarini VK3PY, D. Learmonth VK3XLD

(2) L. de Vries VK3PK, D. Paterson VK3HPD

(3) South East Radio Group: C. Hutchesson VK5DK, C. Prime VK5XCP, T. Niven VK5NC, T. Aubrey VK5EE

(4) East Gippsland ARC: R. Ashlin VK3EK, D. Pendergast VK3DMP, P. McMahon VK3CGR, R. Donnan VK3HAP, N. Mifsud VK3DUT

(5) A. Sayers VK2AES, D. Hughes VK2DSH, R. Manning VK1JRM

(6) A. Tubb VK3AWT, J. Bramham VK3WWW

Ross Hull Memorial VHF-UHF Contest 2004 - 2005: Results

Contest manager: John Martin VK3KWA

This year there were major changes in the contest rules. The main section is now a four band VHF-UHF section, with the more specialised areas of Microwaves and Digital Modes now in separate sections. The aim of these changes was to make the contest more appealing to the many amateurs who don't have the scoring advantages of microwave or digital operators. The result would hopefully be more activity on bands like 2 metres and 70 cm. It was also hoped that the separate Microwave and Digital Modes sections would attract more logs from amateurs who prefer to concentrate their activity in these areas.

The result has been a small increase in the number of logs, but the big revival on bands like 2 metres still hasn't happened. But on the positive side, this year's contest attracted some new entrants, and the scores show that there are still plenty of contacts to be made.

Now to the results. In Section A we have a first-time winner. Congratulations to Len Mostert VK3UH. He has been a regular entrant for some years, and this year's win is well deserved. In the Microwave section, first place goes to George Francis VK3HV, followed closely by Peter Freeman VK3KAI. And in the Digital Modes section, Rex VK7MO has scooped the pool. Not a very big pool - more competition needed here - but this is an excellent result given Rex's location.

I also offered a special "Single Rig Award" for any station using a single radio for all bands, and running no more than 100 watts. This has been won by Ron Cook VK3AFW, who also came second overall in Section A. This proves it - you don't need big power to do very well in this contest. Please spread the word, and hopefully we'll see a lot more activity from medium-powered stations next year.

In Memoriam

Roger Steedman

VK3XRS

Record 6 time winner of the contest 1990 - 1995

Passed away October 2004

Ross Hull Contest 2004 - 2005

Call	Name	6 m	2 m	70 cm	23 cm	12 cm	9 cm	6 cm	3 cm	TOTAL
Section A: VHF-UHF (6m - 23cm)										
VK3UH	L. Mostert	168	990	680	520	-	-	-	-	2358
VK3AFW	R. Cook	44	978	535	-	-	-	-	-	1557
VK3HV	G. Francis	52	234	215	304	-	-	-	-	805
VK3KAI	P. Freeman	7	192	210	248	-	-	-	-	657
VK4CDI	P. Moat	-	405	215	-	-	-	-	-	620
VK2TG	R. Demkiw	66	315	210	-	-	-	-	-	591
VK3YFL	B. Dunkley-Smith	8	117	160	-	-	-	-	-	285
VK3HY	G. Brain	43	132	80	10	-	-	-	-	265
VK4KZR	R. Preston	-	33	35	40	-	-	-	-	108
VK7MO	R. Moncur	9	66	-	-	-	-	-	-	75
VK5FD	A. Dunn	11	18	25	-	-	-	-	-	54
VK2CZ	D. Burger	1	-	-	-	-	-	-	-	1
VK4TGL	G. Lawler	Check log								
Section B: Microwaves (23cm and above)										
VK3HV	G. Francis	-	-	-	304	-	-	-	20	324
VK3KAI	P. Freeman	-	-	-	248	10	10	10	40	318
VK4KZR	R. Preston	-	-	-	40	20	-	-	-	60
Section C: Digital modes, All Bands										
VK7MO	R. Moncur	-	1560	-	-	-	-	-	-	1560

Ross Hull Contest: List of Winners, 1950 - 2005

1950 - 1951	VK5QR	R. Galle	1978 - 1979	VK4DO	H. L. Hobler
1951 - 1952	VK5BC	H. Lloyd	1979 - 1980	VK3ATN	T. R. Naughton
1952 - 1953	VK4KK	A. K. Bradford	1980 - 1981	VK6KZ	W. J. Howse
1953 - 1954	VK6BO	R. J. Everingham	1981 - 1982	VK6KZ	W. J. Howse
1954 - 1955	VK4NG	R. Greenwood	1982 - 1983	VK6KZ	W. J. Howse
1955 - 1956	VK3GM	G. McCullough	1983 - 1984	VK6KZ	W. J. Howse
1956 - 1957	VK3ALZ	I. F. Berwick	1984 - 1985	VK3ZBJ	G. L. C. Jenkins
1957 - 1958	VK3ALZ	I. F. Berwick	1985 - 1986	VK3ZBJ	G. L. C. Jenkins
1958 - 1959	VK3ALZ	I. F. Berwick	1986 - 1987	VK3ZBJ	G. L. C. Jenkins
1959 - 1960	VK4ZAX	D. R. Horgan	1987 - 1988	VK5NC	T. D. Niven
1960 - 1961	VK3ARZ	W. Roper	1988 - 1989	VK5NC	T. D. Niven
1961 - 1962	VK5ZDR	M. J. McMahon	1989 - 1990	VK3XRS	R. K. W. Steedman
1962 - 1963	VK4ZAX	D. R. Horgan	1990 - 1991	VK3XRS	R. K. W. Steedman
1963 - 1964	VK5ZDR	M. J. McMahon	1991 - 1992	VK3XRS	R. K. W. Steedman
1964 - 1965	VK3ZER	R. W. Wilkinson	1992 - 1993	VK3XRS	R. K. W. Steedman
1965 - 1966	VK3ZDM	J. R. Beames	1993 - 1994	VK3XRS	R. K. W. Steedman
1966 - 1967	VK5HP	J. H. Lehmann	1994 - 1995	VK3XRS	R. K. W. Steedman
1967 - 1968	VK3ZER	R. W. Wilkinson	1995 - 1996	VK2FZ/4	A. Pollock
1968 - 1969	VK5ZKR	C. M. Hutchesson	1996 - 1997	VK2FZ/4	A. Pollock
1969 - 1970	VK3ZER	R. W. Wilkinson	1997 - 1998	VK2FZ/4	A. Pollock
1970 - 1971	VK4ZFB	E. F. Blanch	1998 - 1999	VK3XPD	A. P. Devlin
1971 - 1972	VK5SU	J. W. K. Adams	1999 - 2000	VK3EK	R. G. Ashlin
1972 - 1973	VK5SU	J. W. K. Adams	2000 - 2001	VK4TZL	G. R. McNeil
1973 - 1974	VK5SU	J. W. K. Adams	2001 - 2002	VK4TZL	G. R. McNeil
1974 - 1975	VK5SU	J. W. K. Adams	2002 - 2003	VK3EK	R. G. Ashlin
1975 - 1976	VK5SU	J. W. K. Adams	2003 - 2004	VK3EK	R. G. Ashlin
1976 - 1977	VK4DO	H. L. Hobler	2004 - 2005	VK3UH	L. Mostert
1977 - 1978	VK3OT	S. R. Gregory			

ar

Gridsquare Standings at 21 March 2005

144 MHz Terrestrial

VK2FLR	Mike	113
VK3FMD	Charlie	103
VK2KU	Guy	102
VK2ZAB	Gordon	78 SSB
VK3KAI	Peter	78
VK2KU	Guy	69 SSB
VK3CY	Des	68
VK3PY	Chas	68 SSB
VK3HZ	David	64
VK2DVZ	Ross	62 SSB
VK2TK	John	62
VK3EK	Rob	62 SSB
VK3XLD	David	55 SSB
VK2EI	Neil	54
VK3TMP	Max	53
VK3BJM	Barry	51 SSB
VK3ZLS	Les	51 SSB
VK3BDL	Mike	50
VK7MO	Rex	48
VK2DXE	Alan	47
VK2KU	Guy	47 Digi
VK3KAI	Peter	47 SSB
VK3WRE	Ralph	46 SSB
VK2DXE	Alan	43 SSB
VK3CAT	Tony	40
VK3KEG	Trevor	39
VK4TZL	Glenn	38
VK2TK	John	35 SSB
VK3KAI	Peter	35 Digi
VK4KZR	Rod	35
VK3ZUX	Denis	33 SSB
VK6HK	Don	33
VK3ZYC	Jim	31
VK7MO	Rex	30 SSB
VK4CDI	Phil	29
VK3KME	Chris	28 SSB
VK4CDI	Phil	28 SSB
VK2KRR	Leigh	27 FM
VK2TK	John	27 Digi
VK4DFE	Chris	26 SSB
VK3BBB	Brian	25
VK7MO	Rex	25 Digi
VK2TG	Bob	24 SSB
VK3YB	Phil	23
VK5ACY	Bill	23 SSB
VK2EAH	Andy	22
VK3HV	George	21 SSB
VK3TLW	Mark	20 SSB
VK6KZ	Wally	20
VK3AL	Alan	18 SSB
VK6KZ/p	Wally	16
VK3ZYC	Jim	14 SSB
VK2EAH	Andy	13 SSB
VK3DMW	Ken	13
VK2CZ	David	12
VK7ZSJ	Steve	12
VK2EI	Neil	11 Digi
VK2DXE/p	Alan	10
VK3ANP	David	10
VK3BG	Ed	10
VK2EAH	Andy	9 Digi
VK6HK	Don	6 Digi
VK2TWO	Andrew	5
VK3ZDR	David	5 SSB
VK2AKR	Neil	3 Digi
VK2DXE	Alan	3 Digi
VK4TJ	John	3 SSB
VK6DXI	Mirek	3 FM
VK2AKR	Neil	1 SSB
VK3XLD	David	1 Digi
VK4CDI	Phil	1 Digi

144 MHz EME

VK2KU	Guy	112
VK2FLR	Mike	110
VK7MO	Rex	106 Digi
VK3CY	Des	70
VK2KRR	Leigh	24
VK3HZ	David	11
VK4CDI	Phil	5
VK3KEG	Trevor	4
VK3FMD	Charlie	3
VK2DVZ	Ross	2
VK2DXE	Alan	2

432 MHz Terrestrial

VK2ZAB	Gordon	57 SSB
VK3PY	Chas	50 SSB
VK3FMD	Charlie	47
VK3XLD	David	47 SSB
VK3ZLS	Les	40 SSB
VK2KU	Guy	38
VK2KU	Guy	34 SSB
VK3EK	Rob	34 SSB
VK3HZ	David	34
VK3CY	Des	32
VK2DVZ	Ross	31 SSB
VK3BJM	Barry	31 SSB
VK3KAI	Peter	29
VK3KAI	Peter	28 SSB
VK3BDL	Mike	26
VK3WRE	Ralph	26 SSB
VK3TMP	Max	25
VK3KEG	Trevor	21
VK2TK	John	18
VK2TK	John	17 SSB
VK7MO	Rex	17
VK3ZUX	Denis	15 SSB
VK3CAT	Tony	14
VK4KZR	Rod	14
VK3TLW	Mark	13 SSB
VK6KZ	Wally	13
VK2KRR	Leigh	11 FM
VK4TZL	Glenn	11
VK3AL	Alan	10 SSB
VK3ANP	David	10
VK3BG	Ed	10 SSB
VK3YB	Phil	10
VK2TG	Bob	9 SSB
VK3BBB	Brian	9
VK4DFE	Chris	9 SSB
VK3KME	Chris	8 SSB
VK4CDI	Phil	8
VK6KZ/p	Wally	8
VK2FLR	Mike	6
VK7MO	Rex	6 Digi
VK2KU	Guy	5 Digi
VK3HV	George	5 SSB
VK3KAI	Peter	4 Digi
VK3PY	Chas	4 Digi
VK3XLD	David	4 Digi
VK3ZYC	Jim	4 SSB
VK2CZ	David	3
VK2TWO	Andrew	3
VK6DXI	Mirek	3
VK2DXE/p	Alan	2
VK4TJ	John	2 SSB
VK2AKR	Neil	1 SSB
VK2TK	John	1 Digi
VK3DMW	Ken	1

432 MHz EME

VK4KAZ	Allan	14 CW
VK3FMD	Charlie	5
VK3HZ	David	3
VK7MO	Rex	1

1296 MHz

VK3XLD	David	35 SSB
VK3PY	Chas	34 SSB
VK3FMD	Charlie	32
VK2ZAB	Gordon	29 SSB
VK3ZLS	Les	26 SSB
VK2KU	Guy	25
VK2KU	Guy	22 SSB
VK3EK	Rob	20 SSB
VK3KWA	John	19
VK3KAI	Peter	17
VK2DVZ	Ross	16 SSB
VK3KAI	Peter	16 SSB
VK3WRE	Ralph	16 SSB
VK3BDL	Mike	12
VK3BJM	Barry	12 SSB
VK3TMP	Max	11
VK2TK	John	10 SSB
VK3HZ	David	10
VK4KZR	Rod	10
VK7MO	Rex	10
VK3TLW	Mark	8 SSB
VK3AL	Alan	7 SSB
VK2CZ	David	5
VK3HV	George	5 SSB
VK3ZUX	Denis	5 SSB
VK3ZYC	Jim	5
VK6KZ/p	Wally	5
VK3BG	Ed	4 SSB
VK3BVP	Shane	4
VK3YB	Phil	4
VK3ZYC	Jim	4 SSB
VK6KZ	Wally	4
VK2KU	Guy	3 Digi
VK3BBB	Brian	3
VK3KEG	Trevor	3
VK2DXE/p	Alan	2
VK2FLR	Mike	2
VK3CY	Des	2
VK3KAI	Peter	2 Digi
VK3KME	Chris	2 SSB
VK3XLD	David	2 Digi
VK4TJ	John	2 SSB
VK6DXI	Mirek	2
VK3DMW	Ken	1
VK3ZYC	Jim	1 Digi
VK4TZL	Glenn	1
VK7MO	Rex	1 Digi

2.4 GHz

VK3PY	Chas	11 SSB
VK3XLD	David	11 SSB
VK3WRE	Ralph	9 SSB
VK3FMD	Charlie	8
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK3HV	George	4 SSB
VK6KZ	Wally	4
VK3BJM	Barry	3 SSB
VK3HZ	David	2
VK3KAI	Peter	2 Digi
VK4KZR	Rod	2
VK3BG	Ed	1 SSB
VK3TLW	Mark	1 SSB
VK3ZUX	Denis	1 SSB
VK4TZL	Glenn	1

3.4 GHz

VK3FMD	Charlie	8
VK3WRE	Ralph	6 SSB
VK3KAI	Peter	5 SSB
VK3HV	George	4 SSB
VK3XLD	David	4 SSB
VK6KZ	Wally	4
VK3EK	Rob	3 SSB

5.7 GHz

VK3FMD	Charlie	10
VK3WRE	Ralph	9 SSB
VK3KAI	Peter	7 SSB
VK3XLD	David	5 SSB
VK6KZ	Wally	4
VK3BJM	Barry	2 SSB
VK3EK	Rob	2
VK3HV	George	2 SSB
VK6BHT	Neil	2 SSB
VK3KAI	Peter	1 Digi
VK3ZUX	Denis	1 SSB

10 GHz

VK3FMD	Charlie	9
VK6BHT	Neil	9 SSB
VK3WRE	Ralph	8 SSB
VK3XLD	David	8 SSB
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK6KZ	Wally	5
VK3HV	George	4 SSB
VK3PY	Chas	4 SSB
VK3TLW	Mark	3 SSB
VK3ZYC	Jim	3 SSB
VK2EI	Neil	2 SSB
VK3BJM	Barry	2 SSB
VK3ZUX	Denis	2 SSB
VK7MO	Rex	2
VK3BG	Ed	1 SSB
VK4KZR	Rod	1
VK4TZL	Glenn	1

24 GHz

VK6BHT	Neil	3 SSB
VK2EI	Neil	2 SSB
VK3FMD	Charlie	2
VK6KZ	Wally	2

474 THz

VK7MO	Rex	1

Additions, updates and requests for the guidelines to Guy VK2KU, vk2ku@tsn.cc, or by mail (QTHR 2005).

The guidelines (and the latest League Table) are also available on the website of the NSW VHF Dx Group at www.vhfdx.radiocorner.net - click on Gridsquares.

Next update of this table will be in early July 2005.

Stations who do not confirm their status for more than 12 months may be dropped from the table.

ar

Guy **Fletcher** VK2KU

New-look AMSAT-NA website

The worldwide amateur radio satellite fraternity is fortunate indeed to have the volunteer services of people like Emily Clarke W0EEC.

Emily has only been into amateur radio for a short time but quickly discovered amateur radio satellites and immediately volunteered to revamp the AMSAT-NA website.

If you haven't visited the site for a while you really should do so. It's been totally worked over in what must have been a very time consuming exercise for Emily and her team of beta testers. The new format is comprehensive and easy to navigate. You will find sections on every aspect of AMSAT activities and links to other sites of interest to satellite enthusiasts.

The really great thing is that Emily regularly monitors and contributes to the AMSAT-BB so feedback on changes to the site was always forthcoming during the re-build exercise. The result is there for all to see and has generally been hailed as a welcome change for the better and in keeping with best practice. Thanks Emily.

SSETI-Express news

No, this has nothing to do with the search for extraterrestrial intelligence. That's SETI. The SSETI Express (Student Space Exploration and Technology Initiative - Express) mission is an educational mission.

It will deploy CUBESAT pico-satellites developed by various universities. These pico-satellites will take pictures of Earth and act as a test-bed and technology demonstration for hardware devices related to the complementary project, the European Student Earth Orbiter.

Three cubesats will be part of this first SSETI Express exercise. They will be deployed from a specially designed launcher carried aboard a Kosmos-3M launch vehicle fired from the Pletsesk Cosmodrome sometime this year.

The 3 pico-satellites are "XI-V" from Japan, University of Tokyo, "UWE 1" from Germany, University of Wiirzburg and "Ncube 2" from Norway, Andoya Rocket Range.

AMSAT-UK Chairman Martin Sweeting, G3YJO, announced last year that an Amateur Radio transponder will be part of the SSETI Express satellite. Onboard will be a 2.4 GHz transmitter and a 437 MHz receiver. The pair will be commissioned as an amateur FM voice transponder after the transmitter serves initial telemetry duty.

The transmitter was built by Sam Jewell, G4DDK, David Bowman, G0MRF, and Jason Flynn, G7OLD. The team also developed the switch-mode power supply and control interfaces with assistance from Graham Shirville, G3VZV. Charles Suckling, G3WDG, has completed the 3 W 2.4 GHz power amplifier, which is identical to the one flying in the recently launched AO-51 "Echo" spacecraft.

The receiver will be supplied by Holger Eckart, DF2FQ. The final testing stage of this project has now been reached and we can expect a launch some time soon.

Only time will tell when the transponder will be activated so keep your eyes on the AMSAT web sites for news of this exciting project.

April AR has pictures on the inside back cover and some other info on page 39.

AO-51 changes

Mike Kingery, KE4AZN sent this report on behalf of the Echo Command Team. If you are an Echo fan you will have caught up with these changes already but here they are for the benefit of those thinking about having a go.

"All required software is loaded back up on AO-51 and running. The FM repeater and the PBBS will be turned back on for user activity immediately. One item that is being tested is the PBBS call sign. You will need to change your Wisp or PB setup for AO-51 to reflect the change in the call sign. Replace PACB-11 and PACB-12 with PECHO-11 and PECHO-12. P for PacSat, and ECHO for, well, I hope you can figure that one out".

Those changes were signalled in mid-March. If you are interested in starting to operate with Echo I'd suggest the best way to "bone-up" is to visit the AMSAT-NA web site. There is a front page section devoted to the latest comings and goings on Echo. It expands into a complete description of the entire project. Even at this stage many features on this satellite are still being commissioned and the scene can change from week to week. The web-site reference source is invaluable.

This satellite is shaping up to be an experimenter's delight. Thanks go to Mike and his team.

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

The old rules don't change

This submission deals with something that has not been a real problem here but is evidently endemic in some parts of the world. Maybe it's because we are better mannered or perhaps it's because there aren't as many of us. Whatever the reason it's worth a mention here because there are always newcomers to the field and they should be looking for guidelines.

I refer to the dubious practice of calling for contacts via the satellites when you can't hear the satellite signal! Common sense would deem this to be a fruitless exercise but there doesn't seem to be a website for common sense. Instances have been reported of people calling repeatedly even when the satellite is not in their sky. That particular practice says more about their basic understanding of what's going on rather than manners. Of course it's fruitless to call when the satellite isn't in your area. If you don't

Spotlight on SWLing

Robin Harwood VK7RH

Farewell to one station and two prominent people

The Antigua broadcasting relay station, jointly operated by the BBC and DW, was closed down on Sunday March 27th. The site is now up for sale.

Many Australasian listeners to the German Service relied on this strong signal on 11795 in the early local evening. The BBC did not specifically target this region from there, mainly concentrating on North, Central and South America. Following the closure of Antigua, both organisations have commenced using the Bonaire facilities of Radio Netherlands, plus the French Guyana relay of Radio France International. For example DW German service, between 0200 and 0600 on 9735 now alternates between the two sites. The broadcast to the South Pacific from 0600 now comes direct from Germany.

Coincidentally, the BBC External Services also chose this date to significantly reduce its shortwave output to South America and Europe. Broadcasts will now be in the morning and evening period instead of being almost around the clock. The DW cutbacks have not been as severe as first thought, with the relays via Siberia continuing on 7430 and 9900 in German. However the audio does not seem as clear as previously.

I also notice the BBC relay from Thailand on 7105 from 2200, now clashes with DW in an Eastern European language. The BBC W/S Singapore relay on 9740 in our local evenings, used to be another clear channel but another Asian station has appeared and I cannot yet determine who it is. It probably is from China.

The death of Pope John Paul II on Saturday April 9th was extensively covered by the majority of international stations and subsequently influenced programming, particularly from European stations. I expect that this coverage will continue, up to the election by the Conclave of the new Pontiff. There were so many stations broadcasting the funeral service live on the 8th at 0800 and the audio delay, caused by many satellite hops, was particularly noticeable.

I also noted in March, the death of Dr. Gene Scott. He has been broadcasting on shortwave around the clock via WWCR, from the CIS and from the Caribbean island of Anguilla. However you would not know this as they are continuing to broadcast taped repeats of his "sermons". I am hearing them on 13845 at 2200 via WWCR in Nashville.

I should be in a position shortly to recommence medium wave Dxing, following a recent decision on the ABA for Launceston's three AM stations to move to FM. I have a 5 kW sender pretty close by on 1008 and will thankfully no longer have spurs. 18 months has been given for this changeover. The FM band in this region is becoming crowded. I expect that this coverage will continue, up to the election by the Conclave of the new Pontiff.

Well that is all for this month. Keep listening and 73- de VK7RH

ar

AMSAT *continued*

know where it is then it could be on the other side of the world. That's just a matter of becoming familiar with some basic geometry and having faith in a tracking system.

The practice of calling even when you can't hear a signal runs deeper than that. It may just be a case of over-enthusiasm in a newcomer but more likely it will be because the operator hasn't paid enough attention to their receiving station. Even going back to the 1940s and 50s there was a saying, "If you can't hear 'em, you can't work 'em". In those days everyone built their own gear and the amateur's first project was always a good receiver. Nowadays the basic station unit is a commercial transceiver of some sort so that shouldn't be a problem.

Many people start off in amateur radio satellites still not realising that we are dealing with quite weak signals. Sometimes just a few milliwatts to begin with and often from distances of several thousand kilometres.

If you are serious about this endeavour you had better pay serious attention to your entire receive chain. You will hear stories - and this is part of the problem - of being able to work this or that satellite with a hand-held transceiver and rubber duckie. This may well be true under ideal circumstances. I've done it myself. But you can't rely on such a simple station to give good results all the time on all the satellites and invariably the operator will end up not being able to hear the satellite signal. This is when the above situation can arise. The operator can't hear the satellite but decides to "have a go anyway". The result is unnecessary QRM and no hope of a contact.

There are plenty of good texts available for beginners. Martin Davidoff's "The Radio Amateur's Satellite Handbook", published by ARRL is still the one to go for if you are thinking of getting into satellites. The AMSAT-NA web-site has an excellent beginner's section. All the above points are covered in detail in those and other publications. They are all written by experienced amateurs who have "been there and done that". Why re-invent the wheel.

ARISS alive and well

Tony VK5ZAI advises that a new round of school contacts is being organised for the expedition-11 crew on the ISS.

In recent times the "tele-bridge" technique has been used with great success. The use of Internet connections has freed up the school contact scheme from one of its original great drawbacks, timing. Going back to the days of MIR, school contacts were organised on the basis of the spacecraft being within radio range of the school or group at the time of the contact. Great if it can be organised but suitable passes cannot be ordered in advance and passes in school hours - or even reasonable hours - happen only occasionally.

This round however Tony hopes to include a live contact with an Australian school. Keep your eye on the ARISS website for late breaking details. It's hoped to take place between May and July and the ISS side of the contact will be available directly on 2 metres over most of Australia. The school side will be carried as usual on Echolink using the AMSAT or EDU_NET conference servers.

ar

David Smith VK3HZ
vk3hz@wia.org.au
Leigh Rainbird VK2KRR
vk2krr@telstra.com

Weak Signal

David Smith VK3HZ

There have been a few good openings during the month, but things are starting to drop off now. It might soon be time to pull down the antennas for a bit of a brush-up, to be ready for next season.

In the south of the country, there have been some great openings on 144 MHz and above between Adelaide and Albany. During the week of 19-26 March, several stations including VK5's USB, RO, ZBK, and UBC, and worked Wally VK6WG on 2 m and 70 cm. VK5's AKK and ZLX worked him on 2 m only. Steve VK5ZBK also worked Wally on 23 cm. Wally was hearing the Adelaide 23 cm beacon at the time. Brian VK5UBC also worked Frank VK6DM and Bob VK6BE, both on 2 m. On the evening of 22/3, the opening extended to Mt Gambier with Wally working Colin VK5DK on both 2 m and 70 cm.

On the morning of 1/4, the bands opened between Melbourne and Adelaide. The 2 m, 70 cm and 23 cm beacons on Mt Lofty were audible in Melbourne well into the morning. VK3's HZ and AFW were at the Melbourne end and worked VK5's UBC, USB, JL, ZK, ATW and VK3LY on 2m. VK3HZ also worked VK5UBC on 70cm.

On the evening of 2/4, Ross VK2DVZ reports working Nick ZL1IU on 2m. It was a difficult QSO with heavy QSB and very late in the season for such an opening.

VK0MT Macquarie Island Activity

Further to last month's report, and as reported below in the Digital DX Modes section, Dave VK0MT on Macquarie Island also managed to work three VK3 stations on 2 m FSK441 Meteor Scatter. The last time VK0 was worked from VK3 on 2 m was in late 1986 during a Sporadic E opening. Using digital modes, it is now possible, from VK3 at least, to work all VK call areas on 2 m at any time, provided that someone is active at the other end, of course! The VK3 stations that worked VK0MT all completed the requirements for the WAVKCA award. Thanks must go to Rex VK7MO who ably assisted in this by activating VK9 and being instrumental in the activation of VK0.

VK/ZL Propagation Logger

Adam VK4CP reports that the VK/ZL Logger has a new (permanent) home at: www.vklogger.com. Hopefully this URL will be very easy to remember. The logger is being hosted on a new server that should be much more reliable than in the past.

Unfortunately, following a crash on the old server, all of the Operator Info and Grid Squares tally data was lost. If you were registered there before, or if you're an active VHF/UHF operator, please enter your information on the new site for the benefit of others.

A new feature with this reincarnation is the Discussion Forums: www.vklogger.com/forum/ where ongoing discussions can take place in an organised manner. A number of forums and sub-categories have been set up to begin with, but Adam would welcome any suggestions on how these could be renamed or organised to best suit you. Adam can be contacted at ham@vk4cp.com.

EME

Congratulations to Alan VK3XPD who recently achieved his first 10 GHz EME contact during the DUBUS EME contest, working Jim WA7CJO on 10.368.1 MHz CW. An attempt to make contact using SSB was thwarted by the moon descending behind the trees at Jim's end.

Alan is located in suburban Melbourne and is running 75 Watts into a 3 m dish, with frequency locked to GPS. He has made significant improvements to the system recently and now has 12.5 dB of Sun Noise and circa 0.9 dB of Moon noise - close to the optimum, although still slightly down on Sun Noise. Alan reports that the major shortcoming now is his CW ability (or lack thereof).

Going even higher in frequency, on 16/4, the first EME contact on 47 GHz was achieved by the team of AD6FP, W5LUA and VE4MA at one end and RW3BP at the other.

RW3BP is running 100+ watts to a 2.4 m dish, while the others are running 30 watt TWTs to 1.8 and 2.4 m dishes. The RW3BP setup equates to a staggering 77+ megawatts EIRP. Noise figures of all stations are in the 3.5 to 4.7 dB range.

Since the Doppler shift can be as much as 100 kHz at 47 GHz, one must continuously adjust the receive frequency to keep the station centred in the passband. Precision frequency control was obtained by using GPS controlled, Rubidium locked, or TV sync controlled phase locked local oscillators.

Beacons

The VK5RSE 144.550 MHz beacon on Mt Graham, 40 km NW of Mt Gambier, has had some much-needed refurbishment work carried out by the South East Radio Group over the last month, after it was found to be only putting out 1.5 watts into antennas that were looking rather second hand. It is now running 25 watts into 4 new DL6WU-style 5-element yagis, pointing east, west, northeast and northwest. Signal reports are requested to Colin VK5DK at vk5dk@internode.on.net.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Trans-Tasman Contest

(See April AR page 42 for details)

80 m

Phone: May 21st,
CW: June 4th

160 m

Phone: July 9th
CW: July 23rd

The Magic Band – 6 m DX

Brian Cleland – VK5UBC

Summary of the Australian DX season

Another 6 m DX summer season has come and gone. In VK5 the band started to come to life in early November with the first opening occurring on the 8th November 2004 into the Brisbane area of VK4, with Jeff VK8GF at Alice Springs also worked. From this point on the band was open to some part of Australia from VK5 with either stations worked or beacons heard on most days until late February 2005. It is noticeable though that once the Christmas holiday period was over the number of active stations decreased, but openings were still prevalent with the band being open from VK5 to VK4 for long periods on many days in February. Wayne VK4WS became a regular in February with S9+ signals on many days.

As an indicator of activity, below is a summary table of interstate stations worked at my home QTH of Gawler (PF95jj):

Call Signs	Contacts	Worked
VK1	1	2
VK2	37	90
VK3	5	11
VK4	39	113
VK6	13	35
VK7	10	19
VK8	1	3 (VK8GF)
VK9	1	3 (VK9NS 18/12/04)
TOTAL	107	276

It should be noted I had several other contacts (approx 100) from my portable QTH Corny Point (PF85mc) but that log is not computerised and has not been included in the above table.

I think the table above indicates that VK6 activity is poor and on many occasions the Perth beacon was S9 but there were no stations to work. VK3 activity may seem low but it must be realized that it is short skip from this QTH and there are not a lot of openings. I also think that there were very few regularly active stations from VK5.

On many days all states were worked and Christmas and Boxing days were exceptional if you could drag yourself away from the turkey and pudding.

International DX

From an international point of view, I can only report on what I heard or worked. In summary I managed to work 2 x KH6 stations on the 9 Nov 2004. JA's were also worked on the 21st Nov 04, 11th Feb and 7th March 05 with the best opening being the 11th Feb when 11 x JA stations in 5 call areas were worked. Frustratingly the FK8 beacon could be heard on many occasions but only twice were stations available to be contacted. On the 30th Nov FK8GX was worked and on Xmas morning FK8HA was into SA and Queensland causing a large pile up. New Zealand stations were worked on many occasions with very strong signals (up to S9+20). In total 15 different stations were contacted with a total of 32 contacts on 10 different occasions.

Peter VK6KXW reports: "I can ruefully say 'What DX?'" It's been shocking on 6 m into Perth. Even Graham VK6RO has been conspicuous by his absence. So looking at my log book:

31/10/04 - JA5CMO 5/7

8/11/04 - VK6JR (Wayne - Margaret River) heard me 4x2 backscatter on AU he was also hearing VK6RPH/b with a lot of buzz on signal.

Christmas period Nov/Dec - VKs 2,3,4,5,7,8 worked with a lot of effort!

24/12/04 - ZL2AAA Morie 4x3 was the high light of the season.

7/2/05 - VK4AFL 4x1, VK4WS 4x2 was the last DX contact I had.

This March/April TEP has seen the usual 48/49 video coming in along with Skymet genesis software meteor radar at Learmouth solar observatory – 1050 km north of Perth, 6kw pep, 1 or 2 el yagis illuminate the sky centred on 35.250 MHz wideband.

This info is via Dr Tony Mann to whom I give credit and the very excellent professional email newsletter of the ICDX Yahoo group at http://groups.yahoo.com/group/icdx/.

Joe VK7JG reports: "Sorry there have been no 6 m happenings in VK7 for the past two months. I monitor 50.11 whenever I am in the workshop. January had some good openings to VK4 but that is too far back. On the 21st Jan I worked you and VK6ZKO.

9th Feb worked VK4WS and YRS, 15th worked VK4WS again Sporadic E.

23rd Feb Tropo opening VK3YDK.

24th Feb. VK4TWR, I was his first VK7 on 6m and VK4JOO . That was the last time 6m was open into VK7.

Wayne VK4WS (Brisbane) reports a very different story. On 7/2, VK6KXW and VK6JR. On 25/2 DS4EOI. On 10/3 6K2DHP (Korea). And between mid February and mid March, a total of 238 JA contacts.

Thanks Wayne – oh to live a little further north. Wayne's report did not include his usual interstate openings (VK2, 3 and 5). I'm also aware that there have been many good international openings to Japan, China, and Korea etc, from FNQ. I hope to be able to get more info for future notes.

Another good opening from JA to VK4 (Brisbane) on the 13 April. Wayne VK4WS reports working 13 JA's in 6 call areas with the JA beacons being audible for hours.

Richard VK5USB worked VK4WS, AFL and YRS on 29th March.

At my QTH the Alice Springs beacon was up to S9 on the morning of the 15 April.

Please remember to send any 6 m DX information to Brian VK5UBC at bcleland@picknowl.com.au. I can only report what I know.

Silent keys

reported to NSW in April.

We are sad to announce the passing of:

Ray Milliken VK2SRM of Raymond Terrace

Tom Davis VK2STD of Raymond Terrace

Geoff Robinson VK2BGR of Barraba

Our sincere condolences to the families and friends of these amateurs

Digital DX Modes

Rex Moncur - VK7MO

Dave, VK0MT, has completed his period at Macquarie Island with 2 metre, JT65b, EME contacts to W5UN, KB8RQ, DF7KF, RN6BN, HB9Q, KJ9I, N5BLZ and VK7MO using his small 2.3 WL yagi and 100 watts. On 2 metres meteor scatter using FSK441a, he completed with VK7MO, VK7JG, VK3KAI, VK3HZ and VK3FMD. Each of the VK3s who worked him went portable to gain the extra elevation to achieve these contacts at around 2000 km - well done to Peter, Dave and Charlie. The longest distance was to Charlie, VK3FMD, at 2122 km. Dave also worked Bob ZL3TY on meteor scatter for what is though to be the first ZL to VK0 contact on 2 m.

Welcome to Trevor, VK4AFL, and Wayne, VK4WS, in Brisbane and also Bill, VK4KHZ, at Glenden, west of Mackay, who are now operational on 2 metres FSK441. Trevor has worked into Hobart and Wayne has copied VK3s and VK7 and been copied by Peter, VK3KAI.

Tests have been conducted to compare FSK441a and FSK441b. The basis of the tests is that it is possible to construct a message "##" that when transmitted in FSK441b will also decode in FSK441a as "#SX". Pings can then be recorded and played back in both modes and the numbers of correct characters counted to compare the modes. The results indicate that on 2 metres there is very little between the two modes although FSK441a appears to have an advantage below 1000 kms and FSK441b is marginally in front for distances above 1000 km. Given that there is little difference between the modes it has been decided to continue present arrangement for activity sessions with FSK441a on Saturdays and FSK441b on Sundays.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

2 m and 70 cm FM DX

Leigh Rainbird - VK2KRR

A mixed bag of conditions for March, good in some areas but remaining poor for most others.

In a continuation of the good conditions experienced during the end of February, the first few days of March were quite good in the south east.

The 2nd of March saw a few FM DX signals about. Brian VK5UBC at Gawler had a good run working VK2KRR 5/5 and Ray VK3RW 5/7. Ray was using a Diamond vertical for the 710 km contact. Brian was able to get to a large number of interstate 2 m repeaters, which included Geelong, Mt Baw Baw, Yarrawonga, Wagga and a big trip to the Canberra Mt Ginini repeater at 920 km.

Following on the next morning 03/03, John VK5PO at Eden Valley was working the Canberra repeater at 884 km.

14/03 John VK3HJW reports working VK5UBC at Corny Point via the Otway Ranges repeater 147.275. John also notes that Brian later worked the Mt Barrow, Tasmania repeater 147.000 which would be over 1000 km for Brian, probably 400 km or so for John.

Beginning on 20/03 and ending around 22/03 an opening occurred to the VK6 south coast from the Adelaide area. Frank VK6DM at Albany worked VK5UBC at Gawler with rather weak signals 146.500 at 1919 km. Frank also managed to work some Adelaide area repeaters such as Houghton 146.850 and also Crafers 147.000 in the 1900 km area. Brian then worked Frank and also Bob VK6BE via the Albany repeater 146.725.

Up in north Queensland, Mike VK4MIK reports the bands have been rather quiet, only occasional openings into the Townsville repeater being heard from up near Cairns. On 22/03 Mike worked to the Mackay repeater at S6 signal strength, were he worked Felix VK4FUQ from Ingham, 525 km to the repeater for Mike. Mike worked as far as the Hodgson Range repeater 146.925 in the central highlands at 640 km to his south. Also to the Hayman Island repeater at 451 km. Mike was unable to raise anyone for a QSO on the latter two.

29/03, Hayden VK7HAY went on a trip to Mt Barrow from Hobart. Being a keen new operator, it was pleasing to see that Hayden took along his handheld rig and worked some DX right across the waters of Bass Strait to Victoria's Mt Baw Baw repeater on 147.225. This is around 400 km for Hayden and he was able to peak the signal up to 5/6. Luckily, Adrian VK3HEQ was out mobile and was able to respond to Hayden's calls via the repeater.

Please remember to send through any 2 and 70 FM DX reports to Leigh VK2KRR at vk2krr@bigpond.com

ar

Modifications to the KR400 rotator

By Barry White VK2AAB

I had the unfortunate experience of a book falling on one of the switches of my rotator control box, sending the rotator to one end and burning out the motor.

I rewound the motor, which was not all that hard to do.

However, once bitten twice shy. I decided to fit microswitches as limit switches to the rotator. I also now have my rotator controlled by my Pactor BBS's computer. This system sends the rotator to the counter clockwise end on a reset occurring and limit switches are essential in this type of unattended service.

Also if you use rotators to follow satellites then you should also have limit switches.

It is a quite straight forward job. Because the circuit is interrupted by the limit switches it is necessary to remove the starting capacitor from the control box and fit it into the rotator itself. It will fit just behind the terminal block.

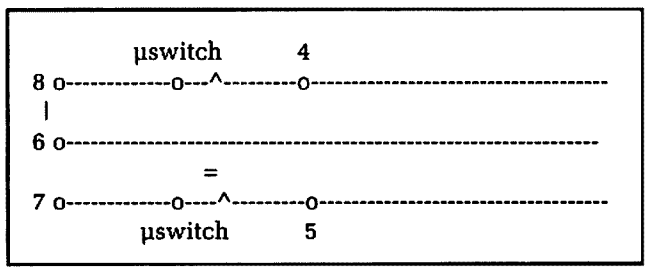
There are a number of preliminary steps you must take before opening the rotator and I can assure you it will save considerable time. Connect up the rotator on the bench and send it to due north. Measure the resistance between the arm of the potentiometer and each end. If it is not the same then move the rotator until it is the same. Then with a marking pen mark the sides of the rotator so that you can put it back together the same way. With the rotator upside down undo the bolts that hold the rotator together. Hold the rotator together and turn it over so that it is right side up.and you can now lower the ring holding the ball bearings. Watch out that you don't spill ball bearings everywhere. Be careful there is another set of ball bearings.

You can now remove the top of the housing.

You can now see as in the photograph where the lever which is the mechanical stop is located on top of the plate. If you look inside the top housing you will see that there is a part of the diecast that comes around and pushes the limit stop lever. This is hinged so that the rotator can get a full 360 degree rotation. The limit switches are operated by this lever.

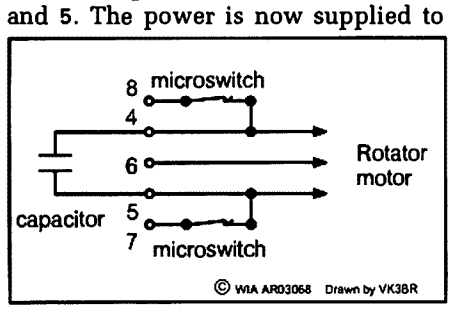
Note the ring gear just below the internal top plate. It has four blocks moulded into its casting. They are not the same size. One is larger than the others. This one fits into the top casing on the opposite side from the part of the top housing moulding that operates the limit lever. If you positioned the rotator correctly it should be alongside the limit lever. If for some reason it is not midway between the limit lever stops then lift the ring gear clear of the potentiometer gear and move it until it is midway between the stops. Replace the ring gear and check the potentiometer.

The microswitches I used had 100 gram operating force at the ends of their operating arms and it worked very satisfactorily for some years. They had sufficient force to push the limit lever out of the way when the motor was reversed. However recently I found the rotator would not turn in one direction. At first I thought it was a faulty microswitch, but when I got the rotator on the bench it worked perfectly. I opened the rotator and after a while it failed and I could see that the limit lever stayed against the switch. I removed a pair of springs from an AA battery holder and fitted them under the adjacent set screws. Make sure that the springs press on the lever itself and not the microswitch arm.

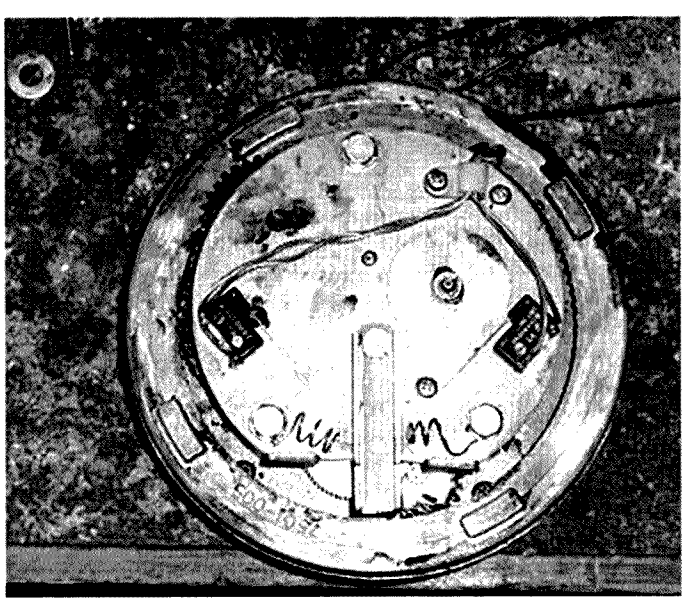


Microswitch wiring

The diagram shows the changes to the wiring. The capacitor is connected across the previously used teminals 4 and 5. The power is now supplied to

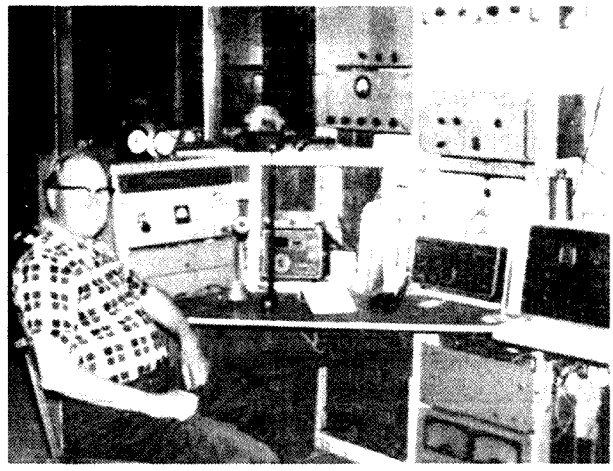


Rewiring of controls



Ring gear, limit stop lever, microswitch and additional spring positions

Roy Haynes VK3RU



Roy was born in Albert Park in 1916 and moved to Northcote where he attended Westgarth School. He enjoyed the outdoor life fishing and camping with his father and was also interested in radio from an early age. Roy left school during the depression and jobs were hard to find, but Roy always knew his path would be in radio and took any job that would lead in that direction. His first job at Footscray Meat Works packing kidneys didn't sound promising, but it lead to an electrical apprenticeship followed by many years of night school, an electrician's job with Northcote Council and finally joining the Post Master General (PMG) where he stayed until retirement. But life was not always indoors and radio. During his earlier days, Roy also enjoyed outdoor pursuits where he played golf, became a keen Albert Park sailor and enjoyed winter skiing at Mt Buller long before lifts were installed.

His radio career continued during wartime where he was involved in radar development at the PMG Research Laboratories. Post war, Roy remained with the PMG as a Broadcast Station inspector and finally, Officer in Charge of Radio Australia, Lyndhurst. Working at Lyndhurst became a multi skilled job not limited to broadcast transmitters, antennas and the Talking Clock machine. Roy found himself involved in sheep farming as the preferred means to manage grass at an appropriate height and a short venture into the drug world when Opium Poppies were found in the Lyndhurst Station garden.

Radio was always his passion and he was one of those fortunate people who worked and played in the field he loved. It is not clear when Roy first became licensed, however an Experimental Licence was awarded to him by the Post Master General during 1948 along with his callsign VK3RU.

Roy retired at 65 and spent much of his retirement in and around his radio shack where he was a great experimenter. His original station equipment was home brewed to a very high standard with antennas modelled on the spider webs and curtains at Lyndhurst. As commercial amateur gear became more readily available, some of the old was replaced with more modern equipment covering 160 m through to 70 cm. Even with this capability, Roy spent most of his time on 2 or 40 metres usually talking with his mates. Possibly one of Roy's proudest radio moments was receiving his award from NASA for involvement in early Apollo missions and his certificate was prominently displayed in his shack. Roy's health slowed during the early '90s following a stroke, but he still maintained regular 2 m contact with Bill VK3KBL, Bert VK3BH and Max VK3ZCW until very recently and he was an active member of their group luncheons.

Roy was a quiet, undemanding man who lived simply and loved his family and his radio.

David Williams Vk3KAB

Modifications to the KR400 rotator *continued*

terminals 7 & 8, which previously were unused. Terminal 6, the motor common is unchanged.

One normally closed contact of a microswitch is connected between terminal 4 & 8 and the other between 5 & 7.

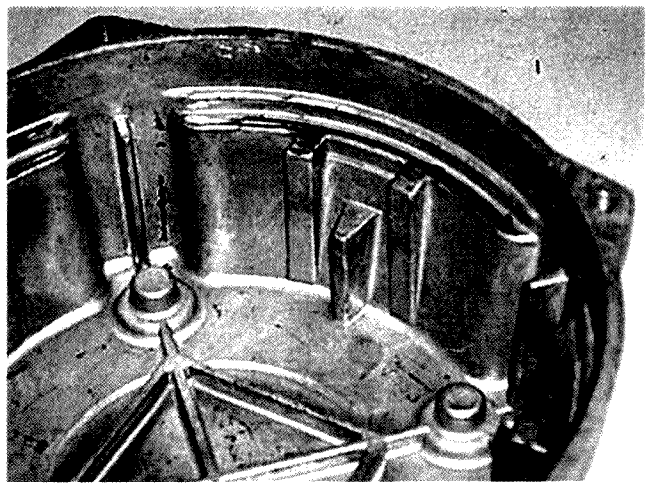
The controller now supplies power to terminals 7 & 8.

Adjust the arms of the microswitches so that they operate with at least 2 mm before the limit lever hits the stop. This should give reliable operation.

Reassemble in the reverse order but before you replace the top housing check that the potentiometer has not moved by ensuring that the resistance either side of the arm is the same. Likewise the large block on the ring gear should be centred between the limit lever stops.

After assembly operate the rotator and check its travel at each end and that it switches off reliably. You can hear the brake being dropped when the microswitch operates.

Since all this effort it has occurred to me that it should be possible to sense the increased current when the rotator hits the end stop. There are some problems of logic with doing it this way, mainly because of the indeterminate conditions after a power failure for different types of controller.



View under the top housing showing the rib which operates stop lever

ar

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

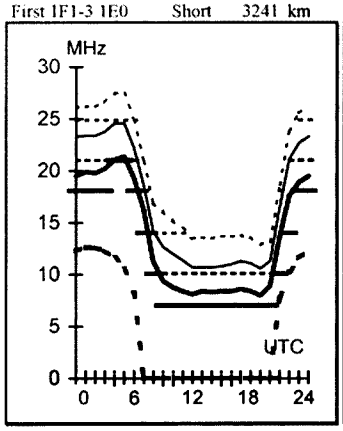
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

May 2005
T Index: 27

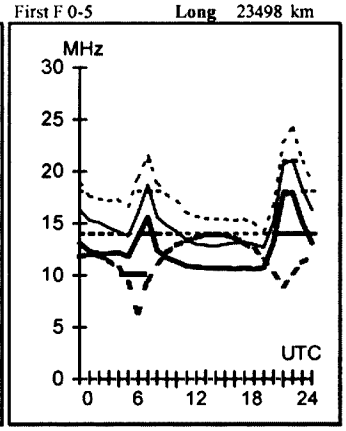
Legend

Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

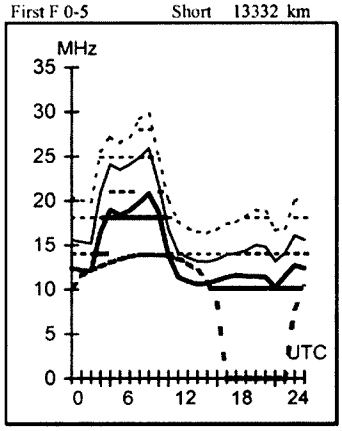
Adelaide-Auckland 104
First 1F1-3 1E0 Short 3241 km



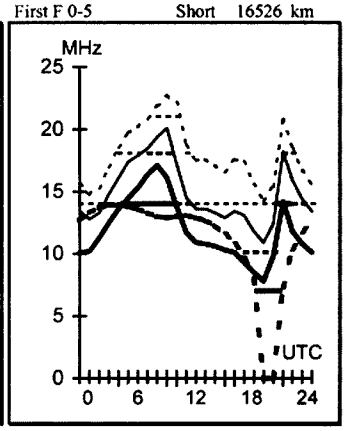
Brisbane-London 147
First F 0-5 Long 23498 km



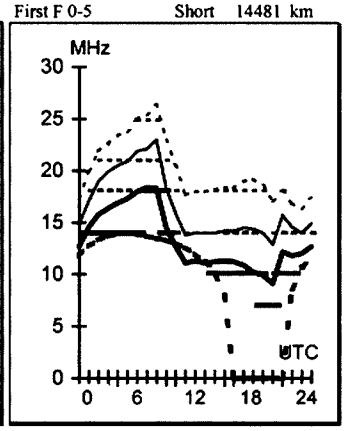
Adelaide-Cairo 288
First F 0-5 Short 13332 km



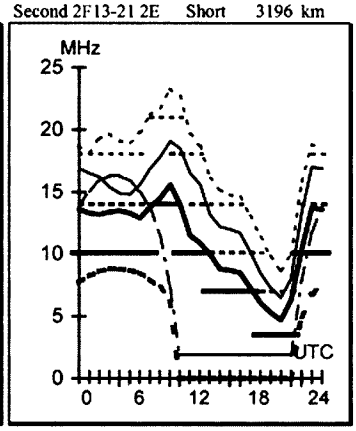
Brisbane-London 327
First F 0-5 Short 16526 km



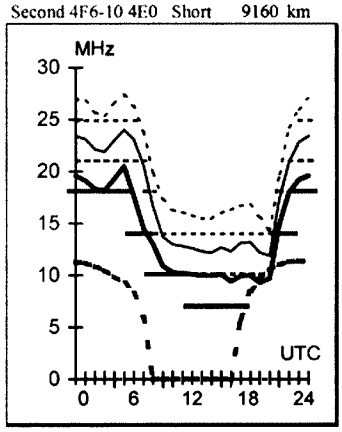
Canberra-Moscow 317
First F 0-5 Short 14481 km



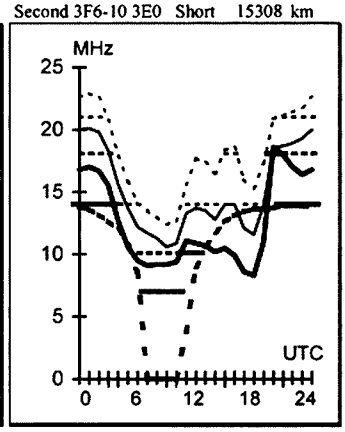
Darwin-Manila 340
Second 2F13-21 2E Short 3196 km



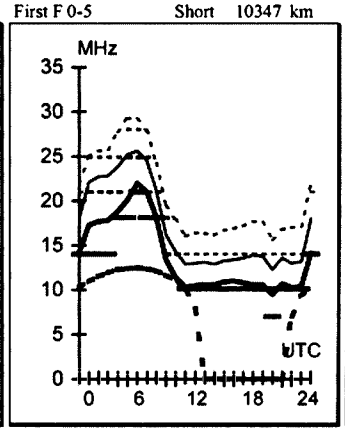
Adelaide-Honolulu 57
Second 4F6-10 4E0 Short 9160 km



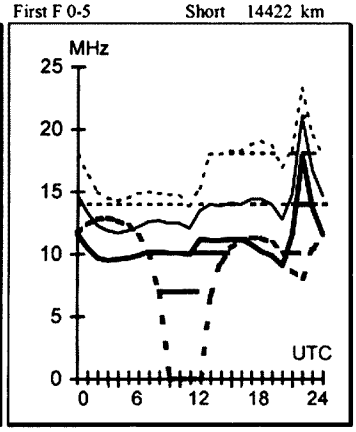
Brisbane-Ottawa 52
Second 3F6-10 3E0 Short 15308 km



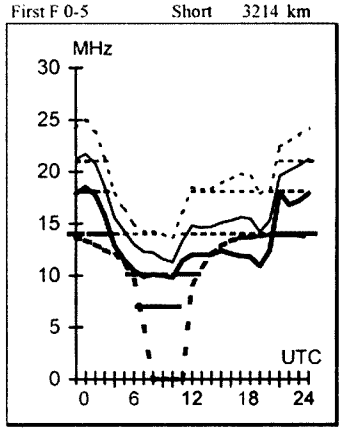
Canberra-New Delhi 303
First F 0-5 Short 10347 km



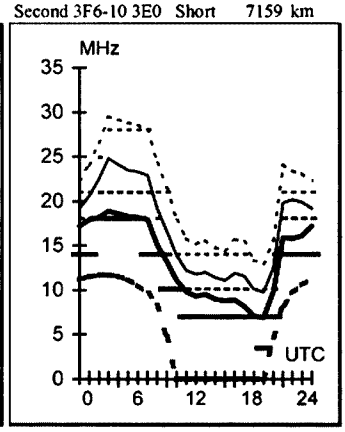
Darwin-Santigo 157
First F 0-5 Short 14422 km



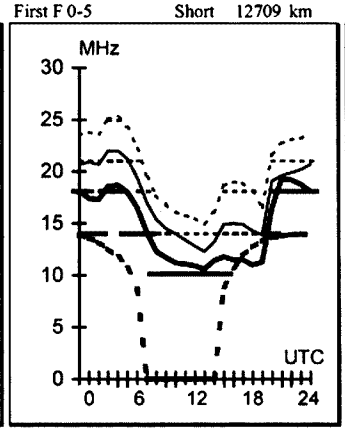
Adelaide-New York 114
First F 0-5 Short 3214 km



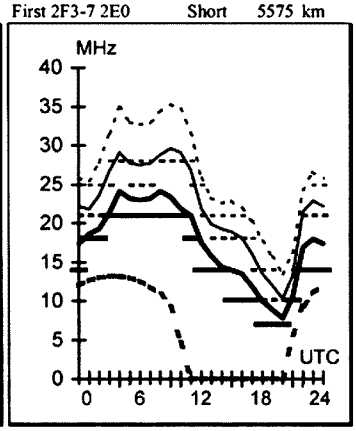
Brisbane-Tokyo 348
Second 3F6-10 3E0 Short 7159 km



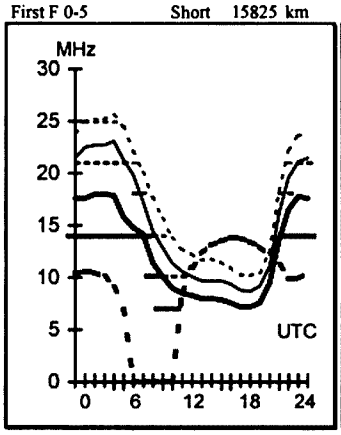
Canberra-Seattle 48
First F 0-5 Short 12709 km



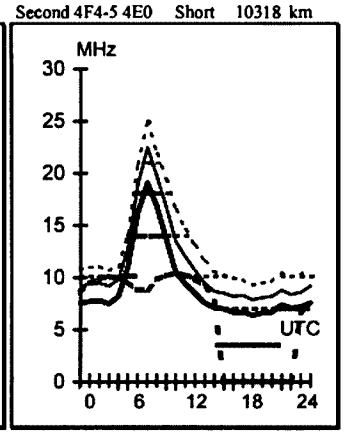
Darwin-Seoul 356
First 2F3-7 2E0 Short 5575 km



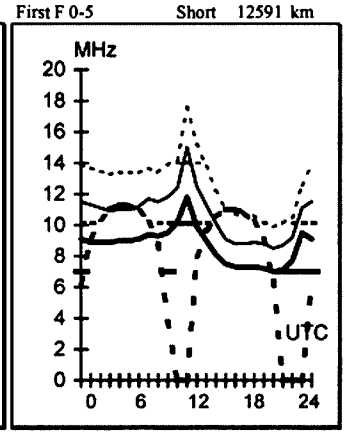
Hobart-Barbados 134
First F 0-5 Short 15825 km



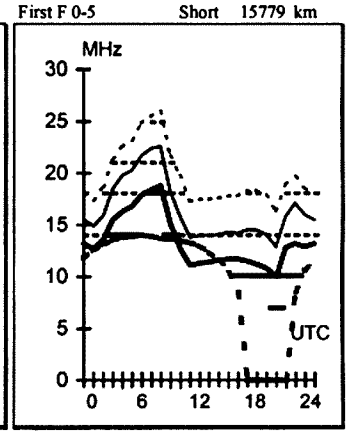
Melbourne-Capetown 222
Second 4F4-5 4E0 Short 10318 km



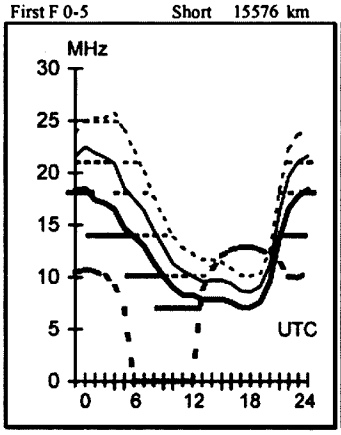
Perth-Buenos Aires 186
First F 0-5 Short 12591 km



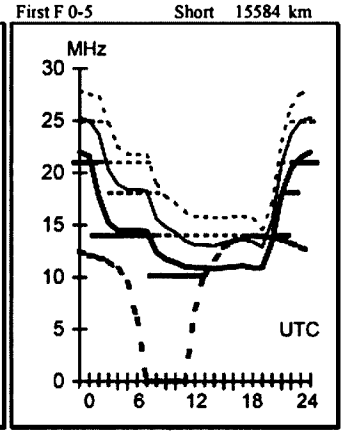
Sydney-Budapest 306
First F 0-5 Short 15779 km



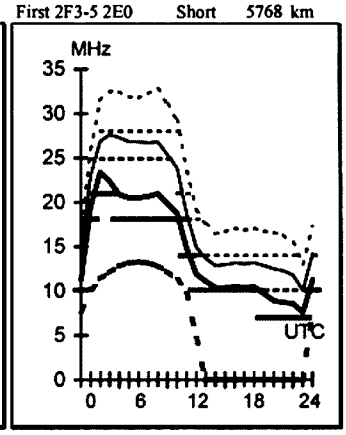
Hobart-Lima 133
First F 0-5 Short 15576 km



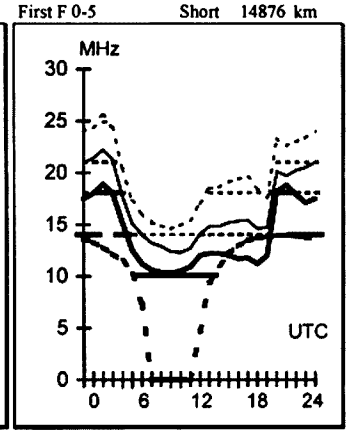
Melbourne-Miami 94
First F 0-5 Short 15584 km



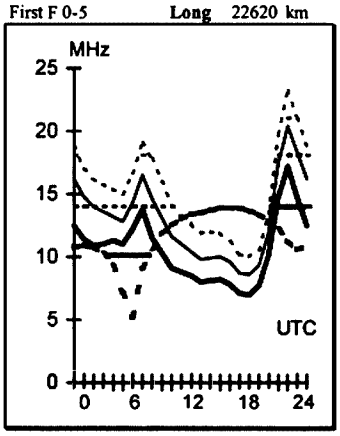
Perth-Columbo 312
First 2F3-5 2E0 Short 5768 km



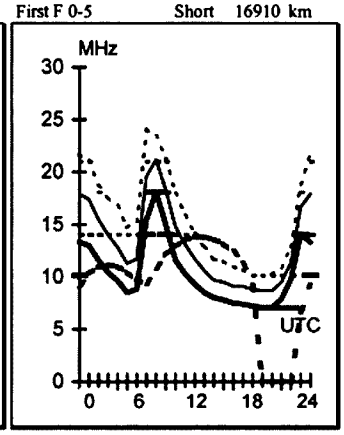
Sydney-Chicago 62
First F 0-5 Short 14876 km



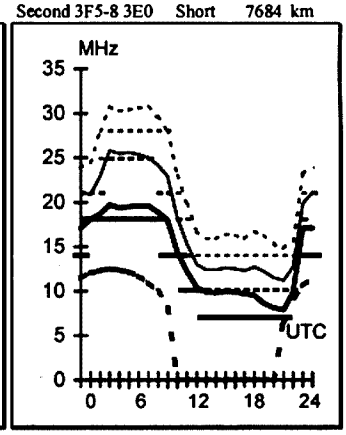
Hobart-London 123
First F 0-5 Long 22620 km



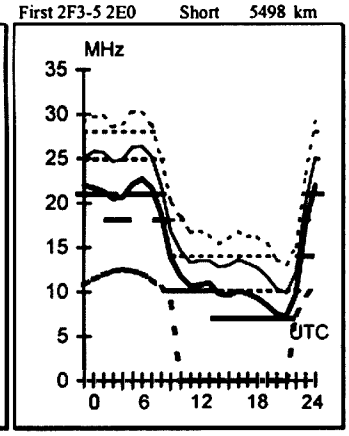
Melbourne-Senegal 219
First F 0-5 Short 16910 km



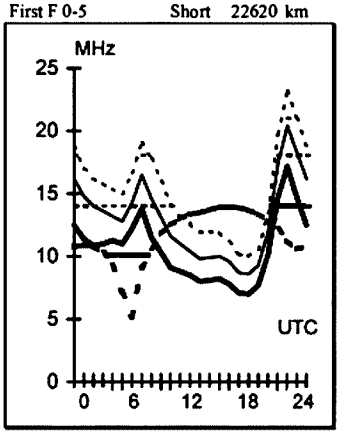
Perth-Osaka 17
Second 3F5-8 3E0 Short 7684 km



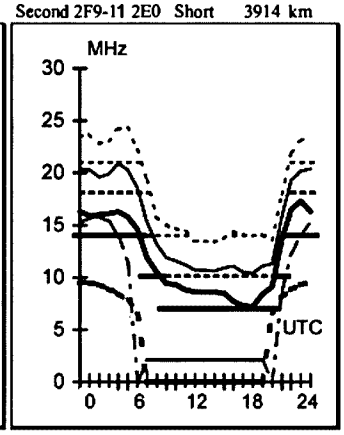
Sydney-Jakarta 294
First 2F3-5 2E0 Short 5498 km



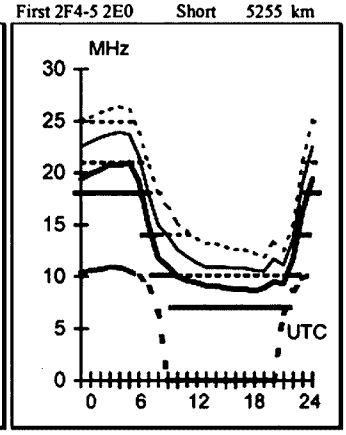
Hobart-London 123
First F 0-5 Short 22620 km



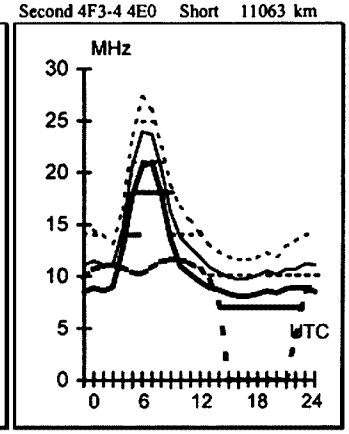
Melbourne-Suva 66
Second 2F9-11 2E0 Short 3914 km



Perth-Wellington 119
First 2F4-5 2E0 Short 5255 km



Sydney-Pretoria 230
Second 4F3-4 4E0 Short 11063 km



Hamads *classifieds* FREE

FOR SALE NSW

• **TS-830S transceiver** 160 m to 10 m, ex. cond., orig. packing, manual, workshop manual, mic., spare 6164B valves & driver valves. $450 +P&P. Yaesu **FC-902 Antenna Coupler** 160 m to 10 m. ex. Cond. $100 +P&P. Brian VK2MQ. Email oo091@hotmail.com. Phone 02 6947 1213.

• **Yaesu FT-212RH FM XCVR** $120. **Shure model** 444 microphone $50. **ICOM IC-22** XCVR 13 crystals plus **PacComm Tiny-2** packet module c/with 12v p/supply $100. George VK2OH, Phone 02 6554 9610

• **4 Mobile Helicals**, 10, 20, 40, 80 m, 2 spring mounts, 1 long 20 m helical, 2 gutter grips; $110 total. **Panasonic KX-P1180 Printer**, $10. 2 x **FM-828A**, $20 ea. 4 x **LDF4-50** female N connectors, new; $15 ea. 8 metres LDF5-50 coax, $20. 6.5 metres **LDF** 4-50 coax, $10. Roger Woodward, VK2DNX QTHR

WANTED VIC

• **Monitorscope** in good working order & condition. Prefer Yaesu YO-100 but YO-901 or Kenwoods considered also. Also again looking for a Kenwood SP-930 speaker. Damien VK3RX Phone 03 5427 3121 vk3rx@wia.org.au

FOR SALE SA

• **Radio magazines** 400 plus: ARs from 1987, ARAs from Issue 1 to 1995, Radio & Communications, $25 the lot to collect. John VK5CJP QTHR. Phone 08 8336 7519.

WANTED SA

• 1296 **transceiver**, Yaesu, Kenwood or other make(s) with 10 watt output, mobile. Being used for club project. Merv Phone 08 8346 7042 VK5MX QTHR.

• Could anyone help me with copy of **Yaesu FRG-7000 Communication Receiver instruction book**. Serial 24810 030046. All costs returned. Yuri VK5ZYS QTHR Phone 08 8445 8492.

• **FT-101E** in good order or similar transceiver using 6JS6C valves. Contact VK5BVJ. Phone 08 8723 1001 with price. QTHR Callbook.

• **1.-Electronics Australia magazines**, years 1996, 97, 98, 99, 2000, good condition. 2. **Wall poster of the Philips 20AX** in line gun self converging colour CRT. 3. **Copy of a circuit FM stereo decoder** using the 6AR8/6JH8 decoder valve. VK5ZST Phone 08 8520 2988

MISCELLANEOUS

• **The WIA QSL Collection requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

TRADE ADS

PSK-31, SSTV, RTTY SOUNDBOARD Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

RADIO SPECIALISTS sales and servicing. Buying radios. Shop: 243 Seacombe Road, South Brighton (Adelaide) 08 8298 3906

email:rfwizard@optusnet.com.au for prices.

NOTE:I do NOT import radios from the USA. Can you afford to write a radio off? VK5VK

About hamads....

- Hamads may be submitted by email or on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newunltd@bigpond.net.au* **Fax:** *03 9756 7031*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793*

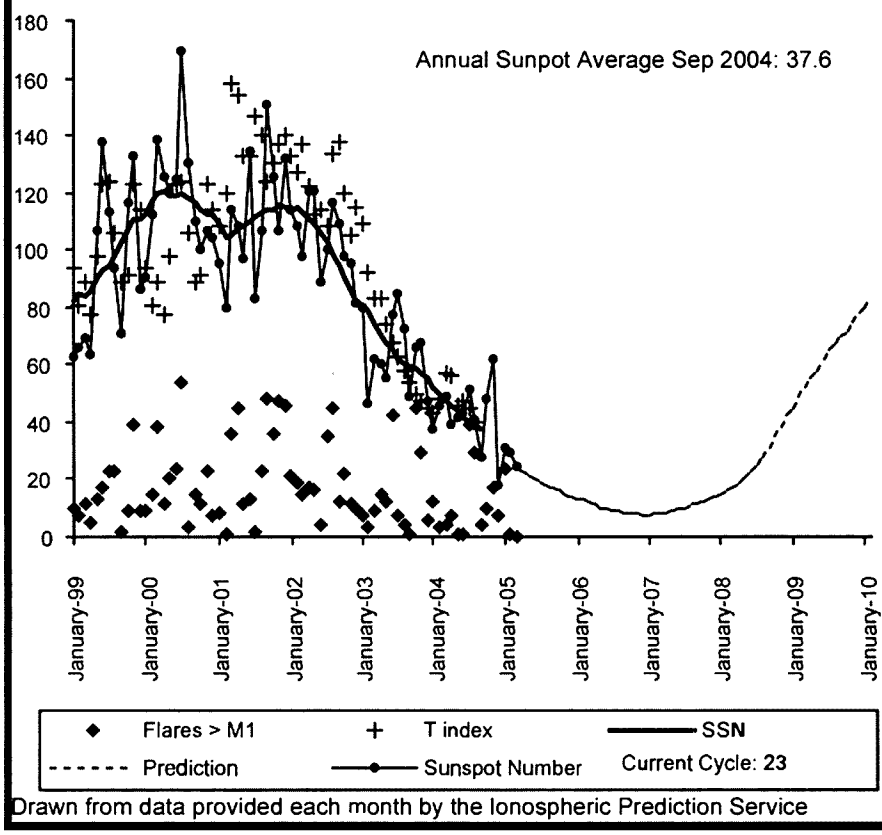
TRADE PRACTICES ACT
It is impossible for us to ensure that the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore, advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are strictly complied with.

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 box-holder or seller of the goods.

Sunspot Numbers

Monthy Sunspot Average Mar 2005: 24.8

Annual Sunpot Average Sep 2004: 37.6



Drawn from data provided each month by the Ionospheric Prediction Service

ADVERTISERS INDEX

AEI	20	Icom	OBC
Andrews	9	Ozgear	8
Benelec	IFC	TTS	28
Bushcomm	29	54s	55
Com-an-tena	16	VK Discounts	54
TET-Emtron	23	Winlink	17
G & C	17	www.vk3ajj.com	55

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: **★ $ 75 for full members (F grade), ★ $ 70 for pensioners and students (G and S grade), and ★ $ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

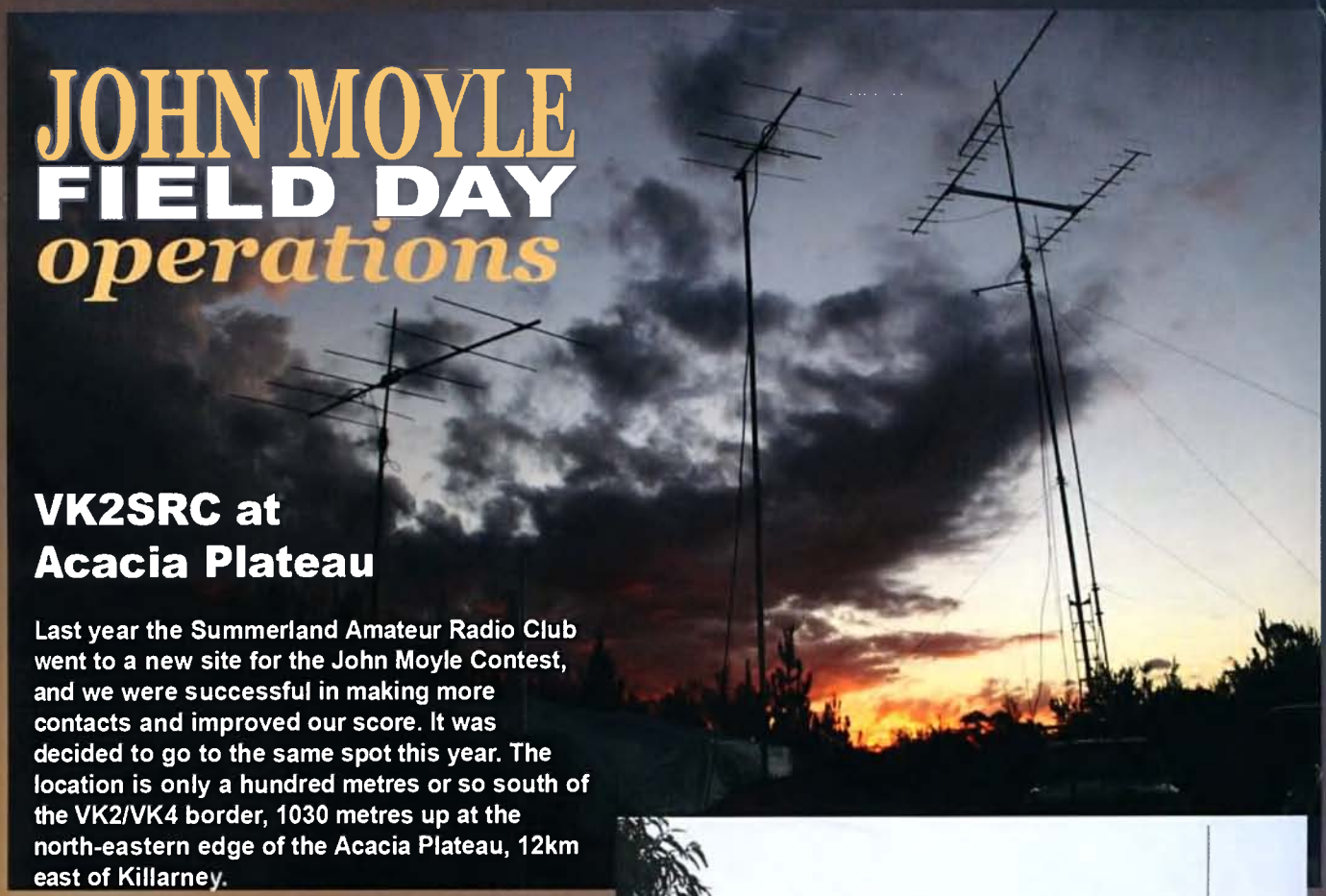
National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt VK4KF Ken Fuller	Phone 07 3221 9377 qac@wia.org.au ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK1WIA Sunday 9.0am via WIA network
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

JOHN MOYLE FIELD DAY *operations*



VK2SRC at Acacia Plateau

Last year the Summerland Amateur Radio Club went to a new site for the John Moyle Contest, and we were successful in making more contacts and improved our score. It was decided to go to the same spot this year. The location is only a hundred metres or so south of the VK2/VK4 border, 1030 metres up at the north-eastern edge of the Acacia Plateau, 12km east of Killarney.

On our previous visit, we could see across to some of the spectacular rocky peaks around Mt.Barney and to Mt.Superbus, the highest peak in northeast VK2. This time, we found the site hemmed in by thick pines and hakeas, which had tripled in height. Fortunately we had the benefit of tall portable towers to get the antennas in the clear.

more details in News from...

Elizabeth ARC John Moyle Field Day 2005

Four members of the EARC decided to operate independently in the John Moyle Field Day, but to operate from two sites Wirra Picnic Ground and Hope Hill. These sites are about 8 km apart. Hope Hill is a good VHF/UHF site and Wirra Picnic Ground has plenty of flat area for HF wire aerials.

Right: Colwyn VK5UE's "Beetle with antenna"

ICOM'S GREAT CHAMPIONS

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706.

Now includes 70cm @ 20W and 50W on 2m Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch Detachable Front Panel (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied:HM133.

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495 KHz - 1 GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

ICOM

PH416_AM02

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

find your nearest ICOM dealer at

www.icom.net.au or (03) 9387 0666

Volume 73 No 6
June 2005

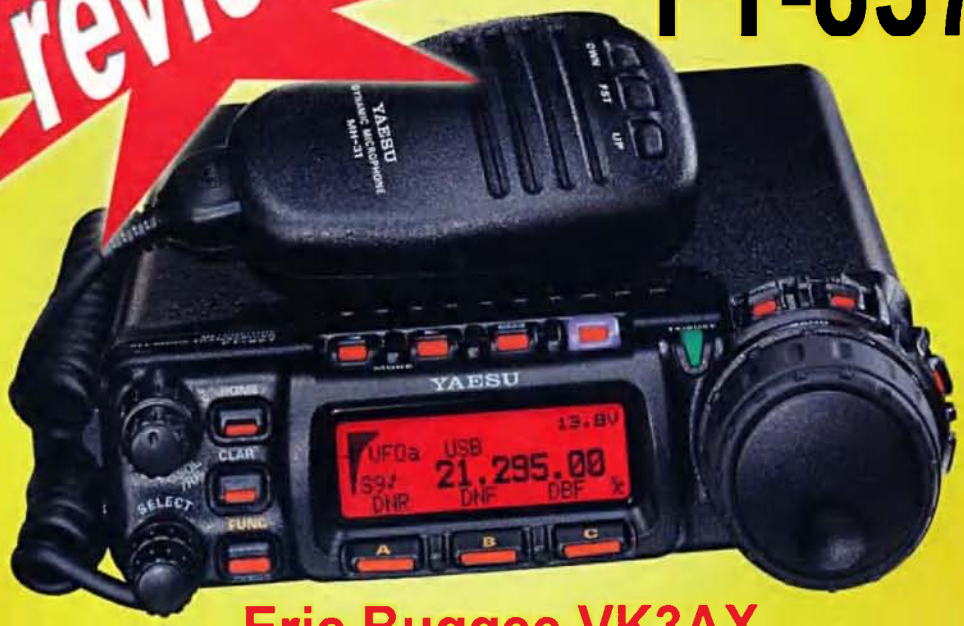
Amateur Radio

$6.50
incl GST

The magazine for AUSTRALIAN radio amateurs

review

Yaesu FT-857D



Eric Buggee VK3AX

tests the most compact transceiver of its type and finds it exceeds expectations

Part one of

VHF and microwave propagation characteristics of ducts

Andrew L Martin VK3KAQ

Part 3 of

Unravelling the mysteries of connecting radios to antennas

Brian Clarke VK2GCE

Using the HP 8405A vector voltmeter

Richard Sawday VK5ZLR

9 770002 685062 06

BENELEC

YAESU

PACKING A POWERFUL PUNCH IN A SMALL PACKAGE

FT-857D

ULTRA-COMPACT HF/VHF/UHF 100 W ALL-MODE TRANCEIVER

Features

- Remote Mountable Head
- All Mode SSB/CW/AM/FM/ FM-W/Digital
- Ultra Compact (155W x 55H x 233D mm)
- Hi Power (100W 6m, 50W 2m, 20W 70cm)
- Built-in VOX, Speech Processor & DSP2
- 200 memories plus more
- Auto-tune Antennas Output

Accessories Options

VHF/UHF Antenna
Base/Counterpoise kit for ATAS-120
ATBK-100

Collins SSB Filter
(2.3kHz/4.7kHz: -6dB/-66dB
YF-122S

Collins CW Filter
(300Hz/1kHz: -6dB/-60dB)
YF-122CN

0.5ppm High-Stability
Reference Oscillator
YH-77STA

Collins CW Filter
(500Hz/2kHz: -6dB/-60dB)
YF-122C

Deluxe
Ultra-High Quality
Desktop Microphone
MD-200A8X

Motor Drive
Auto-Tuning Antenna System
ATAS-120

External Automatic Antenna Tuner
FC-30 & FC-40

DTMF Microphone
MH-36E8J

Remote Control DTMF Microphone
MH-59A8J

Lightweight Stereo Headphone
YH-77STA

CAT Interface Cable
CT-62

Packet Cable
CT-39A

Band Data Cable
CT-58

Separation Kit
YSK-857

Benelec Approved Amateur Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060
lee.andrews1@bigpond.com
Newcastle Pro Sound & Communications
Tel: 02 4965 6899
sales@newcastleprosound.com.au
Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
vk3my@bigpond.net.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

Ozhelp Services
Tel: 07 3273 7263
sales@ozgear.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8285 2400
brenton@posnav.com.au

Radio Specialists
Tel: 08 8298 3906
rfwizard@optus.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 6
June 2005

The Journal of the Wireless Institute of Australia
ISSN 0002-6859

Editorial

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Amateur Radio: Reports to WIA 2005 Annual General Meeting 26
Ted Thrift VK2ARA, Colwyn Low VK5UE

Is the Remembrance Day Contest dying? (Opinion) 28
Vince Henderson VK7VH

TECHNICAL

VHF and microwave propagation characteristics of ducts, Part 1 5
Andrew L Martin, VK3KAQ

Using the HP 8405A vector voltmeter 12
Richard Sawday VK5ZLR

Unravelling the mysteries of connecting radios to antennas ~ Part 3 14
Brian Clarke, VK2GCE

VI5PN operation – a great success 17
Peter Forbes VK3QI

A simple wind direction indicator (Technical abstracts) 19
Peter Gibson VK3AZL

Mounting Yagis (Technical abstracts) 20
Peter Gibson VK3AZL

The ICOM IC-730 HF transceiver (Know your second-hand equipment) 21
Ron Fisher VK3OM

Equipment review: Yaesu FT-857D, all mode, HF, VHF, UHF mobile transceiver 22
Eric Buggee VK3AX, Ron Fisher VK3OM

Comment from Yaesu distributor on the review 24
David Benohoam, Benelec

COLUMNS

ALARA 36
AMSAT 37
Awards 40
Beyond our shores 39
Contests 41
Directory 56
DX~ News & Views 45
Editorial comment 2
Equipment review 22
Hamads 54
HF predictions 52
Know your second-hand equipment 21
Opinion 28
Over to you 44
Silent keys 30, 36
Spotlight on SWLing 13
Technical abstracts 19
News from...
VK2 30
VK4 31
VK5 32
VK6 32
VK7 34
VHF/UHF – an expanding world 48
WIA comment 3
WIA news 4

Our Cover this month

***Amateur Radio* magazine will be presenting a selection of reviews of both new transceivers and ancillary equipment on a regular basis. Eric Buggee VK3AX will be doing the technical tests. His first review is of the Yaesu FT-857D transceiver.**

See page 22 for the results of Eric VK3AX's test.

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

June Fox/Judith Oliver Office Coordinator
Emma Trebilco Examinations Officer
Brenda Edmonds Office Assistant

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
Assistant Treasurer	Bruce Bathols	VK3UV

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	Glenn Dunstan	VK4DU
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glenn Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

One year old and going strong

The national WIA has had its first birthday and seems to be healthy.

The basic organisation is operating, but like all dynamic systems there are things still to be fine tuned, things that now need to be done in different ways and completely new things that the new structure and changing times require. Some reports from the AGM will appear in AR but others will only appear on the WIA web site. The financial reports have been distributed as an enclosure with AR. I am sure if you do not have access to the web then copies will be available from the WIA office or a friend can print you a copy from the web site. Further the President's News and Comments columns are dealing with the business of both the AGM and the Open Forum held after the AGM.

For those who like contests we are definitely in the VK contest season. Harry Angel Sprint, VK-trans Tasman contests, Jack Files Sprint, RD and ALARA should have keen contesters looking forward to a rest in September. I did read in CQ an article from an ardent Contest operator who had gone to considerable lengths to improve his health and fitness so that he was in peak condition for all contests and not nodding off at 4 am! Who said amateur radio was a sedentary hobby. WICEN is active in many states now supporting sporting events. The Australian Rally Championships have rounds in most states. The VK7 notes cover Targa Tasmania and VK5 is getting ready for Rally SA in early July.

I am still sorting out my aerials with VK5JST's aerial analyser. When you can look at frequency, resistance and impedance together you learn a lot about the system and wonder why it worked at all in some cases. I have also sorted out my mistakes with the low power meter from June 2001 QST. When you can sense nW, yes nanowatts, screening is important. I also learnt something about making PC board boxes and where to source brass nuts locally. I am quite pleased with the result. On the way I had a refresher course in power measurement units and design of attenuators. Putting together the calibration set up with the FT101, the Bird Thruline wattmeter, the CRO, the dummy loads and my HF power meter, till now uncalibrated, took some time and a lot of bench space. More learning.

BPL is still on the amateur agenda but overseas there are cases of BPL experiments being terminated due to the interference they caused. We should all be thankful that we have a few teams of amateurs who are prepared to monitor the VK tests of BPL. I think the next BPL tests are in VK7 where the amateurs are ready. Good hunting.

New licences are being actively pursued by the WIA with the ACA, we are getting action on the amateur radio review in two parts and the new licences are in the first part. See the WIA web site for more info.

Please note that we have all the information on the revamped WIA DXCC awards in this issue. Turn to the inside back cover to see the certificates in all their glory. Mal Johnson VK6LC has done a great job. Thanks Mal.

73 Colwyn VK5UE

Michael Owen VK3KI

The first year of a national WIA

With the first anniversary of the adoption of the national Constitution on the 16th May, it is appropriate to look back at this first year of our restructured WIA.

In the last twelve months there were some 48 members who became silent keys, but there were three who were particularly significant for the WIA.

Last October we lost Henry Andersson, VK8HA, national Intruder Watch Coordinator until shortly before his death, and an Honorary Life member of the national WIA.

In January we lost Peter Naish, VK2BPN, WIA secretary, a former Federal President and Chairman of Directors of IARU Region 3.

In April we lost Ron Smith, VK4AGS, national Education Coordinator.

June Fox will retire shortly. Judith Oliver, who has joined the WIA to take over June's role, is currently working closely with June and Emma Trebilco to understand our organisation.

The office continues to manage the membership applications and renewals, and from that the mailing lists for AR as well as managing the WIA Exam System and the very many other activities associated with the WIA.

The restructure of the WIA has led to many new responsibilities, and will continue to do so as we establish new procedures, and address new tasks, for example, procedures to deal with the new QSL obligations.

We are now about to trial new membership software, so that we can have access to information more flexibly, and various accounting functions can be carried out automatically. We are also installing new and current accounting software, which will better interface with the membership management software. All this has to be completed quickly so that we can start our new membership renewal cycle in June, with the new Family Membership and a 5-year subscription.

We have purchased two new PCs and a new photocopier/printer.

Funds have been set aside to allow some office refurbishment, which is now taking place.

Over the last year we have repeatedly stressed the importance of the clubs to the WIA, and nearly 60 clubs are now Affiliated Clubs of the WIA.

In the past year we have visited as many clubs as possible.

We have sought to identify the needs of the clubs at the various meetings we have attended, and are now working to meet those needs.

During the year the WIA became a beneficiary under the will of the late Henry Andersson, VK8HA. He left his property at Humpty Doo to the WIA, and we successfully sold it only the other day.

Since July 2004 the former Q-News team led by Graham Kemp, VK4BB has been the national WIANews team, providing a totally professional national weekly broadcast, rebroadcast right across Australia.

In the past year we have really enhanced and up dated the WIA website on an almost daily basis.

We have worked closely with the AR team.

Through the WIA website, broadcasts and AR, the WIA Board has sought to ensure that as much information as possible about what the WIA is doing is made available as quickly as possible.

Each of us who accepted a role on the board of the WIA after the adoption of the new Constitution just one year ago was very aware of the challenges that we faced

Of course, representation is the fundamental responsibility of the WIA.

In August last we sought changes to the Australian Spectrum Plan, and the 3776-3800 kHz "DX window" was added to the Plan, and the band 1825-1875 kHz was allocated primary status.

Also in August 2004 the WIA also made submissions that were ultimately successful in relation to the 5.6 GHz band.

The WIA is represented on the Preparatory Groups already working on the next major ITU conference, the World Radiocommunications Conference scheduled for 2007, with several matters directly affecting the amateur service. Australia now proposes a table entry, rather than a footnote, to allocate the band 135.7 – 137.8 kHz to the amateur service on a secondary basis.

We have made submission to the ACA in respect of the allocation of spot frequencies around 5MHz, as in the USA among others. These submissions have now been rejected, and the WIA is now preparing a response.

The WIA has proposed a new and we believe better way of examining candidates for amateur qualification, accrediting and registering assessors after they have completed a course conducted by a Registered Training Organisation.

The WIA has conveyed to the ACA its considerable concern at the suggestion that the new licence structure, including the Foundation Licence, originally promised for early this year, will not come into force before the third quarter of this year, and has suggested separating the new licences from other proposed changes to the amateur LCD, with the new licences to come into effect by 30 June this year.

During the first 12 months of the national WIA, BPL interference has emerged as a major and global issue affecting amateur radio and other users of the HF spectrum. The WIA is continuing to advance informed and reasoned opposition to that threat, and will be responding to the ACA's discussion paper on BPL.

The WIA continues to be represented on the relevant Standards Australia committees.

We have fulfilled our promise to provide a QSL service for WIA members at no cost, using the existing QSL structures.

The Board at its last meeting considered

continued on page 18

WIA news

Open Forum

Following the formal Annual General Meeting of the WIA at the Italo Australian Club in Canberra on 7 May 2005, the first Open Forum was held.

Reports were presented on behalf of the Board by the President, and covering ITU matters, BPL, Awards, Contests, Standards, the Technical Advisory Committee, WICEN, the Victorian Advisory Committee and AR.

There was discussion over a very wide range of topics, not only those raised by the reports but including such matters as marketing, multiple call signs and two letter call signs, a possible Code of Practice for amateurs and on air behaviour.

WIA Secretary, Chris Jones, VK2ZDD concluded the meeting by saying that he thought it had been a success, as the WIA had not been politicking but trying to make amateur radio work better.

VK3LC elected WIA Life Member

Alf Chandler, VK3LC, who will be 100 on June 1 was elected an Honorary Life Member of the WIA at the Annual General Meeting on 7 May 2005.

Alf, who has been a member of the Publications Committee and Intruder Watch Coordinator was proposed to the WIA Board by Amateur Radio Victoria. The Board agreed, and, as required by the Constitution, nominated Alf to the AGM, which unanimously approved the nomination.

WIA President, Michael Owen, VK3KI will present his Honorary Life Membership to Alf at a special function to be held in his honour by the Moorabbin and District Amateur Radio Club on 31 May.

Delay in new licences

On 4 May 2005 WIA President, Michael Owen, VK3KI, announced that the WIA had been advised by the ACA as follows:

"In the Media Release No. 41 dated 31 May 2004, the Australian Communications Authority (ACA) indicated that it expected the new arrangements to come into force early in 2005. However, the Outcomes of the Review are now not able to be introduced until the third quarter of 2005. The ACA will provide further advice on this matter as soon as a date for the introduction becomes clear."

"As the WIA approaches the end of this first year as a national body, this news of further delay in the introduction of the restructure of the amateur service in this country, and particularly the introduction of the Foundation Licence, is very disappointing."

At the Open Forum following the Annual General Meeting a resolution was unanimously passed expressing concern at the further delay, accepting that some issues raised in the Outcomes could be delayed, but requesting the introduction of all new licence classes by 30 June 2005.

The WIA President has written to the Acting Chair of the Australian Communications Authority conveying the WIA's serious concern, and requesting the introduction of the new licences by 30 June 2005.

GA Taylor Medallion awarded to VK4BB

During the 1980s the then Federal Council developed a special award to mark extraordinary service to the WIA, and a medal of intrinsic value was created by the Western Australian Division, the GA Taylor Medallion.

The reason for its title is inscribed on the wooden box holding the medallion in the following words:

"Major George Augustus Taylor was the founding Chairman of the Wireless Institute of New South Wales in 1910, out of which grew today's Wireless Institute of Australia. He was a pioneer in many ways; granted one of the first transmitting licences under the 1905 wireless telegraphy act (prior to 1908); he was among the first ten wireless experimenters to have been licensed by the PMG Department (1909); demonstrated that pictures could be sent by wireless (1910); transmitting the first military wireless signals in Australia (1911); conducted the first wireless communication between moving trains (1911); was the first to fire a gun by wireless (1913)"

Since its introduction, only 5 medals have been awarded.

The WIA Board reviewed the rules for the various awards at its meeting in April, including the GA Taylor Medallion, and decided to award it to Graham Kemp, VK4BB.

At the start of the Open Forum WIA President, Michael Owen, VK3KI, presented a very surprised Graham with the medallion.

He pointed out that Graham had brought the national WIA right across Australia since July last year, with his WIA News team presenting the VK1WIA broadcasts.

"The only criticism I have heard of the broadcasts is that they are too professional", said Michael.

Ron Wilkinson Achievement Award presented to VK1ZKM

The Ron Wilkinson Achievement Award was created in the mid 70s by the generous gift of Mary Wilkinson, the widow of Ron Wilkinson, who gave a sum of money to the WIA to perpetuate the memory of Ron, to provide a certificate and $200 to be awarded annually to mark exceptional service to amateur radio. It was first awarded in 1977 to Wally Green, VK6WG for the 1296 MHz record breaking contact, and in the following year to Alf Chandler, VK3LC, for his work in coordination Intruder Watch Coordination.

At the Open Forum WIA President Michael Owen, VK3KI announced that the Board had decided to award the 2005 Ron Wilkinson Achievement Award to Keith Malcolm, VK1ZKM, a professional communications engineer, who represented the WIA on a number of important committees, including interference and in preparation for 2007 ITU World Radiocommunications Conference. However, the award was made to particularly note Keith's contribution as a member of the Australian Delegation representing the amateur service nominated by the WIA for the four weeks of WRC 03.

Judith Oliver joins the WIA

WIA President announced at the Open Forum following the WIA Annual, General Meeting in Canberra that Judith Oliver, with a background of teaching and charitable/voluntary organisations had joined the WIA to take over the role of June Fox, the cheerful voice of the WIA for nearly 18 years, who is retiring.

ar

VHF and microwave propagation characteristics of ducts

Part 1

Andrew L Martin, VK3KAQ

Observations from many years of amateur radio operations together with commercial microwave propagation studies are used to illustrate the nature of the VHF propagation in ducts. Recently developed formulae for characterizing VHF and microwave propagation in ducts are used and modified to reconcile the observations with theory. Measurements from a high resolution SODAR (SOund Detecting And Ranging) are used to show the complex structure and characteristics of elevated ducts. The ducts are shown to have very strong temperature gradients and to form in substantially the same range over long periods. The ducts are very stable in the vertical plane and dissipate during the day. Equations and diagrams are used to illustrate how refraction enables propagation to occur in ducts and how signals enter and leave a duct. The nature of VHF propagation via ducts is illustrated using basic ray diagrams.

The first direct association of beyond line-of-sight propagation of VHF signals with meteorological conditions was made by Ross Hull in 1934 [1]. Although Marconi had been able to send VHF signals beyond line-of-sight to a distance of 258 km in 1933, he had not made the association with meteorological conditions although it was evident that such propagation could not be explained by diffraction [2,3]. Since Ross Hull published his work there have been many experiments conducted in many countries to measure the VHF and microwave propagation characteristics associated with various meteorological conditions including ducts. Work on the long distance propagation of short wavelength radar signals via ducts was greatly advanced during the Second World War and is published in [4]. Since 1950, many experiments have also been conducted on line-of-sight microwave telecommunications links by organizations such as Telstra, AT&T, British Telecom and Telia (Sweden) to determine how these links operate in the presence of ducts. The author has been involved in some of these microwave field experiments since 1982.

After about 1950, radio amateurs also began to conduct regular propagation experiments at VHF frequencies. An excellent review of some of this work is given by Howse [5].

From the short distance microwave propagation work conducted and extensive amateur observations it was evident to the author that many of the results could not be fully explained by the current theories of duct propagation and that a new approach was required. The development of some new concepts of VHF propagation via ducts reported here is an attempt to reconcile the observed results obtained from over 40 years of observations and measurements of VHF and microwave propagation in the lower atmosphere.

The amateur observations were started by the author in 1962, with observations

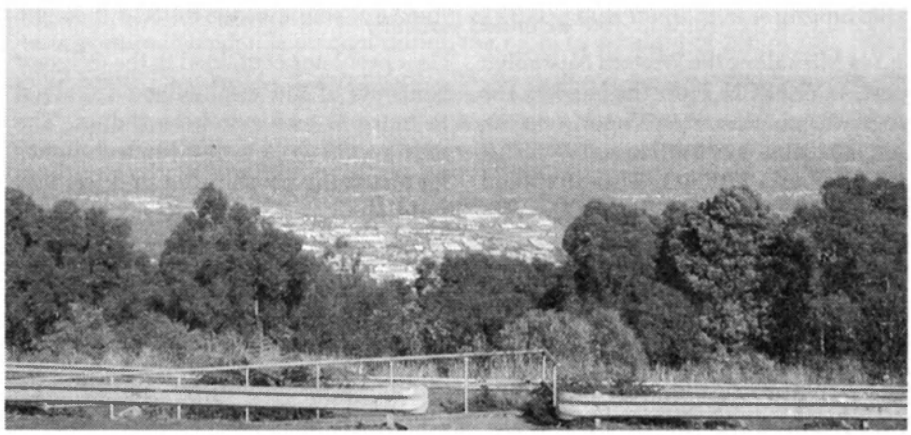


Figure 1. 620 m duct formed by subsidence in a high-pressure viewed from Mt Dandenong Victoria, 0Z 21 Dec 2002. In the original photo it is possible to see the slight wavy top of the duct that is most likely caused by internal gravity waves and wind shear induced instability.

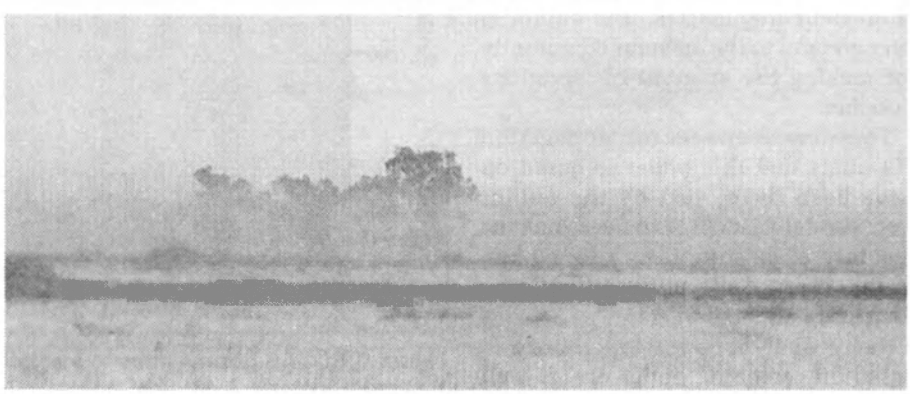


Figure 2. Surface duct formed due to radiation cooling over land, 6 am local time.

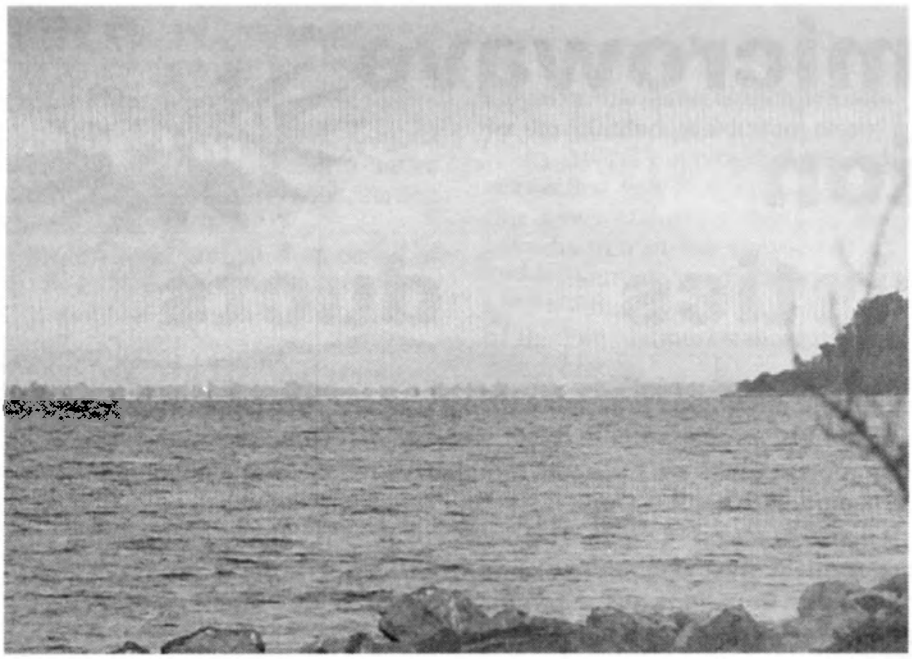


Figure 3. Evaporative duct over water where the distant shore line appears to be extended vertically.

on 144 MHz along the Western Australian coast, as VK6ZCN. From the late 70s, the work was continued in Victoria on 50, 144, 432 and 1296 MHz as VK3YLR and later as VK3KAQ. This involved many VHF contacts to VK7, VK5, VK6 and ZL together with a great many observations from other amateurs such as those reported by Howse [5]. From the early 1980s, the author worked at the Telecom Research Laboratories on microwave propagation and developing line-of-sight system design processes. Many papers were published about this work and several of the ideas developed in these papers were the direct result of observations of propagation behaviour at amateur frequencies. The author is very grateful to the amateur community for making the amateur observations possible.

The new concepts of propagation via ducts that this paper is based on have been developed by the author over several years [6,7] to overcome the inability of existing theory to explain all the observed effects, in particular the duct entry and exit effects.

Early duct propagation theory is based on geometric optics and is well summarised in [3]. This theory is unable to offer a complete explanation of all the observed duct propagation effects, in particular the widely observed frequency dependent effects. In his review of the mechanisms involved in duct propagation Howse [5] also found clear problems contained in the different concepts of the mechanisms involved in entry to and exit from a duct. The most recent work to develop techniques for analyzing propagation in ducts was published in 2004 by Isaakidis and Xenos [8]. This work used finite element methods to solve the parabolic equations used to describe propagation in a duct. It successfully describes the propagation in a surface duct but does not address the issue of propagation in elevated ducts or the problem of the radio wave entry or exit from a duct.

There are many widely held views about the nature of ducts, some of these views are based on opinion, some on science and some on hearsay. This paper demonstrates that:

- Elevated ducts DO NOT fall to become surface ducts.
- Surface ducts DO NOT rise to become elevated ducts.
- Ducts DO NOT act as a wave-guide (from geometric optics theory of duct propagation).
- Ducts ARE frequency dependent.
- Coupling into the duct is along its WHOLE LENGTH.
- The antennas DO NOT have to be in the duct but it helps.
- Evaporative ducts occur ONLY over water.
- Radiation cooling ducts occur ONLY over land.

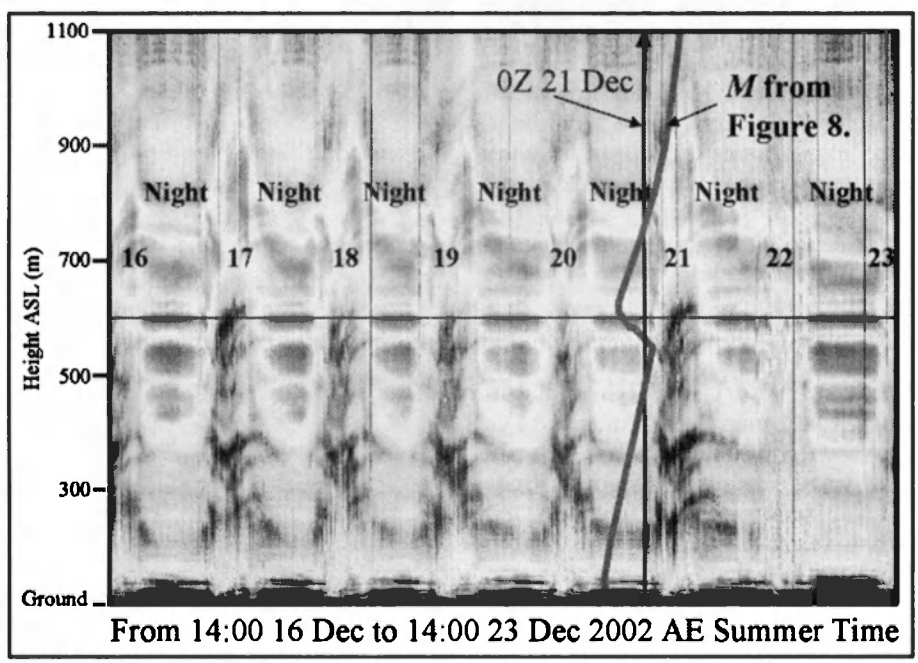


Figure 4. SODAR observations to a height of 1100 m ASL over seven days, made at Mulgrave, Victoria, Australia, December 2002. Red areas are highest signal return and blue areas are lowest signal return. A strong elevated duct is evident at 600 m for seven nights where the amplitude of the return SODAR signal is highest. The corresponding M profile from Figure 8 for 0Z on 21 Dec 2002 is also shown. The calculated M profile corresponds well with the highest SODAR signal level. The elevated duct clearly forms during the night and breaks up during the day due to the effects of rising plumes from ground heating. Ground level is at 100 m. 3895 measurements with 2 m vertical resolution. (We could not print the full colour picture of Figure 4 and 5 . The editor can email colour images on request.)

There are of course many more ideas that could be added but do not pass even basic tests so these are left out.

Formation of ducts in Australia

Howse [5] provides an excellent summary of the ducts that form in high-pressure systems and from sea breeze effects. By way of summary, some of the mechanisms that cause ducts to form are as follows:

- Subsidence (falling air) in high-pressure systems which causes a duct between about 400 m and 800 m to form over great distances along the coastal regions of Western, Southern and Eastern Australia including the Tasman Sea in summer. In winter and spring, weaker ducts are evident in the coastal regions at around 300 m. Subsidence ducts can also form over large regions of inland Australia between 1000 m and 1800 m from autumn to spring.
- Sea breeze ducts form where the cooler sea breeze meets a warmer off-land breeze. Sea breeze effects can also result in ducts at the top of escarpments such as along the Great Australian Bight near Eucla and along the Queensland coast. These ducts form where the warmer off-land breeze meets a cooler sea breeze at the edge of an escarpment, such ducts have been observed by the author to cause extreme refractive gradients that affect microwave propagation.
- Surface ducts form where the ground cools by radiation forming a cool layer close to the ground leaving warmer air above it. Such ducts are usually less than 20 m thick and are visible as a fog layer close to the ground. They form at night and break up after sunrise when heating of the ground reverses the process that formed the duct.
- Frontal ducts form where a wedge of cold air pushes under warm air to form a duct. These ducts may be several hundred km in length along the weather front and are locally short lived.
- Evaporative ducts form over water where the cooling near the surface from evaporation results in cool air

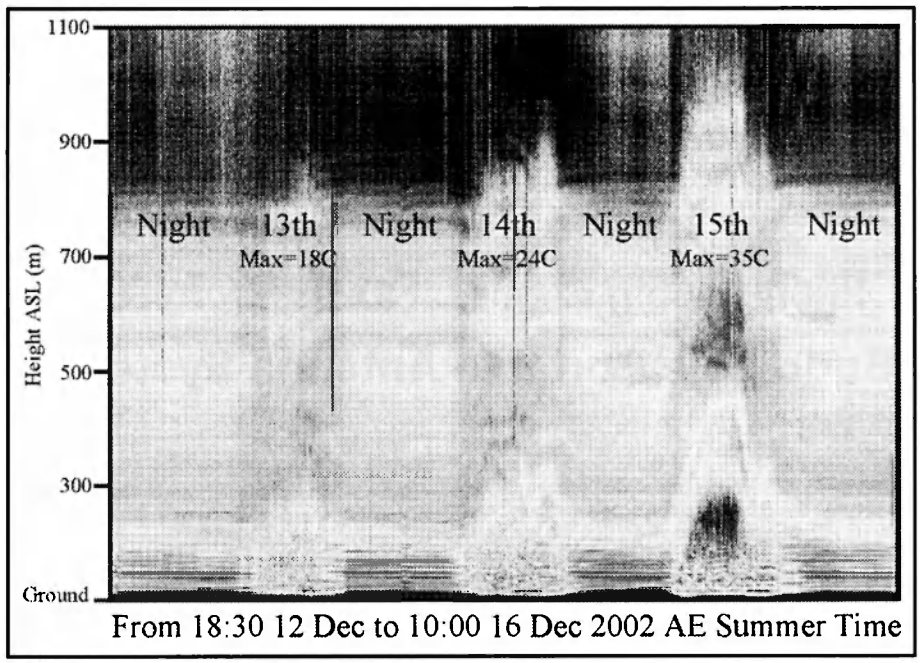


Figure 5. SODAR observations to a height of 1100 m over three days. A ground based temperature inversion is evident during the night to a height of 200 m ASL (100 m above ground). During the day, the plumes of rising warmer air break up the ground inversion. The daytime maximum temperatures are shown, higher maximums cause the ground inversion to be driven higher. A weak duct is evident at around 600 m. Blue areas represent lower humidity. 1400 measurements with 2 m vertical resolution.

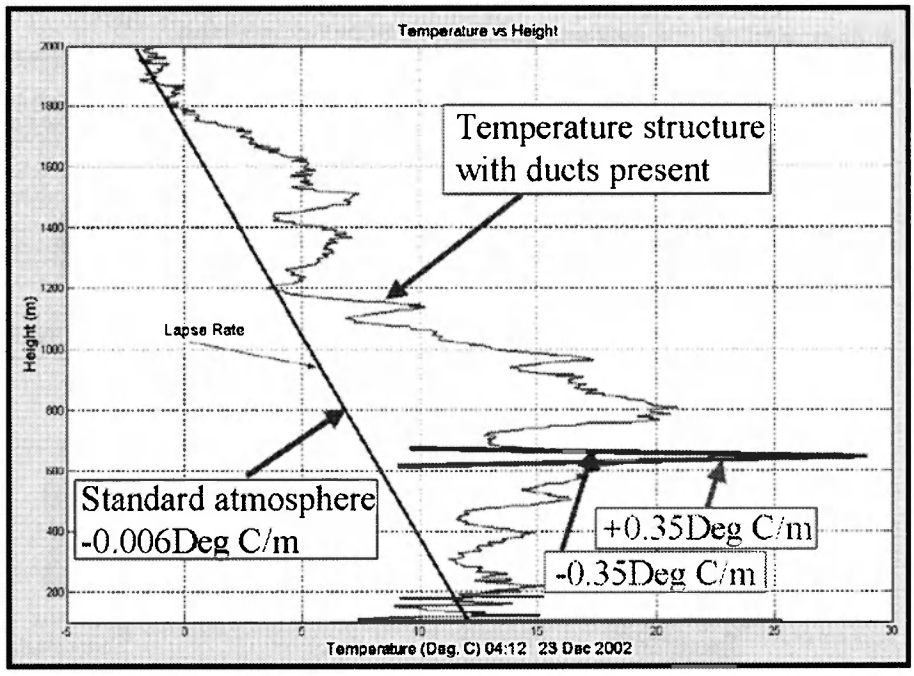


Figure 6. Vertical virtual temperature measurement with a duct present and the "normal" temperature lapse rate of –0.006 Degrees C/m shown as a solid line. This result is calculated from several SODAR return signal level results and illustrates the increase in temperature with height up to 800 m with several dramatic variations along the way. Maximum temperature gradient is close to 0.35 Degrees C/m with temperature changes of 7 degrees over just 20 m. Ground based ducts are also present.

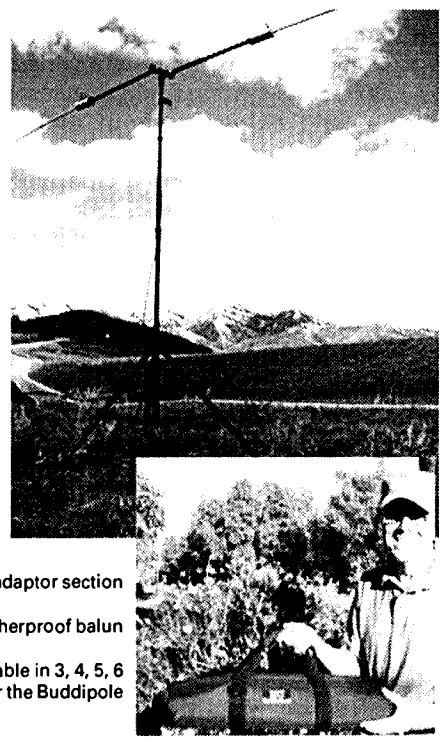
TTS Systems Communications Equipment

TTS Systems www.ttssystems.com.au **FREE CATALOGUE**

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

Buddipole Portable Antenna System



It's a dipole... It's a vertical... It fits in your travel bag! The Buddipole™ is more than an antenna; It's a versatile system for launching your signal. Optimised for transmit power and proven for DX work, the Buddipole™ is the secret weapon used by HF portable operators all around the world. Precision engineered for maximum performance from ultra light composite materials and High-Q coils. Zero-loss balun with Quick-Connect feedpoint.

The standard Buddipole antenna comes with—

- Two 22" black anodised aluminium arms
- Two multi-band coils (40m - 10m) with adjustable coil tap system (inc. 3 removable taps, with coils premarked for 40, 30, 20, 17, 15, 12, and 10 meters -- 6 and 2 meters are configured without coils)
- Two stainless steel telescopic whips, the VersaTee™ with 3/8" x 24 adaptors
- BNC/PL259 coax connector assembly (includes RF beads) with 25' of RG58 coax
- Nylon "packcloth" carry bag with velcro strap,
- Black thermoplastic carry case; ops manual.

DELUXE PACKAGE

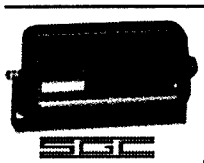
A popular purchase is the Buddipole™ Deluxe Package. This includes everything you need for setting up an efficient portable antenna solution anywhere in the world in just a few minutes. The package includes the following custom components which all fit into the padded cordura nylon custom-carrying bag:

- The std Buddipole Antenna (9 bands, 2 - 40 meters) +25 foot coax assembly (inc VersaTeel)
- Tripod - extendable legs and locking base
- Portable Mast – extends to 8' in height
- Rotating Arm Kit – change configurations
- Antenna System Bag – padded cordura nylon w/shoulder strap
- Extra Stainless Steel Telescopic Whip
- 3 extra Coil Clips
- Antenna Operating Manual
- FREE – New 10-page modelling report

This complete system is perfect for all types of situations — field day, DXpeditions, emergency services, etc. Put it in your suitcase, keep it in your RV or car, or have it ready for anytime you want a versatile and efficient portable antenna system up and running in minutes. The quality, performance, and versatility of this system is unmatched anywhere at any price.

OPTIONS

- A 16' telescopic mast with nylon guy kit. With an adaptor section the fits the Buddipole Tripod.
- Triple Ratio Switchable Balun. This versatile weatherproof balun with switched ratios of 1:1, 2:1 and 4:1.
- Military style Shock Cord Whips. These are available in 3, 4, 5, 6 and 7 sections. The maximum recommended size for the Buddipole antenna is 5 sections.



ADSP SPEAKER

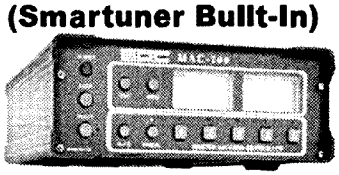
Works with the press of a button. Three modes: no noise reduction, the original ADSP, and the new ADSP2 noise reduction mode which provides up to 26 dB of noise reduction within the passband. ADSP2 Speaker is "One Touch" – simple to operate.

Z100 TUNER AND Z1000 HIGH POWER AUTO TUNER

MAC-200

MASTER ANTENNA CONTROLLER

(Smartuner Built-In)

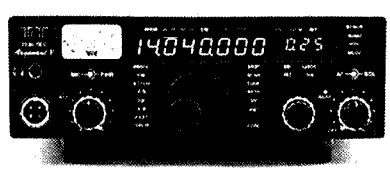


Controls

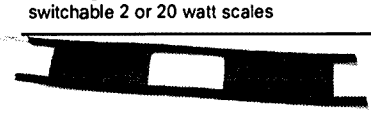
5 ANTENNAS
3 S0239 COAXIAL CONNECTORS
1 BALANCED ANTENNA OUTPUT
1 END FED LONG WIRE

"The box that brought my amateur radio hobby back to life"

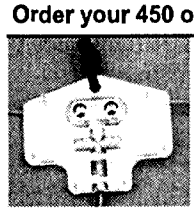
Model 516 Argonaut V IF-DSP QRP Transceiver



The benefits and features of IF-DSP, in a modem 20 watt HF transceiver. 20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjustable from 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP). Metering measures forward or reflected power in switchable 2 or 20 watt scales



Order your 450 ohm Ladder Line NOW



Ten-Tec 3003 Acro-Bat antenna hanger.

Made from UV resistant polycarbonate plastic, Hammers won't break it. Hardware is S/S Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna. or ladder line with internal pegs.

We have

SGC 237 Waterproof Auto Tuners
SGC 239 Economy Auto Tuners

Autek Antenna Analysers
Autek RF 2kW in-line Power meters

Lutron
Lutron Measuring Instruments

Vantage Pro Weather Stations

TEN-TEC KITS

below warm air and a temperature inversion.

Ducts or temperature inversions are readily evident through the atmosphere from visual observation. An elevated duct at 600 m is shown in Figure 1 and is the duct most often present in South Eastern Australia when long distance VHF propagation is observed towards the West in summer. Close inspection of the original photo used for Figure 1 reveals that the surface of the duct has a wave like structure.

Visual observations of ducts

Propagation via the 600 m duct can be stopped by high intervening terrain such as the Grampians in Western Victoria. Howse [5] comments on this terrain blocking effect noting that "the roughly East West valley between the end of the Great Dividing Range and the Otway Ranges may preserve the far end of the duct". In autumn and spring, high-pressure systems often sit over the mainland and have ducts at around 1400 m, such ducts enabling contacts between NSW and SA. Elevated ducts become weaker in the daytime and re-establish in the early evening.

Radiosonde data taken at various locations around Australia every 12 hours can be used to estimate the position of elevated ducts such as shown in Figures 8 and 13. Although the radiosonde flight times are not always optimum from a propagation point of view they provide a valuable indication of the long distance duct propagation conditions.

A surface duct formed by cooling of the air close to the ground is shown in Figure 2. Such surface ducts are generally between 3 m and 5 m high. Signals can be trapped by the surface duct and propagate along the ground until the duct dissipates or until a blocking object is encountered such as a line of trees or a hill. Signals can also be refracted from the top of a surface duct. Surface ducts break up after sunrise from heating of the ground and rise to dissipate between 50 m and 300 m above ground, Figure 5.

An evaporative duct is shown in Figure 3. Signals can propagate along the surface of the water in an evaporative duct. These ducts can be present for days at a time. Evaporative ducts can act as an RF mirror (and sometimes an optical mirror) and reflect signals from the top of the duct.

Ducts can be easily located by visual observation especially if the observation is close to the height of the duct as shown in Figures 1, 2 and 3.

Observed characteristics

The data used to draw conclusions about the characteristics of ducts was obtained from three different observation methods:

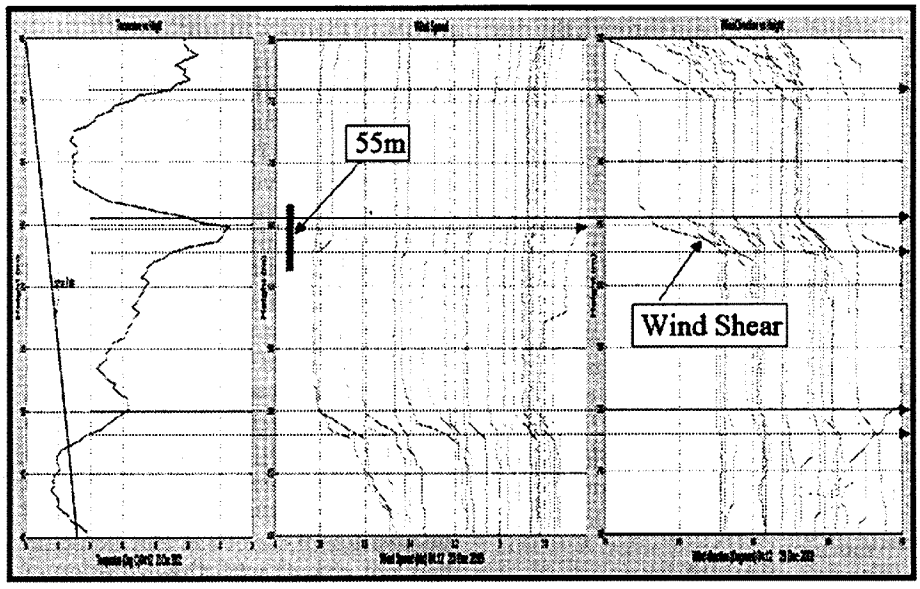


Figure 7. SODAR observation of the vertical structure of an elevated duct showing detail including wind speed and direction. There are two ducts evident, a weak one between 480 m and 500 m and a strong one between 630 m and 685 m. Changes in wind speed and direction are directly associated with the ducts.

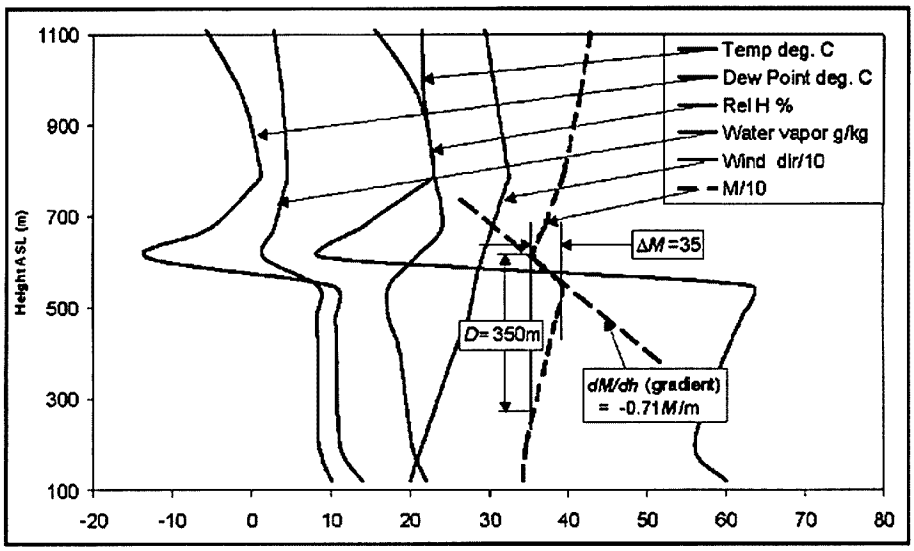


Figure 8. Radiosonde temperature, dew point, humidity, water vapour content, wind direction (divided by 10) and calculated *M* profile (divided by 10) showing an elevated duct at 600 m due to subsidence in a high-pressure system, Melbourne 0Z 21 Dec 2002, from [15]. The depth of the duct is 350 m, the gradient of the *M* profile in the duct is –0.71 *M*/m and the maximum *M* difference is 35 *M* units. (We could not print the full colour picture of Figure 8 . The editor can email colour images on request.)

- An acoustic pulse compression SOund Detection And Ranging (SODAR) system for obtaining high resolution vertical profiles of the atmosphere up to 2 km recently developed by the author [9,10].
- A large number of amateur radio contacts by the author in Western Australia and Victoria on the bands from 50 MHz to 1296 MHz plus the observations of many other amateurs. This work and the work of McAllister and Baker in conducting long term measurements between Albany and Salisbury is discussed by Howse [5].
- Professional work by the author on design and optimisation methods for fixed microwave radio links in the commercial bands below 10 GHz operating over distances of 30 km to 165 km.

The amateur radio observations led to numerous effects being observed during long distance propagation via ducts; most of these are listed below:

- Propagation distances of over 2000 km have been observed on all amateur bands from 144 MHz to 10 GHz.
- Ducts vary in their ability to transport signals, "weak" ducts may only propagate up to 144 MHz while "strong" ducts may sometimes propagate 10 GHz signals.
- As ducts become stronger and transport higher frequencies the lower frequencies seem to become weaker.
- Stations often report being "passed over" by the duct and hear nothing while stations at greater distances can work via the duct.
- Ducts can terminate abruptly with stations only 30 km further on hearing little or nothing.
- Ducts form in the evening and break up in the late morning but sometimes remain through the day although weaker than at night.
- Excellent ducts are present in Southern Australia from about December to March and over inland Australia from about March to October.

The professional observations lead to several other effects being observed on microwave paths of 30 km to 165 km:

- Extreme elevated ducts at a given location are always close to the same height at a given time of the year.
- The elevated ducts form in the late evening, are strongest around 6 am local time and break up in the late morning.
- Elevated ducts interact with microwave signals by refraction through the duct and/or propagation along the duct.
- Surface ducts formed by radiation cooling can be extreme and form a highly reflective layer close to the ground (for microwave signals).
- Surface ducts can propagate signals along the ground until they reach an obstruction.
- Surface ducts break up due to heating of the ground after sunrise.
- Very strong elevated ducts occur in Southern Australia in summer and in the more Northern parts of Australia in winter.
- The k-factor or sub-refraction fading [11,12] does not happen at all except in or very close to a duct. The k-factor of the gross atmosphere is 4/3 at all times. All of the effects attributed to k-factor fading can be more correctly explained by the effects of surface ducts [13]. The data in [13] presents a very strong case for surface ducts with a short multi-path delay being the cause of so called 'flat fading" on microwave paths and not the widely accepted k-factor. The argument over this new model for describing flat fading on microwave links [13] is still very current in spite of the strong evidence for it.

SODAR measurements

A pulse-compression SODAR measurement of the lower atmosphere to a height of 1100 m ASL for a period of seven days during a ducting event is shown in Figure 4 [9,10].

The measurements shown in Figures 4 and 5 are of the return signal level that is indicative of the vertical refractivity. Ducts are clearly indicated by the highest signal levels in red. Blue areas represent low refractivity and low humidity from low signal levels. The highest signal levels correspond well with the calculated M profile from a radiosonde measurement.

The position of the elevated duct at close to 600 m does not change at night over a period of seven days. During this time, several high-pressure systems passed with central pressures from 1019 hPa to 1030 hPa indicating that the position of the 600 m elevated duct does not change with the evolution of the high-pressure systems.

Several SODAR returns are averaged in Figure 6 to show the estimated virtual temperature structure. This gives a more

detailed look at the structure of ducts and shows that the vertical structure is very complex in contrast to low resolution radiosonde measurements such as those of Figure 8. The radiosonde measurements are, relatively speaking, low resolution because the sampling rate of the sensors is low and the rate of climb of the balloon is high so that only a few measurements are possible in the first 1000 m of the atmosphere. Figure 6 also shows very high temperature gradients within ducts. It is these gradients that create highly refractive layers.

The SODAR system also provides very high resolution measurements of wind. Several wind profiles through an elevated duct are shown in Figure 7. This data clearly shows the change in wind direction associated with an elevated duct. The internal gravity waves and the wind shear induced instability associated with the change in wind direction causes the surface of the duct to have a wave like structure in a similar way that wind over water can roughen the water surface [14].

The SODAR measurements were conducted over the summer 2002-3 at Mulgrave, Victoria from which the following observations were made:

- Elevated ducts form at a given height and break up at that height, they do not fall to become surface ducts.
- Strong ducts are present in the night and if present during the day are much weaker.
- Vertical duct structure is much more complex than shown by radiosonde measurements.
- An elevated duct can have several structures present in it, ducts within ducts.
- Several duct structures can be present at the same time including elevated ducts and ground ducts.
- Ground ducts do rise during the day but not sufficiently to result in long distance propagation. They become much weaker due to the effects of rising plumes of air breaking up their structure.
- Wind shear is present across the surface of an elevated duct.

From the SODAR observations shown in Figures 4, 5, 6 and 7, several of the misunderstandings set out above can be readily dismissed. In particular;

- Elevated ducts remain elevated, they form and break up at a given height.
- Ground ducts do rise after sunrise and then break up from thermal plumes that disrupt the duct during the day. Ground ducts do not transform into an elevated duct.

to be continued next month

Acknowledgment

Tele-IP Limited is acknowledged for providing data from its StratoSonde SODAR for use in this paper [9]. The many contributions from other amateurs by way of observations and just being there to make a contact are also acknowledged.

References

[1] R. A. Hull, "Air-Mass Conditions and the Bending of Ultra High Frequency Waves", QST June 1935.

[2] Isted G A (1958) Guglielmo Marconi and communication beyond the horizon: a short historical note. IEE Symposium on Long-Distance Propagation above 30 Mc/s, 28 Jan 1958. Pp. 79-83.

[3] Howard Oakley "The history of VHF propagation beyond line of sight", http://www.quercus.demon.co.uk/thistory.html.

[4] Kerr D E (1951)(editor) Propagation of Short Radio Waves. Reprinted by Dover Publications INC, New York, 1965

[5] Howse, W. J. "VHF, UHF and Microwave Propagation and The Great Australian Bight", Amateur Radio, Vol.69, No.3, March 2001, PP 4-7.

[6] Papers first presented at GippsTech 2003 and 2004.

[7] Consolidated and revised version of the paper published in 2004 by the NSW VHF Group,

[8] S. A. Isaakidis and T. D. Xenos, Progress in Electromagnetics Research,PIER 49, pp 257-271, 2004.

[9] http://www.stratosonde.com

[10] A. L. Martin., "A New Technology SODAR; Providing Very High Spatial and Temporal Resolution Profiling to 1800 m", In Proc. 12th International Symposium on Acoustic remote Sensing, 11-16 July 2004, Clare College, Cambridge UK, pp 153-157.

[11] R. Blackwell et. al, The VHF/UHF Handbook, UK, DIR Publishing, First Ed, 1992. pp. 2.23–2.24.

[12] ITU-R Study Group 3, Recommendation P.530-1999.

[13] Andrew L. Martin, "Considering the Impact of the Draft New ITU-R Working Party 9A Report on the Design of Line-of-Sight Microwave Radio Systems" Proc. of the 7th ECRR, Dresden, Germany, 12-15 September 2000, pp 263 – 268.

[14] http://pcl.physics.uwo.ca/pclhtml/gravitywaves.html

[15] http://weather.uwyo.edu/upperair/sounding.html

[16] J. A. Hermann et.al. "Impact of Elevated Atmospheric Structures Upon Radio-Refractivity and Propagation", http:/www.ips.gov.au/IPSHosted/NCRS/wars/wars2002/proceeding.

[17] I. M. Brooks et. al. "Observations of Strong Surface Radar Ducts Over the Persian Gulf". www.env.leeds.ac.uk/~ibrooks/ publications/JAM1999-radar-ducts.pdf.

[18] A. D. Papatsoris, "Spectrum Monitoring and Measurement Techniques", http://www.dtk.gov.mk/Portals/57ad7180-c5e7-49f5-b282-c6475cdb7ee7/Space-wave%20Propagation.ppt.

[19] "VHF – UHF..An Expanding World", Amateur Radio, Vol.71 No. 2, February 2003.

Part 2 of this article, including Figures 9 – 20, will be published in the July edition of *Amateur Radio*

Using the HP 8405A vector voltmeter

Richard Sawday VK5ZLR

In May 1966 HP released their 8405A Vector Voltmeter, which can measure the amplitude and phase of two RF signals anywhere between 1MHz and 1GHz, and do it with considerable accuracy. These units were manufactured for well over 20 years, and are by no means obsolete.

Using the Vector Volt Meter (VVM) and a signal source, you can determine the, Impedance, Reactance, Resistance, Reflection Coefficent, VSWR, Gain, Phase Shift and Return Loss of a transmission line, antenna, filter, amplifier, load or other RF component. Figure 1 shows the set up and Figure 2 the VSWR measurementAlso you can calibrate Rubidium standards, measure RF leakage and determine antenna radiation patterns with an 8405A.

Now this is one powerful tool !!

So when I was fortunate enough to acquire an 8405A there was great enthusiasm to reveal the secrets of all my antennas and cables. However I was not best pleased when my new VVM didn't work, the reason why became immediately apparent. Someone had removed the probe circuit boards. Needless to say replacements are unobtainable.

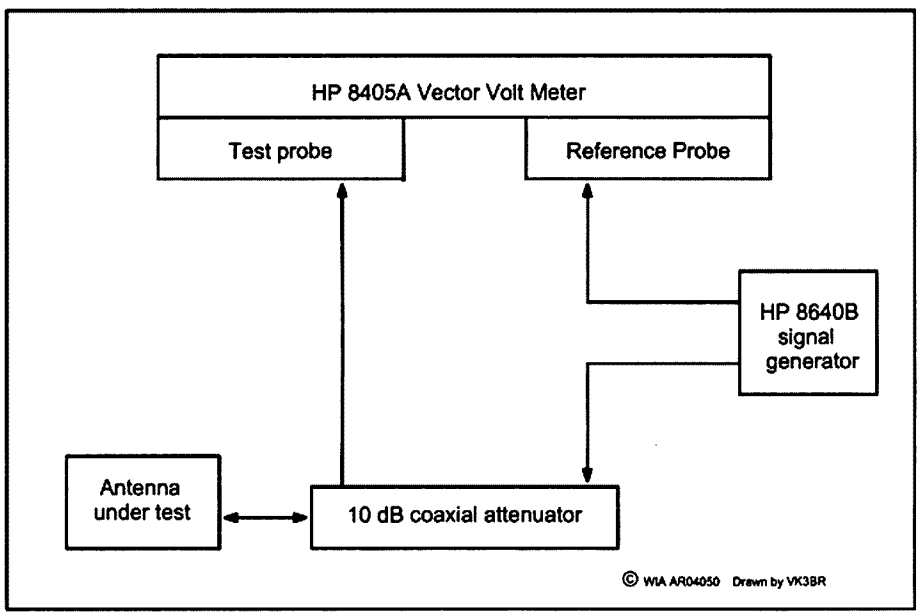


Figure 1. Test set-up using HP8405A to determine antenna feed point characteristics. Arrows indicate signal flow.

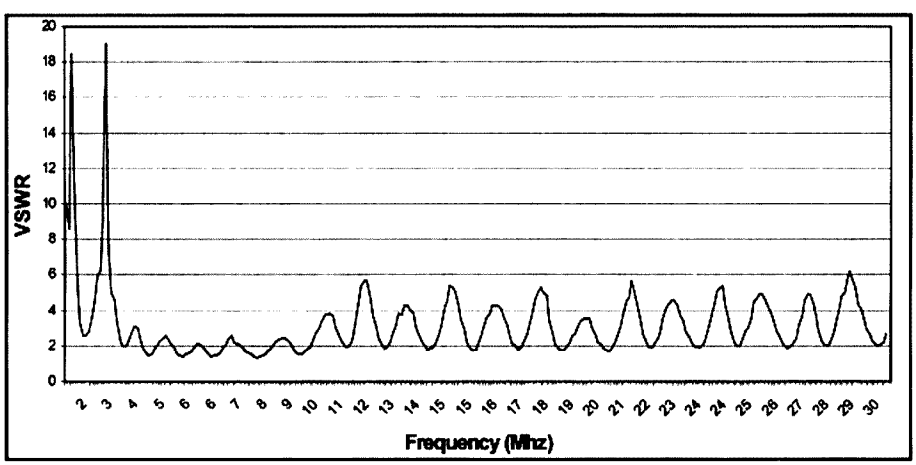


Figure 2. Aerial VSWR measurement

The probes are about the same size as a biro, and the probe circuit board fits inside. Remanufacturing this board, given the space constraints did not seem practical, so with a pair of garden secateurs I severed both probes, and set out to make new ones from scratch.

The manual doesn't give component types for the FETs and hot carrier diodes in the probe, so with nothing else to go on, the components were selected by guesswork.

One 2SJ74 P-channel FET and four over-the-counter Schottky diodes seemed to be about right. The probes are actually a sampling gate, so the frequency response of the components probably doesn't need to be much more than a few MHz, even when testing RF signals of hundreds of MHz.

Two prototype probes were breadboarded, and after several attempts, to my absolute astonishment, it actually worked. So, a pair of small metal RF-proof boxes was purchased and the circuit was rebuilt inside them using copper backed Veroboard. At this point it failed completely and would not work at all.

Here followed many days of frustration. The problem turned out to be the stray capacitance between the copper tracks on the Veroboard. So the probes were rebuilt again using the rats-nest technique and squeezed into the small metal boxes, with very satisfactory results.

Now having the unit working, it had to earn its keep. Out on the antenna farm there is an HF antenna, that for want of a better description might best be described as a Biconical Monopole. There has been some speculation about what this antenna might look like in

Spotlight on SWLing

Robin Harwood VK7RH

Winter is officially here and I have noticed that daytime propagation is considerably better than the nighttime. This is normal, but what is different this year is that, with the disappearance due to budgetary cutbacks by some of the major broadcasters, some smaller stations are beginning to appear.

The utility allocations remain as congested as they have always been but this increasingly seems to be from illegal or pirate operations. The major users have either switched to satellite or are employing extremely sophisticated digital modes. Many of these illegal activities have been straying into our exclusive amateur allocations for decades and are now finding vacant frequencies also in broadcasting, aeronautical and other utility allocations.

Unusual station

The sunspot numbers have decreased and the higher frequencies are not propagating that well so there is increased activity on the lower channels. One unusual station I did come across was the Israeli Defence Force broadcasting network on 6973 around 2100. It is in Hebrew and it is on this channel to cover up some dead spots within Israel that are missed on FM or AM. 6973 is broadcasting on USB with carrier and reception is best on AM.

The major Kol Israel network is again scheduled to quit HF this month but have we not heard this so often in the past that we will only believe it if it indeed disappears. There has been an ongoing power struggle for the control of this organisation with the director-general being sacked recently.

Arabs still on air

The English Service of United Arab Radio from Dubai also has disappeared. This was easily heard in our local afternoons on 17 or 21 MHz. However the Emirates have not completely disappeared as the Merlin operated HF site in Abu Dhabi (also referred to as Dhabbiyah) continues for a variety of programmers and broadcasters.

75th anniversary of FM

This month happens to be the 75th anniversary of the invention of frequency modulation. Major Edwin Armstrong invented and developed this in 1930 and eventually commenced experimental broadcasts with it from a site in New Jersey. The tower is still there and is in use, particularly after September 11th,

When the Twin Towers went down. I did get an email telling me of the date and time for the anniversary and that permission had been obtained from the FCC to once again utilise the 41 to 42 MHz band to recreate this. I believe it will be in mid June and will also be streamed on the Internet. Armstrong had a long legal battle to get recognition for his invention of FM and he never won the patent right in his lifetime. He became so depressed that he committed suicide in 1954. His widow took up the battle and it was many years after this that the long legal fight was successful.

A death in the family

My Pentium 75 has finally given up the ghost after undergoing several upgrades. Next month I will be writing this column on a totally new system which hopefully will no longer lock up with the dreaded blue screens and crash. I will also eventually go on broadband with ADSL because I find that downloading via dialup is slower but wonder if the ADSL modem will significantly interfere with my monitoring. I will turn it off if that transpires.

DXtuners

Fred VK3AQN, recently emailed me with his comments on Echolink and also on a system in Florida to remotely operate a station on HF. It does sound interesting but I am personally wary of doing that because of the legal ramifications. I am presently happy with being able to remotely operate receivers via the Internet. These are known as Dxtuners and were formerly known as Javoradio.

Well that is all for this month. Don't forget you can email me your comments at vk7rh@wia.org.au. 73 de VK7RH.

ar

Using the HP 8405A vector voltmeter *continued*

terms of its VSWR, now the question has been answered, using the 8405A, an HP8640B as a signal source and an Excel spreadsheet to calculate and graph the results.

The Mathematics involved in translating a voltage and phase reading off the Vector Volt-Meter into VSWR is quite complex, however I have created a small Excel spreadsheet to handle all this, I would be happy to email it to anyone interested. My email is rsawday@bigpond.com.au.

ar

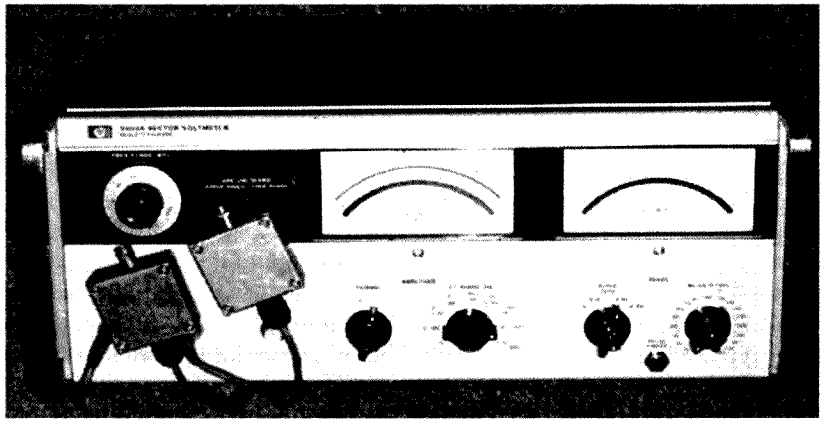


Photo 1 - The HP 8405A Vector Voltmeter

Unravelling the mysteries of connecting radios to antennas ~ *Part 3*

The VSWR head and interference considerations

Brian Clarke, VK2GCE
brianclarke01@optusnet.com.au

The VSWR head

What is the function of the VSWR head? It provides signals proportional to the forward and return RF voltages at the point it is monitoring on a TL These signals are fed to a circuit that drives an indicator, often an analog meter. If there is no return voltage, the meter should indicate a VSWR of 1:1. If the return voltage is half the forward voltage, the VSWR is 3:1. If you look at the meter scale of any analog VSWR meter, you will see that the 3:1 point is at one-half FSD. The meter and its drive circuitry need not be at the same place as the VSWR head.

The important question is: what does the VSWR head tell us? It should be used to provide the signals that let us know how well our antenna is matched to its feeder. Of course, it can be used to measure VSWR at any point along the RF transmission chain, but the VSWR at the antenna feed point is the one that really matters.

VSWR head placement

It is commonly believed that, whether the output of a TL is connected to its characteristic impedance or not, the ratio (VSWR) of high to low voltages will be the same at all points along the TL. These highs and lows are created by the interaction of the forward and reflected RF waves as they travel along the line.

Suppose we have a multi-frequency dipole antenna that we use for all the HF frequencies at which our transceiver can operate. Say we have a 100 feet long TL consisting of RG-58 coaxial cable. In the 6 m band, the loss in 100 feet of RG-58 is about 3.5 dB. Now if the VSWR at the antenna feed point is 5.8:1, what would the VSWR meter read if the VSWR head were at the transceiver end of the TL?

Assume that we have a power level of P_I fed into the transceiver end of the TL. The power at the antenna end is P_I less 3.5 dB. Because the VSWR is 5.8:1 at the antenna, the power fed back down the TL is (P_I less 3.5 dB) x 50 %; ie, P_I less 6.5 dB. Then the reflected power is reduced by a further 3.5 dB as it travels back down the cable, so at the transceiver end, the return power is P_I less 10 dB. Thus, the ratio of forward to return power is 10 dB (ie, $P_{FWD} / P_{RET} = 10$) at the transceiver end. What will the VSWR meter display?

Knowing that $P = V^2 / R$, and assuming that the TL has a constant impedance, we can say that

P is proportional to V^2; so, V_{FWD} will be $\sqrt{10}$ times $V_{RET} = 3.163 * V_{RET}$.

Now VSWR = $(V_f+V_r) / (V_f-V_r)$
= $(V_f/V_r+1) / (V_f/V_r - 1)$

Substituting the voltage ratio calculated above, we get a VSWR of (3.163 + 1)/(3.163 – 1) or about 1.9:1, which is somewhat different from the 5.8:1 at the antenna feed point. And worse, we would probably accept a VSWR of 1.9:1 and start operating.

Therefore, the best place for the VSWR head is at the antenna feed point.

Now suppose we are using the same TL with 3.5 dB loss, feeding an antenna with VSWR = 3:1, and we want to deliver 100 W into the antenna feed point. To what output level must we crank up our transceiver? 100 W + 3.5 dB = 224 W. And as there is a 3:1 VSWR at the feed point, what is the maximum voltage on the TL? Let's assume that the 3:1 VSWR at the antenna feed point is caused by the antenna impedance of 150 Ω. The 100 W of power fed into 150 Ω will develop 122 V. By similar calculations (224 W fed into 50 Ω) the voltage at the transceiver end is 106 V. These voltages are OK for RG-58 cable – but if you had been running 400 W input to the antenna, and the VSWR had been 10:1, the voltage at the antenna end would have been about 450 V. That's still OK for RG-58 in dry weather, but let the coaxial cable fray a bit, and the humidity rise . . .

Most simple VSWR heads detect the TL voltage. Two samples are taken, one of the forward-going wave and one of the return wave. In a good VSWR head, each sample will discriminate against the voltage in the opposite direction by about 40 dB. In some store-bought models, the display circuitry reads voltage as though the line impedance were 50 Ω. If the VSWR head is at the antenna feed point and the antenna impedance is other than 50 Ω, this will mean that the actual voltage readings will be inaccurate. However, the forward and return voltages will be inaccurate in the same ratio; consequently, the VSWR displayed will still be correct, within the limits of that particular design.

I have suggested that the VSWR head should be at the antenna feed point. However, most store-bought VSWR heads are designed for unbalanced line measurements. Such VSWR heads are best used for metering with unbalanced antennas. If you have a balanced antenna, you will have difficulty finding store-bought VSWR heads to suit. But the keen experimenter can find designs for roll-your-own balanced-line VSWR heads.

Interference generated by the VSWR circuitry

Most VSWR circuitry uses diodes in series with the analog meter to produce a dc voltage. In order to be sensitive to very small return voltages, these are usually germanium or Schottky diodes, which require a forward bias of about 0.2 V for conduction. When we monitor 100 W forward power into 50 Ω, the through-

line voltage is 71 V. With such voltages, commutation noise is likely to be about –50 dBc. Could this be a problem?

The current Australian Communications Authority regulations under which we operate state that the maximum spurious content of our HF transmissions must not exceed –43 dBc – 10 log (W_{PEP}) or a maximum of –50 dBc, whichever is less stringent.

For all other emissions, the limit is –43 dBc – log P or –70 dBc; again, whichever is less stringent. So, feeding 100 W, or even less, into our antenna and past our VSWR head may generate spurious emissions greater than –50 dBc, which would contravene the regulations.

The signal from the commutating diodes is at –31 dBW inside the VSWR head. If the VSWR head is at the antenna feed point, this signal is transmitted to the antenna via about 35 dB of isolation. The isolation is provided by the spacing of the lines L1 and L2 from the through-line input – see Figure 8. Shielding of the VSWR head will have little effect – we are looking at a conduction effect rather than a radiation one.

This spurious signal will be just detectable at the –137 dBW level (1 µV into 50 Ω) at 10 MHz, if the receiving antenna is 6 km away in a straight line. This maximum distance is based on an estimate of the free-space transmission loss between similar antennas (RadCom Handbook, 1982:11.6) and the detailed calculations are given in Appendix 1. Typically, such an interfering signal will be picked up by most receivers out to the horizon on the ground-wave, but there will be no sky-wave by refraction from the ionosphere. The higher harmonics of a 10 MHz signal will be attenuated more severely and so will become undetectable at shorter distances. For instance, the 5th harmonic (6m band) commutation

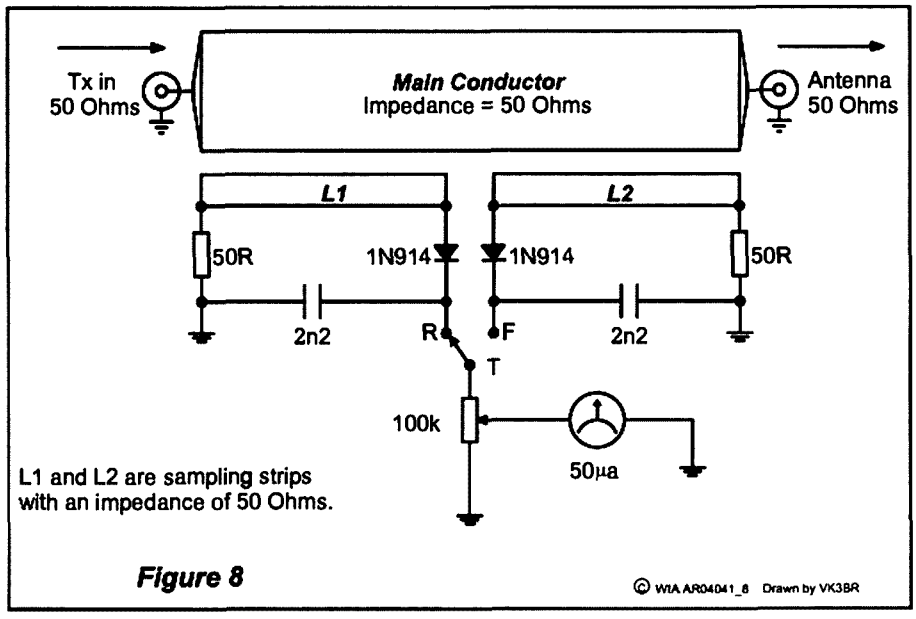


Fig 8 – A typical VSWR meter.

signal will be just detectable at 2.7 km. What about the 20th harmonic, falling within the TV broadcast bands? Here, the required sensitivity is 1 mV into 75 Ω; ie, –79 dBW, and the distance for a just-detectable signal is less than a metre – therefore, only TV sets in your own home may possibly suffer interference.

These figures demonstrate that, once you have adjusted your ACU, there could be a case for disconnecting the VSWR meter drive circuitry that contains the diode(s). This would reduce the spurious emissions when you transmit and the risk of noise generated by irate neighbours. Reducing the power into your antenna has little effect on this spurious signal generation until the diodes are no longer commutating. Even if the whole VSWR meter is at the transceiver end, the TL losses affect these calculations by perhaps 3 dB at most.

Note: the figures derived in this section are really worst case for a particular kind of VSWR head and display circuitry. See Appendix 1 for details of the calculations and the assumptions made. If your VSWR head uses diodes connected directly to the through-line, your situation is far worse – refracted sky-waves could cause interference hundreds of kilometres away.

The voltages present during reception are so small that the diodes will not be switching and no noise will be generated. So, the VSWR head can be left in circuit during reception with no deleterious effects. However, this problem of diode commutation noise is crying out for a creative solution, particularly if the diode circuitry is at the antenna feed point; perhaps we need to go back to thermocouples? Alternatively, look again at Figure 8 to see a possible solution when the indicator is remote from the VSWR head.

Appendix 1

Radiated interference from a typical VSWR head

Calculation of free space power transmission

$P_{RX} = P_{TX} + G_{AETX} + G_{AERX} - L_{FS}$

where

P_{RX} = power of signal at receive antenna feed point

P_{TX} = transmitter power fed to antenna feed point

G_{AETX} = gain of transmit antenna

G_{AERX} = gain of receive antenna

L_{FS} = free space loss
= 32.45 + 20 log f (MHz) + 20 log distance (km)

Note: All figures are in dB format. Power levels are usually referred to 1 W; ie, dBW.

A more complete rendition of this equation would take feed-line losses into account, thus:

$P_{RX} = P_{TX} + G_{AETX} - L_{TXFL} + G_{AERX} - L_{RXFL} - L_{FS}$

Example

This example considers possible interference caused by spurious signals that will be generated by diodes in the VSWR head – if they are left in circuit during transmission. It expands on the earlier discussion under the heading, "Interference generated by the VSWR circuitry".

Scenario assumptions:

a. the VSWR head uses germanium

diodes, with a forward commutating bias requirement of 0.2 V, and fed by a 50 Ω TL type pick-up

b. the transmitting antenna has 0 dB gain in the direction of the receiving antenna
c. the receiving antenna has 0 dB gain in the direction of the transmitting antenna
d. the receiving antenna feed-line has zero loss
e. the main transmit power is 100 W, measured by the VSWR head at the antenna feed-point
f. the amateur HF receiver sensitivity is 1 μV into 50 Ω; ie, power level of –137 dBW (Case 1)
g. the TV receiver sensitivity is 1 mV into 75 Ω; ie, power level of –79 dBW (Case 2)
h. the isolation L_{PU} between the main TL and the pick-ups in the VSWR head is 35 dB

Using these simplifying assumptions, the free space power equation becomes

$P_{RX} = P_{TX} - L_{PU} - L_{FS}$

where:

P_{TX} = the power level of the spurious signal generated by the diodes

L_{PU} = the isolation in the VSWR head between the main line and the TL pickups.

The peak RF voltage at the diode spurious-generator is 0.2 V, ie, an RMS value of 141 mV, and this appears across the 50 Ω pick-up TL.

So $P_{TX} = (0.141)^2 / 50 = 0.4$ mW or – 34 dBW.

Case 1

Find the minimum free-space loss which will just prevent interference to the amateur HF receiver, when the spurious signal is around 10 MHz.

The simplified free-space equation becomes:

$-137 = -34 - 35 - L_{FS}$

from which $L_{FS} = 68$ dB

As shown above, L_{FS} depends on frequency and distance

Now, what is the minimum line-of-sight distance to avoid interference?

Inserting values into the L_{FS} equation:

$68 = 32.45 + 20 \log (10) + 20 \log (km)$

So $20 \log (km) = 68 - 32.45 - 20 = 15.55$

Taking antilogs gives the minimum distance as 6 km.

At 10 MHz, on an antenna designed for a lower fundamental frequency, the polarisation is likely to be horizontal, so the signal will have a wide range of vertical radiation angles. For the lower angles of radiation, the interfering signal would be receivable as a ground wave out to the horizon. For the higher radiation angles it would have to be a refracted sky-wave; but then the transmission path length would far exceed 6 km, and there would be no interference.

If the antenna were vertical, its low-angle, omni-directional radiation pattern would be likely to cause interference out to a range of about 6 km in all directions.

Case 2

Find the minimum free-space loss which will just prevent interference to the TV receiver.

The simplified free-space transmission equation

$P_{RX} = P_{TX} - L_{PU} - L_{FS}$

becomes:

$-79 = -34 - 35 - L_{FS}$

from which

$L_{FS} = 10$ dB

Assume that the receiver is tuned to 200 MHz (TV ch. 9). What now is the minimum line-of-sight distance to avoid interference?

As before, the free-space loss depends on frequency and distance:

$L_{FS} = 32.45 + 20 \log f$ (MHz) + 20 log distance (km)

Inserting values into this equation:

$10 = 32.45 + 20 \log (200) + 20 \log (km)$

$= 32.45 + 46 + 20 \log (km)$

So $20 \log (km) = 10 - 32.45 - 46 = -68.45$

Taking antilogs gives the minimum distance as 0.000378 km or 378 mm.

This shows that, unless its antenna is situated adjacent to the source antenna, the TV receiver will suffer no interference, even on the lower frequencies such as 64 MHz (TV ch. 2).

Lessons

1. Try to work out a way to disconnect the diodes inside your VSWR head after you have tuned up.
2. Keep your transmitting antenna clear of your neighbour's TV antennas.

To be continued

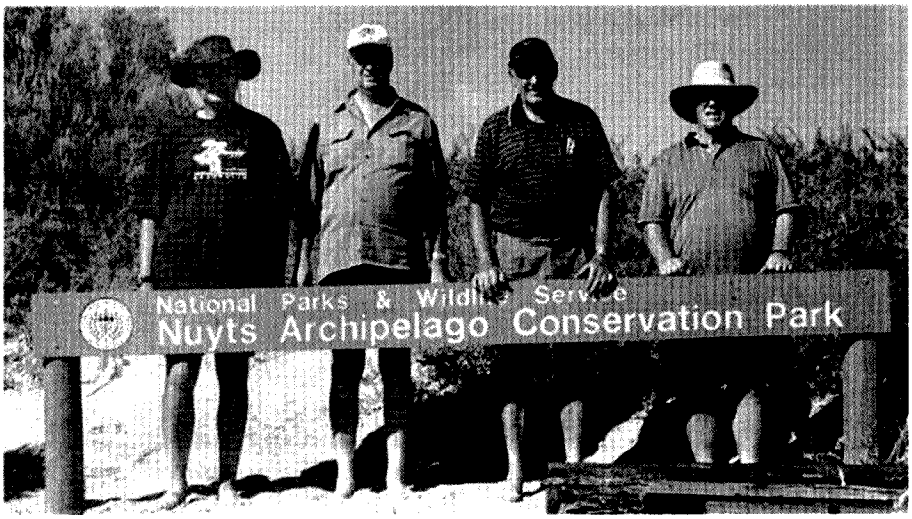
Part 4 (final) of *Unravelling the mysteries of connecting radios to antennas* will appear in the July issue of *Amateur Radio*

VI5PN operation – a great success

Peter Forbes VK3QI

7220 contacts and 104 countries worked

Four Victorian hams, Peter VK3QI, Keith VK3FT, Max VK3WT and Jack VK3WWW, successfully activated St Peter Island. Nuyt's Archipelago, IOTA OC-220 off the coast from Ceduna in far west South Australia the weekend of the 8, 9, 10th April.



The team: Peter VK3QI, Keith VK3FT, Max VK3WT and Jack VK3WWW

After completing the 20 hour drive to Ceduna with equipment, water and fuel, the boat from Ceduna Boat Charters, a 7.5 metre Shark Cat was able to ferry them right to the operating site on the north west side of the island. Arriving at 10 am, and working in quite hot and sunny conditions, everything was setup and ready to go by 6 pm Thursday 7th.

Radio conditions were quite good over the ensuing 105 hours of operation, finishing at 6 am local time on Tuesday 12th April. Pack-up and departure is always quicker and the group were back in Ceduna by 11 am . After staying the night at Ceduna, to clean up and gain some well earned sleep, the group drove the 22 hour trip back to Melbourne arriving 5 am Thursday.

The two main operating positions were as follows: For SSB, a IC706 and a Emtron DX1 amplifier to a rotatable TH3MK3 beam mounted on a sand hill about 8 metres ASL. For CW, a FT100D and a Metron MA1000 amplifier to a Hy-Gain AV640, 40 to 6 metre vertical, actually mounted in the ocean.

All power was obtained from a Honda EU20i with two EU10i units as backup (but not needed).

A third setup, using an IC706 to a variety of wire dipoles on fibreglass support poles at 40 feet, was used mainly for VK contacts on 40, 80 and 160mx.

Weather conditions were fine for the entire time, but very hot and windy conditions on the Saturday tested out the group's capabilities at setting up tents and antennas that could withstand the 50 knot winds blowing from the north straight onto the beach where they were camped. Incidentally, at 41 degrees, Ceduna, some 16 kms north of the island had its hottest ever recorded April day. The dust over Ceduna could be seen from the island, but the particular problem on the island, was the high level of fine sand blown off the beach into the operating positions. Needless to say, with 4 island operation experiences under their belt now, the group were able to proceed with minimal interruption.

Now that the computerised logs have been completed, contact statistics can be announced.

COUNTRIES WORKED

3D2, 4K, 4S, 4X, 5B, 6Y, 8Q, 9A, 9H, 9K, 9M2, 9M6, 9V, A3, A7, BV, BY, CE, CO, CT, CT3, CU, DJ, DU, EA, EA6, EA8, EI, EK, EL, ER, ES, EU, EX, EY, F, FK, FO, G, GI, GJ, GM, GW, HA, HB, HB0, HC, HK, HL, HR, HS, I, IS0, JA, JT, JW, K, KH0, KH6, KL7, KP4, LA, LX, LY, LZ, OA, OE, OH, OK, OM, ON, OZ, P2, P4, PA, PY, R1, S5, SM, SP, SV, T9, TF, TK, UA1, UA0,UL, UN, UR, V85, VE, VK, VR2, VU, XE, YB, YL, YO, YU, YV, Z3, ZL, ZP, ZS

= 104 COUNTRIES

BANDS/ MODES	CW	SSB	TOTAL
10mx	347	242	589
12mx	244		244
15mx	720	579	1299
17mx	113	8	121
20mx	149	2288	2437
30mx	1980	1	1981
40mx	374	108	482
80mx	-	56	56
160mx	-	12	12
TOTAL	3927	3294	7221

CONTINENTS/ MODES	CW	SSB	TOTAL
AF	9	6	15
AN	2	-	2
AS	1484	828	2312
EU	1719	1895	3614
NA	636	244	880
OC	5	383	388
SA	9	6	15
TOTAL	3927	3294	7221

The camp site TH3 Mk3 and the wire dipoles

The special callsign was in honour of the 350th anniversary of the death of the Dutch explorer and VOC man, Pieter Nuyts, who died in 1655. Nuyts was present on 't Gulden Seepaert, captained by Francois Thijssen, which accidentally discovered the Australian south coast in 1627 on its way to Batavia, after being carried too far south by the strong westerlies.

For those in Australia who worked the group and wish a special commemorative qsl card, you may qsl via the VK3 buro or direct to VK3QI, QTHR.

ar

WIA Comment *continued*

The first year of a National WIA

the evolution of the Advisory Committees, and we are now addressing the need for better two-way communication with those Committees.

It now seems that our original prediction that our membership, with new members at least balancing those who have ceased to be members, will be correct and we will finish the first billing cycle with at least as many members as we started.

There is no doubt that the WIA has, in its first year faced more challenges and threats than anyone believed possible at the start of the year. I believe that the WIA has responded competently and, I hope, is perceived as the responsible and effective voice of Australian amateur radio.

Each of us who accepted a role on the board of the WIA after the adoption of the new Constitution just one year ago was very aware of the difficulties that we faced and the importance of somehow doing our best to persuade those who were unconvinced that the WIA could not merely perform as well as it had under its old federal structure, but could perform better.

I would like to think that we have succeeded.

ar

Peter Gibson VK3AZL

A simple wind direction indicator

And now for something a little different. In the Dutch Amateur radio journal "Electron" for February 2005, Cees Spierenburg, PA3FXO describes a simple wind direction indicator.

Figure 1 shows the circuit of the indicator. It is divided into two halves. The head unit, which is mounted outside in a suitable place to accurately indicate the correct wind direction, and the indicator unit, which is installed inside were it can be seen. The left half of the circuit is the head unit whilst the right side of the circuit is the indoor display unit.

The circuit operates by feeding a stable voltage to a fixed voltage divider in the head end. Any 1 of 8 reed switches in the head end is selected by a magnet that rotates with the wind. Each reed selects one step on the voltage divider that is unique to each position as the shaft rotates. If the voltage increases with clockwise rotation, then the indoor display should be assembled in the same manner.

The LM3914 integrated circuit operates by taking a voltage as input and driving an array of up to 10 LEDs to represent the voltage level at its input. The actual voltage range as well as bar or dot display can be selected. In this case, the maximum voltage input will be 4.0Volts and R2 is adjusted such that when S8 is closed, the LED at pin 12 is lit. If S1 is then closed, the LED at pin 1 should be lit. This is the only adjustment necessary. Dot display is selected by leaving pin 9 open circuit.

The picture shows the construction of both ends, with emphasis on the head end. The unit in the centre is the heart of the head end. It consists of two circuit boards held apart by the eight reed switches and the shaft. The board at the bottom also contains the voltage divider. The rotating shaft is supported by ball bearings, which should be used to allow the unit to swing in light breezes. The individual reed switches are selected by a magnet attached to the rotating shaft. In the picture it appears that a magnet as used in security systems is used. The unit on the left is a piece of plastic tubing of suitable diameter with a suitable base. The switch unit is placed into the plastic tube and fixed by whatever manner desired. The hollow cylinder on the right is the lid that is mounted on the top to complete the weatherproofing. A suitable arrow assembly is fixed to the shaft at the top with the lid attached to that so that both rotate freely.

In contrast, the indoor display is built in a simple box with the driver on any suitable board mounted behind the display. As mentioned above, make sure that the display is wired so it rotates in the same direction as the head unit.

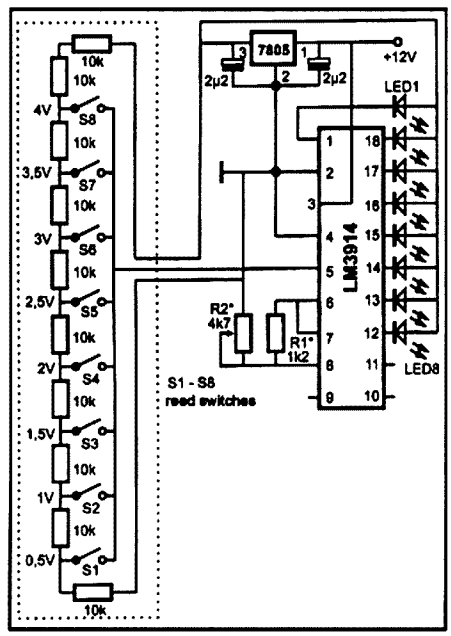


Figure 1 Schematic of wind direction indicator

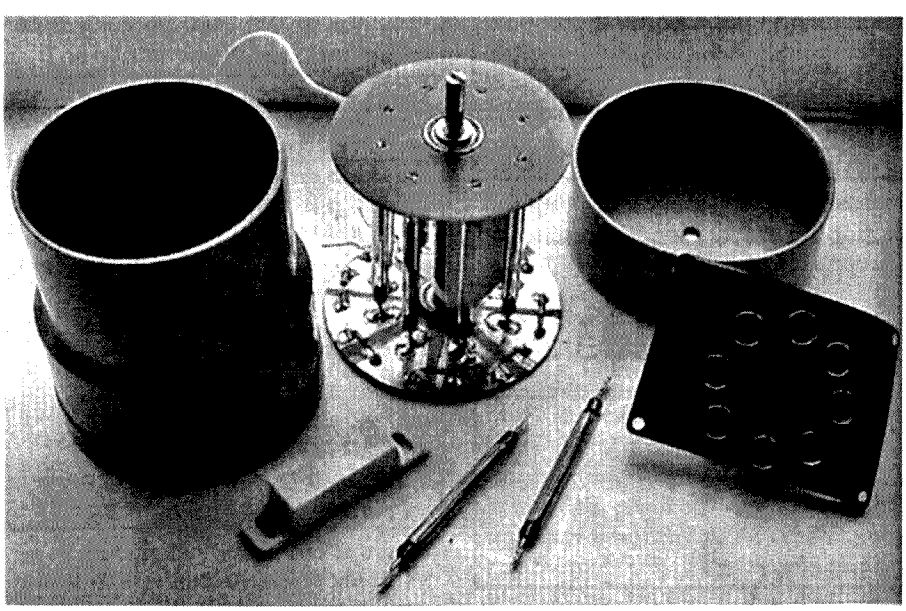


Photo 1.Construction of head end and indoor display

Technical abstracts

Peter Gibson VK3AZL

Mounting Yagis

In CQ for November 2004, Kent Britain, WA5VJB in his "Antennas" column describes some of his findings regarding the mounting of Yagi antennas.

With the mast coming in at a 90-degree angle to the element, as you would find in a horizontally polarized antenna (Figure 2), gain variation was less than 0.1dB and that 0.1dB was when the mast was very close to an element. Gain variation was virtually undetectable when the mounting mast was placed between the elements.

What about end mounting a vertically polarized antennas? End mounting (Figure 3) also showed little variation. When the mast was very close to the reflector, it would detune the reflector element and some variation was noted.

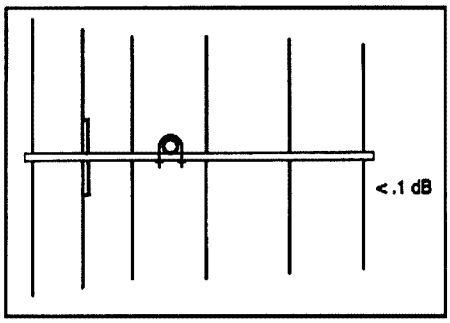


Figure 2. Horizontally mounting a Yagi

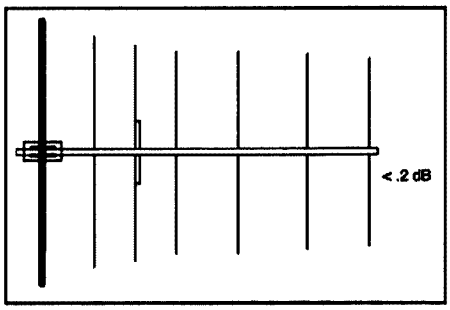


Figure 3. End mounting a Yagi

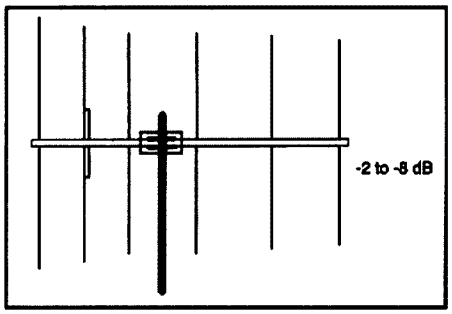


Figure 4. Mid mounting a Yagi on a short mast

There were also points at which the reflector and mast were ¼ and ½ wavelength apart, which showed some interaction, but variations were seldom even 0.2dB.

Mounting the mast through the antenna, but stopping at the boom (Figure 4), greatly detuned the antenna. As tested at different points along the mast, the gain change varied from –2dB to –8dB. The greatest dips were when the mast was close to an element. If you absolutely have to mount a Yagi this way, put the mast equidistant between two of the director elements, and as far as practical from the driven element. Leave just enough mast above the boom for the clamp to attach firmly, but no higher.

Mounting the mast completely through the antenna (Figure 5) completely messed it up, and again, having the mast close to an element showed the greatest loss in forward gain. Mount a Yagi this way, only when you have no choice, but don't expect good performance.

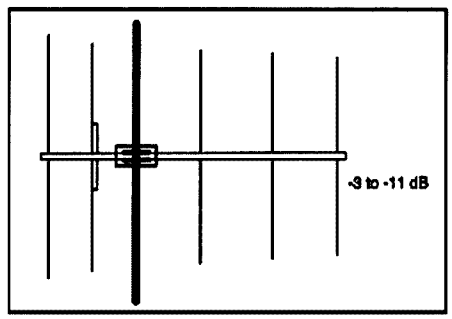


Figure 5. Mid mounting a Yagi

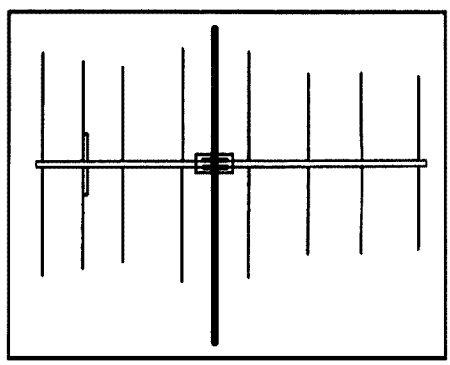


Figure 6. Electrical effects of a mast through a Yagi

It's not the mast itself, but the coupling effect to the Yagi elements that's the culprit. In a highly tuned Yagi, the element lengths are quite critical. The Yagi elements closest to the mast couple to the mast and are now much longer electrically, resulting in a Yagi that acts like the one shown in Figure 6. It should be possible to come up with a cut chart for a Yagi that says, " Trim elements 4 and 5, xx inches if vertically mounted through the mast".

What if you are going to be clever and use a non-conductive mast? A light antenna with a plastic or some expensive fibreglass rod can be used successfully.

continued on page 38

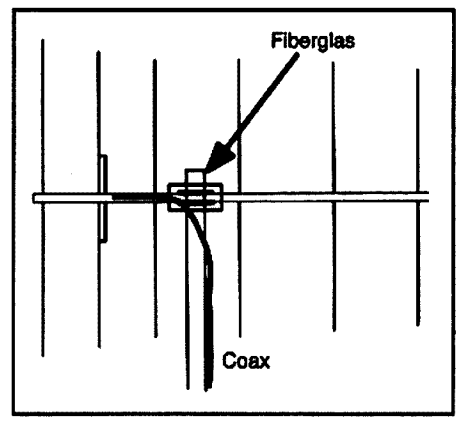


Figure 7. Using a nonconductive mast won't help if you run coax along it

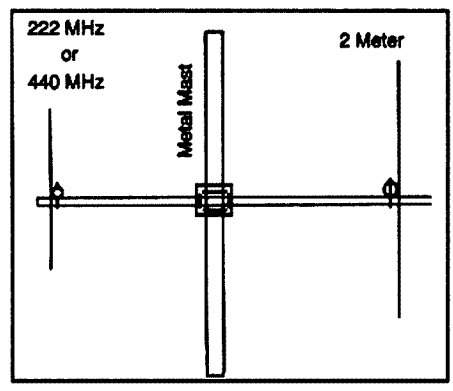
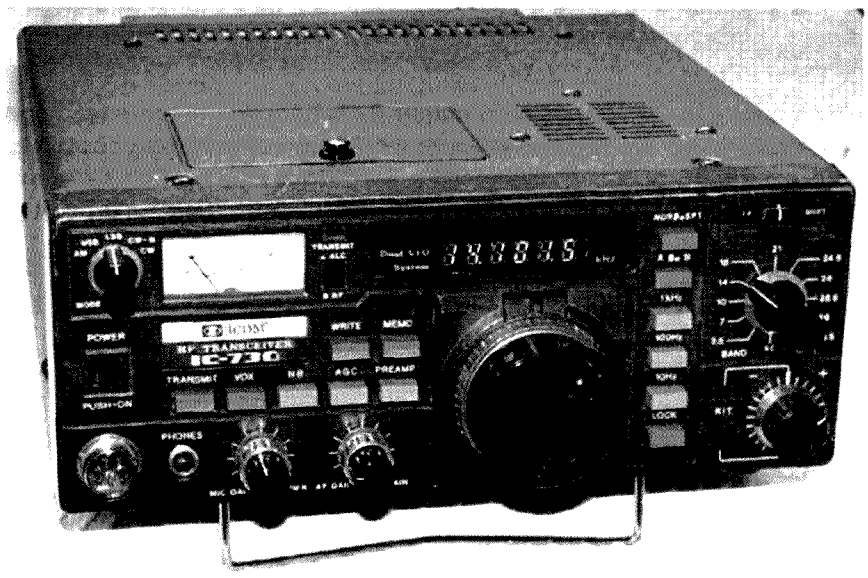


Figure 8. The best way to mount your vertically polarized Yagi(s) is by using an additional cross-boom to separate the antenna(s) from the mast

Ron Fisher VK3OM

The ICOM IC-730 HF transceiver

With comments on some other early Icom HF transceivers.



It's always nice to meet up with an old friend. In this case it is the Icom IC-730 transceiver. A few months ago I added one to my collection, and it brought back pleasant memories of an excellent rig I reviewed in *Amateur Radio* back in April 1982. It was about 23 years since I had seen and used one of these. It still stacks up surprisingly well

Icom equipment has always been different. Right from the earliest they have used fully synthesised frequency generation while other manufacturers were getting along with analogue VFOs. The first Icom was the IC-701, a marvel of electronic engineering, fully synthesised with an electric driven band switch. Most of them worked well, but a few suffered problems, probably due to poor quality control. Also, that electric motor driven band-switch gave problems after a few years of operation. Take care if you are tempted to purchase one.

The 701 was superseded by the IC-720, closely related to the 701 but with a full general coverage receiver. It still used a motor driven band-switch. By this time quality control had improved and it's still possible to hear a few on the amateur bands. Some sound good, others don't. Again, take care if you are tempted to buy one, but then this applies to any second-hand purchase.

The IC-730 was released on the local market in mid 1981, when quality control problems had been taken care of. My 730 has been serviced only once by Icom, back in 1991, for a minor problem. Since then it has been in continuous service, mainly on 20 metres. It is still performing right up to specifications.

A closer look at the IC-730

Let's look at the 730 in detail and see what it has to offer and how it compares with other contemporary transceivers.

There are two synthesised VFOs. Tuning speeds are selectable at 10 Hz, 100 Hz and 1 kHz steps, giving a tuning rate per knob revolution of 1 kHz, 10 kHz and 100 kHz. The two VFOs allow split frequency operation, although it is confined to the band in use. Still, most useful.

Next there is a memory. Just one, but as far as I know, the first on an HF transceiver. Actually, there is one on each band so it's better than you might think. We have come a long way, with 100 memories now being common.

With no mechanical gearing, the tuning is very smooth and free. Tension is adjustable if required. Band switching is now with a normal switch bank; the old motor driven switch is gone forever. A speech processor is included, as is an SWR meter. Very handy.

The rig covers all bands from 80 to 10 metres in switched 500 kHz segments. Unfortunately, as was common at that time, 160 metres was omitted. However, in addition to USB, LSB and CW, a useful AM facility is included with a proper AM 6 kHz filter. This produces excellent AM quality on both transmit and receive. Power output on SSB and CW is 100 watts with about a quarter of this on AM from the solid state final.

The IC-730 on the air

The general performance on air was excellent. One of the main advantages over its opposition was the great improvement in frequency stability. While it's probably not up to a new transceiver with a TCXO, I didn't notice any frequency drift that was in any way distracting. Compare that with other transceivers reviewed in this series.

The frequency display reads to 100 Hz and is bright and easy to see; however, with the RIT in use, it doesn't change its reading. A bit odd, but you get used to it.

An IF shift control is useful in reducing interference and can be changed to a band pass tuning system with the addition of an optional filter. I doubt that many original purchasers would have opted for this so you would be lucky to find one.

Last, but not least, the 730 has an excellent VOX. Listening around, I don't think many use VOX these days but it's there if you do.

A second hand IC-730 is fairly rare today. Perhaps they weren't popular when they came out, or perhaps those who have them hang on to them. The official Icom price on 14/1/1982 was a rather high $969. Today, I would value one at around $350. This should include an IC-HM7 microphone, a DC power lead and, of course, an instruction manual. It should be in clean condition.

The matching power supply was the IC-PS15, and the speaker the IC-SP3. PS15 power supplies are often in the second hand market, but SP3 speakers are seen more in 'wanted' than 'for sale'. A narrow CW filter was also available.

Next in this series I will be looking at RF power and SWR meters and misconceptions regarding them.

ar

Equipment review

Yaesu FT-857D, all mode, HF, VHF, UHF mobile transceiver

Eric Buggee VK3AX
Ron Fisher VK3OM

After a long gap, Amateur Radio magazine is back in the business of presenting reviews of new amateur radio equipment. We hope to present a selection of reviews of both transceivers and ancillary equipment on a regular basis. I am also very pleased to introduce a new member to our team, Eric Buggee VK3AX. Eric is well known to 160 metre operators. This is Eric's favourite band and he puts out a booming signal from his Emerald location which just happens to be up the road from me. He is also a "test equipment" afficionado. This means that if something is quoted as being -70 dB down, it isn't -71 dB down. Eric will, therefore, be doing all the technical tests. Over time you will be able to make exact comparisons between the gear we review. So let's get underway.

The Yaesu FT-857D is a super compact HF, VHF, and UHF transceiver. It operates all modes right up to 70 cm. SSB, CW and FM power output is 100 watts from 160 through to 6 metres. This drops to 50 watts on 2 metres and 20 watts on 70 cm. Power output using AM is a quarter of the above figures. Yaesu claim that the FT857D is the smallest transceiver in its class. Our measurements indeed show that this is so, but not by as much as you might imagine. The Yaesu measures 1,878 cubic cm while its nearest rival (you guess) is 1,937.2 cubic cm. Again, the Yaesu is lighter than its rival by .35 kg.

The FT-857D is the latest Yaesu in a long line of compact multi band transceivers which started several years ago with the FT100. We might even go back further to the original FTDX-100 which was quite a sensation in the late 1960s. This was all solid state, except for the final and driver stages which were tubes and this preceded the famous FT-101 series. I must admit that I was very tempted to purchase an FT-100 when they first came out, but was put off by the very odd DC power connector that was supplied. I have not seen one similar either before or since. However, the FT857D now comes with a standard six pin DC connector found on just about every other Japanese transceiver in the 100 watt output range. I guess they had a few complaints about that connector.

Photo 1 – The FT-857D and hand microphone.

Eric Buggee VK3AX tests the most compact transceiver of its type and finds it exceeds expectations.

The FT-857D is actually derived from the FT-817, that midget marvel much loved by QRP enthusiasts. Another derivation is the larger FT-897D. The 'D' indicates that it is an upgrade from the earlier FT-857. The new 'D' model now includes the previously optional DSP circuitry, as well as including operation on the 60 metre band, available in the US but, as yet, not allocated in Australia.

Of course, the usual features are included, such as a remotable front panel, and two antenna connectors, one for HF and six metres, the other for VHF and UHF. Let's look at the first of these. I don't believe that the remote front panel is implemented as well as some of the opposition. The connecting cable uses those cheap and nasty (in my opinion) plastic telephone plugs. A short one is included to connect the panel and main transceiver when they are normally used together. A longer separation cable is available as an option and it seems that an extension cable would also be needed for the microphone but, unfortunately, the remote kit was not supplied to us for evaluation. An extension speaker can be plugged into the front panel via a 3.5mm jack. This is switchable for either headphones or speaker.

Being of super compact size, the FT-857D is controlled by a 'menu' system. If you are still back in the dark ages, and using a transceiver with a separate control for every function (nothing against that), you will be in for a steep learning curve. However, the instruction manual is very straight forward and you

should soon sort things out. Basically, there are two menu systems.

Firstly, the 'set and forget' functions that you will set up initially and then probably not need again for a long time. Secondly, the menu functions that you will use in everyday operation of the radio. There are ninety one items in the first section and I would suggest that most of these can be left in their default positions, certainly in the short term.

The FT-857D on the air

Straight out of the box, I was surprised how hard it was to fit the remotable front panel to the main body. It took quite a solid hit to get it in place. I guess that, with practice, it might come easier. Navigating around the front panel is also rather hard. The designations for the various controls are small and many are hidden either on the side or top of the panel. Well, I guess that you can't have the most compact transceiver of its type and large labels. However, I get the impression that the earlier FT-100,

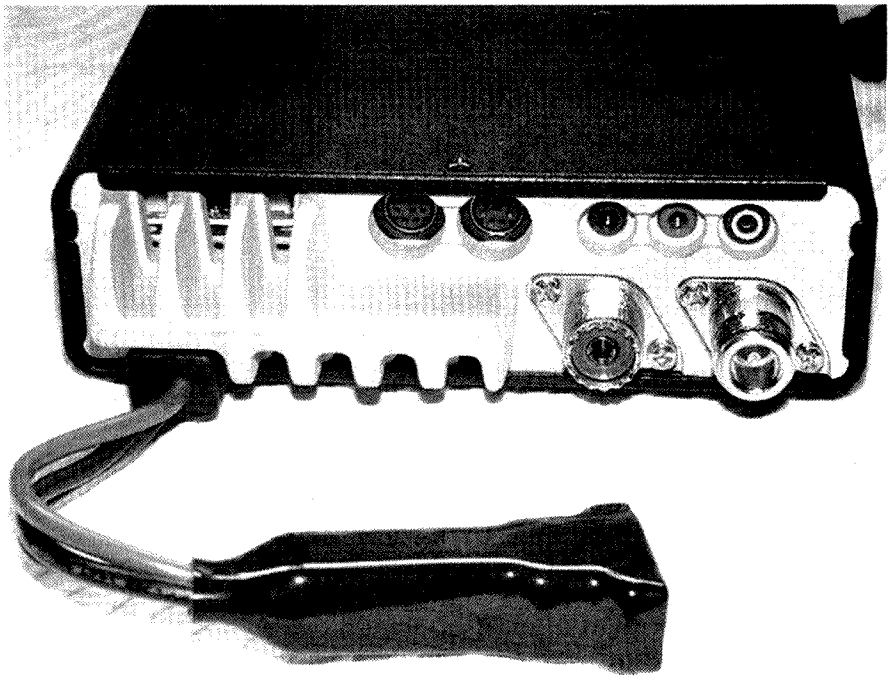


Photo 2 – The rear panel of the FT-857D and the power cable and socket.

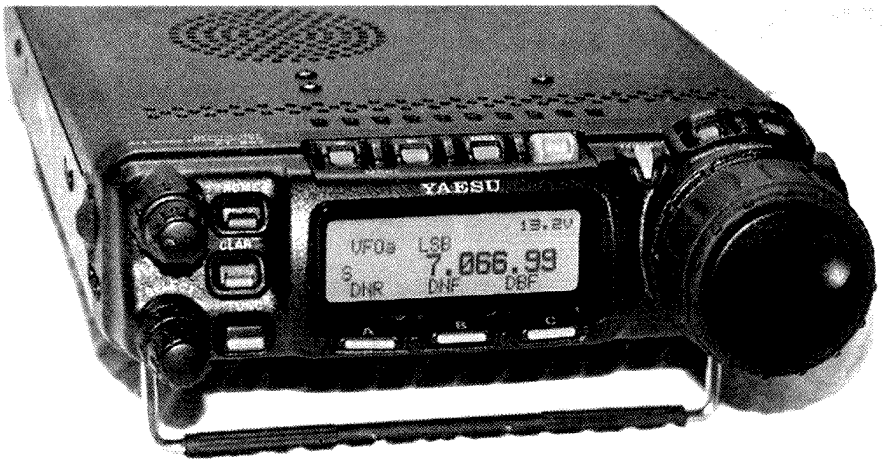


Photo 3 – A closer look at the FT-857D front panel.

although slightly bigger, has a much better panel layout. It also has a much larger display.

Once on the air, the FT-857D starts to show up its good points. The tuning knob, which dominates the panel, is smooth in operation. Two tuning speeds are selectable via the menu, fine or coarse. Fine gives 10 Hz tuning steps, coarse 20 Hz steps. Ten Hz steps give a rate of 2 kHz per knob revolution with the 20 Hz giving double this. 100 Hz steps are available for really fast tuning by giving the on/off power switch a very quick push.

Received audio was satisfactory on the small internal speaker but I thought the low frequency response was slightly lacking when using my normal external speaker, an Icom SP3. I rather liked the 'S' meter. This is, of course, part of the LCD display and, while being rather small, actually shows the reading in figures as well as the bargraph indication.

Transmit audio on SSB is rated as good. The audio can be enhanced in three ways. Firstly there is the speech processor with control via the menu to set the amount of compression. Secondly, the carrier point can be adjusted +/-300 Hz to set a desired high/low response balance; and finally there is a DSP microphone equalisation which selects low frequency emphasis, high frequency emphasis or mid frequency emphasis. With all of these you can produce transmit audio just about any way you prefer.

Looking at the CW facilities, one thing that intrigued me was the CW training program. This will send to you random Morse at any chosen speed in five character groups. Straight after this, it prints out the characters on the screen. A great opportunity to brush up your code. Try it, you'll like it. Of course, there are plenty of features for the real CW operator, including a built in electronic keyer. This can even be programmed to operate from the up/down buttons on the microphone if you forgot to pack the key before leaving on that DXpedition.

Talking about CW, I noted that Peter Forbes VK3QI reported recently in AR that an FT-100 outperformed other transceivers on CW during one of his IOTA expeditions. It was fitted with an optional 500 Hz filter. Look carefully at the FT-857D if you are a CW fanatic, it could well outperform some more expensive transceivers. One other feature worth mentioning is the display colour. You have a choice of 32 variations. It's possible to have a different colour for each band, each mode or anything else you can think of. I must admit that none of the colours really turned me on. I guess I must be hard to please. The FT-857 excels in the memory department. There are over two hundred memories which should be enough to cover all requirements

The FT-857D technical tests

These were carried out by Eric Buggee. Eric says that the results he found far exceeded his expectations. In fact, the figures were better than many transceivers costing nearly double the price. Eric says he might just have to buy one.

ar

Note from the Editor.

We will be reviewing other amateur equipment. The reviews are the reviewer's reaction to use of the equipment. They are not infomercials. Suppliers of the equipment will be supplied with a copy of the review and provided space to make further comment.

Comment from Yaesu distributor on the review

1. The front panel of the transceiver is NOT more difficult to fit to the main body of the transceiver, when compared to most current model remote able front panel transceivers. This is blatantly misleading.
2. There is no mention of the large VFO tuning knob, which is quite a desirable feature, as it allows very smooth and accurate VFO tuning.
3 The transmit audio can be tailored.
4 ".....the reviewer seems to have missed a major point in that the radio can be operated in THREE DSP receive modes simultaneously, ie. Digital Noise Reduction, Digital bandwidth tuning (or something like that) and Digital notch tuning (or something like that) to improve its receive performance in arduous conditions. "
5. The 10dB received S/N results per band are NOT clearly presented at all. I find them difficult to understand and I've read hundreds of radio specification sheets, including ones up to radio engineering level.
6 Usually, the dynamic range of a receiver is greater when its receive preamp is switched OFF, not ON. Using a receive preamp often increases the received signal compression effect (read; non-linearity), which in turn reduces the receiver's dynamic range. A receive preamp usually increases cross-modulation, intermodulation and blocking effects, which is detrimental to a receiver's performance.

These comments are mainly from one of our dealer, however we do agree with him in most of his observations.

David Benchoam, Benelec

Product Review: YAESU- FT857D

Serial No 4J10163

Manufacturers Claimed Specifications.

Measured By VK 3AX
Receive (1) and Transmit as specified.

Frequency Coverage: Receive. 0.1-58, 76-108, 118-164, 420-470 MHz; Transmit: 1.8-2, 3.6-4, 7-7.3, 10.1-10.15, 14-14.35, 18.068-18.168, 21-21.45, 24.89-24.99, 28-29.7, 50-54, 144-148, 430-450 MHz .

Power Requirement: Receive, 1.0A; Transmit: 22A (@100 W output)

Modes of Operation: SSB, CW, AM, FM, & Data.

RECEIVER

SSB/CW sensitivity, Bandwidth not Specified, 10 dBS/B: 1.8-30 MHz, <0.2 µV; 50-54, 0.13 µV, 144-148, 430-450 MHz, ,0.13 pV.

Receiver Dynamic Testing
Noise Floor (MDS), SSB Flt.

	Pre-Amp Off	Pre-Amp On
1.0 MHz	-128 dBm	-134 dBm.
1.8 MHz	-129 dBm	-134 dBm
3.6 MHz	-130 dBm	-134 dBm
7.0 MHz	-131dBm	-137 dBm
10 MHz	-133 dBm	-137 dBm
21 MHz	-134 dBm	-138 dBm
24.9 MHz	–134 dBm	-138 dBm
28 MHz	-134 dBm	-138 dBm
60 MHz	-35 dBm	-139 dBm
144 MHz,	(see note 2)	-140 dBm
440 MHz	(see note 2)	-139 dBm

AM sensitivity (Std Bandwidth), 10dB S/N: 0.1 - 1.8 MHz, <32 µV, 1.8 – 30 MHz, < 2 µV; 50-54 MHz, <1 µV; 144-148 MHz, 430-450 MHz, <0.2 pV.

10 dB (s+N0/N, 1 kHz Tone, 30% Mod

1.0 MHz	4.46 µV	1.9 µV
1.85 MHz	2.66 µV	1.3 µV
3.6 MHz	2.5 µV	1.1 µV
50 MHz	1.7 µV	0.7 µV
144 MHz	(see note2)	0.6 µV
440 MHz	(see note 2)	0.62 µV

FM Sensitivity, 12 dB SINAD; 28-30 MHz <0.5 µV, 50-54 MHz, 144-148, 430-450 MHz <0.2 µV.

0.6 µV		0.26 µV
0.42 µV		0.2 pV
146 MHz	(see note 2)	0.18 µV
440 MHz	(see note 2)	0.19 µV

Blocking Dynamic Range: Not Specified.

Blocking Dynamic Range (SSB)
Specing: 20 kHz

Pre-Amp	On	Off
3.5 MHz	107 dB	104 dB
14 MHz	107 dB	103 dB
50 MHz	106 dB	100 dB
144 MHz	(see note 2)	100 dB
440 MHz	(see note 2)	94 dB

Two-Tone, Third Order IMD dynamic range Not Specified.

Two-tone 3rd Order IMD dynamic range
Spacing 20 kHz

Pre-Amp:	Off	On
3.5 MHz	88	87 dB
14 MHz	88	85 dB
50 MHz	88	83 dB
144 MHz	(note 2)	82 dB
432 MHz	(note 2)	83 dB

Third-order Intercept: Not specified.

Spacing 20 kHz

Pre-Amp:	Off	On
3.5 MHz	+7.5	+0 dBm
14 MHz	+2.0	-7.3 dBm
50 MHz	-2.0	-9.0 dBm
144 MHz	(note2)	-10.6 dBm
440 MHz	(note 2)	–8.5 dBm

FM: adjacent channel rejection not specified

20 kHz channel spacing, Pre-Amp on.
29 MHz, 65 dB; 62 MHz, 62 dB; 146 MHz, 65 dB; 440 MHz, 58 dB.

FM: two-tone, third order IMD dynamic range. not specified.

20 kHz channel spacing, Pre-Amp-On.
29 MHz, 63dB; 62MHz, 62dB; 146 MHz, 60 dB; 440 MHz, 58dB.

S-meter sensitivity; (SSB) Not specified. S9: Signal @

Pre-Amp	Off	On
1.85 MHz	80 pV	30 µV
3.6 MHz	92 pV	36 µV
7.1 MHz	80 pV	33 µV
10.1 MHz	84 pV	32 µV
14.2 MHz	65 µV	25 µV
18.1 MHz	60 pV	22 µV
21.5 MHz	58 pV	22 µV
24.9 MHz	62 pV	22 µV
28.5 MHz	80 µV	22 µV
52 MHz	45 µV	15 µV
144 MHz, SSB (see note)		10 µV
146 MHz, FM (see note)		3.2 µV
432 MHz, SSB (see note)		9.1 µV
440 MHz, FM (see note)		3.3 µV

Squelch sensitivity: SSB,1.8-30 MHz, 2.5 µV; 50-54 MHz, < 1.0 µV, 144 / 440 MHz, <0.5 µV; FM, 28-30 MHz, < 0.32 µV; 50-54 MHz, 144-148, 430-450 MHz, <0.16 pV.

At threshold, Pre-Amp On: SSB, 14 MHz, 1.99 µV; FM, 29 MHz, 0.15 µV; 52 MHz, 0.1 pV; 146 MHz 0.075 µV; 440 MHz, 0.1 µV.

Rx Audio Output; 2.5 W @ 10% THD into 4 Ohm..

Measured 3.0 W @ 10% into 4 Ohm

Transmitter.

Transmitter

Power output: HF , 50 MHz.; SSB, CW, FM,100W;

Dynamic tests; HF, 50 MHz; AM, 25 W (carrier); 144 MHz, SSB, CW, FM, 50 W; typically 97 high, 7 W low;

AM, 12.5 W (carrier); 430 MHz, SSB, CW, FM, 20 W,

AM, typically 23 W high, 1.5

AM, 5 W.

W low; 144 MHz, CW, SSB, FM, typically 45 W high, 1.5 W low; 430 MHz; CW, SSB, FM, typically 16 W high, 1.5 W low; AM typically 3.5 W high, 0.7 W low.

Spurious signal & Harmonic suppression; >50 dB on HF; > 60 dB on VHF & UHF

HF, >50 dB, 50 MHz, >60 dB; 144 MHz, >60 dB, 430 MHz >60 dB.

SSB carrier suppression; >40 dB.

>50 dB.

Unwanted sideband suppression.

>50 dB.

Third-order intermodulation distortion products; Not specified.

App –25 dB wrt fundamental. 5th order, approx -40 dB.

Test Equipment used: Rohde &Schwarz CMT 52 & CMT 54.
Bird 43 wattmeter & Bird 8164 terminating wattmeter / load.
Marconi TF 893A Audio load / Wattmeter.

This transceiver performs extremely well as the above figures show. Its very small size can be both an advantage and a disadvantage. In the latter case, the small front panel with its hard to read labelling and the small size of the display might go against it. On the other hand, these very things might well appeal to others. Either way, the performance is excellent.

Our transceiver was supplied to us by Benelec. Details of the FT857D and all other Yaesu equipment can be found on the Benelec web site at www.benelec.com.au

Check the advertisements in the current AR for prices.

ar

Amateur Radio

Reports to WIA 2005 Annual General Meeting

Fellow Directors, Members, Wireless Institute of Australia.
It is my pleasure to report on the three areas of my portfolio. They are;

- *Amateur Radio* Magazine
- The 2005 Callbook.
- Affiliated clubs.

In this report I will acknowledge the efforts of the many willing volunteers, highlight the events of the past year and point to the way forward. Statistics are below.

Amateur Radio Magazine

The only place to start is to acknowledge and applaud the tireless work of the Editor, Colwyn Low and all members of the publications committee. I should also thank John Nieman from Newsletters Unlimited for his willing help and support. It has been a rapid learning experience made much easier by his help.

One of the greatest challenges has been keeping up with the many changes in the WIA. No easy task when states progress at different rates and even the smallest change starts a chain of events. I believe we are now close to having it right but corrections and supportive comments are always welcome.

By now members should have noticed some real improvements in the presentation of A.R. This is due to the constant detailed attention of the proof readers in the publications committee. I have been helping them to focus on an old/new strategy. If we can find fault, it is not good enough, so we do something to fix it.

Much of the Publications Committee's time is taken up in reshaping technical and general articles so that they can be published. The small number of regular writers has supplied enough material for around six months into the future but we can always do with more. New writers are very welcome, though I ask all first timers to check page 1 of AR and contact the appropriate Editor, before the article is written. This can save the writer and Editor a lot of time and rework. Naturally it also means the article can be ready to publish much quicker.

The statistics show the high annual cost of AR. This, and the iconic status of the magazine will be very much in mind as we strive for ongoing improvements.

2005 Callbook

I must propose a vote of thanks to Brenda Edmonds who almost single handedly coordinated preparation of the 2005 Call book. Many thanks also to John Martin and other contributors who must have spent countless hours checking the myriad of detail.

Each year we are faced with the same problem. What IS the Callbook?

Only around 60% is the listing of Australian call signs. The rest is, an introduction to the WIA, an overview of ACA information, a technical resource for repeaters, beacons and band plans, and much more. We often receive suggestions that it should also have".....", so we have to weigh up what to include and what to leave out.

The most difficult task is getting accurate information. In recent issues of AR, we have asked contributors to update their areas of interest and prepare for input. Likewise with individual call sign details. The cut off date to ACA is around 30 June 2005.

Anyone observing errors is asked to advise us via callbook@wia.org.au

Distribution of the 2005 callbook via clubs was successful with only a few problems due to crossed wires. It is likely that the 2006 Callbook will be distributed in the same way. Any clubs organizing events after 1 September 2005 are asked to place advance orders with National Office by September 1st.

The call book is both a service and business activity. In future editions economics and content are both key factors to be considered.

WIA President, Michael Owen, VK3KI opens the WIA AGM at the Italo Australian Club, Canberra on 7 May 2005 in front of the new WIA amateur radio posters. Sitting are from left, are WIA directors Phil Wait, VK2DKN, Robert Broomhead VK3KRB, Michael, Treasurer David Pilley, VK2AYD and Vice President, Ewan McLeod, VK4ERM.

Affiliated clubs

The driving force behind building up the WIA – Clubs relationship has been Michael Owen. Without Michael's efforts in visiting and speaking to clubs, many would be thinking "What WIA" instead of "Our WIA". My part in working with the clubs has been and still is, making contact and updating the information necessary for the WIA to communicate effectively with all affiliated clubs.

The clubs listing at www.wia.org.au is now close to complete. It is not 100% and we need active monitoring and input from all clubs. If the details of your club are missing or incorrect, please use the update form on the clubs page.

An important issue at the moment is "Affiliation". As of 16 May 2004 all clubs known to be previously affiliated with their Divisions, were considered to be "Provisionally" affiliated so as to ensure that continuity was maintained for them.

In December 2004 the President sent to all listed clubs, an invitation to formalize affiliation and join in the insurance policy. So far, out of 136 known clubs only 49 have taken up affiliation and a smaller number the insurance.

What I don't know is how many clubs actually received the President's invitation. A copy can be supplied to any club that did not receive it by contacting nationaloffice@wia.org.au .

With the new Foundation Licence coming very soon, along with major changes to the exam process, it is very important that the WIA knows how to contact all clubs that want to be involved.

I have now found that there are at least 15 clubs listed as conducting exams but they are not known as affiliated clubs.

Ted Thrift VK2ARA
Director

Report from the Editor

This is my sixth year as Editor and the magazine is still able to maintain a good standard. This is not due to my efforts but to the authors of the technical articles, the general articles and the regular columns. The regular columnists provide about half the magazine each month and their contribution shows the breadth of amateur radio as a hobby in Australia. We would not have a magazine without them. Thanks to you all.

When I took over from Bill Rice in 2000 articles were just ahead of the publication needs and if it had not been for Drew Diamond VK3XU and Peter Parker VK3YE there would have been little technical content. Today we still have a steady flow of articles from Drew but with contributions from Dale Hughes VK2DSH, Jim Tregellas VK5JST, Keith Gooley VK5OQ and many others I am now able to think about what goes with what in a particular issue.

I do not seem to get too many brickbats so the magazine must have a good balance. However there is still not much on microwaves and digital modes submitted to AR.

It was pleasing during the year to be asked by the RSGB to use material from AR in a new book on aerials and have requests from other overseas magazines to reprint material from AR.

The magazine is produced by the Publications Committee and the Editor. The Publications Committee meets monthly to review material submitted to AR, allocate vetting officers and review the last available issue of AR. This is to make sure we keep the standards as high as possible. While everyone works hard, special thanks are due to Bill Roper VK3BR, secretary of the Publications Committee. He receives and distributes articles as they are submitted. Bill also prepares the final diagrams to the magazine's standard. He keeps the files of articles being vetted and those available for production.

Finally we need to record our continuing reliance on Gill Nieman who does all the setting up of the magazine for printing. All credit for the layout is hers, so while I determine the content, Gill sets it up to be eyecatching and easy to read. John Nieman looks after the advertising and the distribution. Since we placed AR on the newsstands we make a small profit to help with production costs. We are selling a slowly increasing number of magazines each month.

So all in all we have had a good year. It has been pleasing to have Ted Thrift VK2ARA Director and Michael Owen VK3KI President attend most of the Publication Committee meetings.

Colwyn Low VK5UE
Editor

ar

Opinion

Is the Remembrance Day Contest dying?

Vince Henderson VK7VH

Opinion on the future viability of the Remembrance Day Contest seems to have gathered momentum. There are some that would oppose any change to the contest. Some feel we need to make changes in order to increase the level of participation. There are also others that predict the demise of the contest if it remains in its current form. It is certain that the contest is in decline.

The situation could be summed up by looking at the possibilities for the future:

1. Do nothing and leave the contest as it is.
2. Let things roll along and if the contest folds, then so be it.
3. Make drastic changes to the contest format.
4. Make some subtle changes based on a long term strategy that evolves with the needs of contest participants.

There is no doubt that the level of participation has waned over the years. You only need to look at the history of the event results to see the rate of decline. It is time for a rethink. While I do not profess to have a magic pill, I do have a few ideas.

I feel that many people would agree that the RD Contest needs a shot in the arm. However, where do we start? What if change gets people offside? In the end, we need to consider the long term future of the contest. With that foremost in our minds, we should move towards revamping the contest, starting in 2006. I personally favour point 4 above. Let's have a look at what we could do.

Have two time sections

There are a number of options available. The contest could be split into a 24 hour section and two 12 hour sections. Let's say that the 12 hour sections are divided by running the first 12 hour section from 0800 UTC (6.00pm EST) until 1959 UTC (5.59am EST) and the second section from 2000 UTC (6.00am) until 0759 UTC (6.00pm EST). This would open up some possible changes.

- All operators could enter the full 24 hours or just 12 hours. However, if contacts are made in both 12 hour sections, the entry must then be considered a 24 hour entry.
- The current rule for VHF allows repeat contacts every 2 hours. With two 12 hour sections, HF operators entering the full 24 hours could be allowed a repeat contact during the second 12 hour section.

The extra section may attract people who would not normally have a real go at the contest due to other commitments. A change to HF operators being allowed a repeat contact during the second 12 hour section should see some interesting strategies, not to mention the appeal of a different challenge.

Redefine the modes

The current modes are Transmitting Phone (AM, FM, SSB, TV) and Transmitting CW. There is no doubt that the digital revolution is with us. New methods of transmitting and receiving are being developed and have captured the imagination of hams all over the world. Why not introduce a third allowable mode? Consider the following suggestion:

- Transmitting Phone to be retained and only voice transmissions are allowed via AM, FM, SSB and TV.
- Transmitting CW to be retained. Change the current scoring from 2 points per contact to 1 point per contact.
- Introduce Transmitting Digital. 1 point per contact.

But why reduce CW contacts to 1 point? Well, in my humble opinion, this would put CW point scoring on an equal footing with all other modes and encourage people to enter Transmitting Digital.

What types of digital modes are allowed will probably need development over time. Maybe a starting point would be to allow PSK31, RTTY, MT63 or even digital/analog SSTV.

Allow more diverse entries

The present entry categories for HF and VHF are:

a) Transmitting Phone
b) Transmitting CW
c) Transmitting Open (a combination of Phone and CW)

The majority of entries for the 2004 event were HF and VHF Phone. There were only 14 HF open entries and only 6 VHF open entries. While HF CW continues to have reasonable support, there were no VHF CW entries. One way that may assist with increased VHF Open entries and indeed HF Open entries, is to allow the following entry categories for HF and VHF:

a) Transmitting Phone
b) Transmitting CW
c) Transmitting Digital
d) Transmitting Open. A combination of a) + b), a) + c) or b) + c).

Allowance could also be made for separate entries for each category.

A simple increase in entry options may be one way of getting people to look at the RD Contest in a new light. The addition of digital modes may encourage some who have not used these modes to at least consider adding to the way they enjoy amateur radio, and add flavour to the RD Contest.

Recognition for effort

"What on earth is he talking about?" I hear you say. The present licensing arrangements are about to change. Why not give recognition to the top VK entries that hold a call other than unrestricted.

- Issue a certificate to the top VK intermediate licence holder (all categories).
- Issue a certificate to the top VK

foundation licence holder (all categories).

- Where applicable, do the same in ZL and P2.

The power and band limitations for intermediate and foundation licensees, make it difficult to compete with big gun unrestricted licence holders. Recognition for having the top score in the country, for your licence class, is something worth aiming for.

While the above suggestions may not get a start in the 2006 event, we should have a plan that allows for future fine tuning of the event. If a change is made and found to be unpopular, we need courage to keep trying alternatives.

It is a balancing act to keep everyone happy. Good planning will usually overcome difficulties. It is no use saying, "ah well that doesn't work, what will we do now?" If changes are made to the contest, contingency plans are a must.

The job of Contest Manager is no easy task. After eleven years as the Remembrance Day Contest Coordinator, Alek VK6APK, is retiring. I am sure that all VK, ZL and P2 amateurs will join me in offering our profound gratitude for Alek's dedication to the enormous task of contest coordinator. Bravo Alek.

The management of the RD Contest has been taken up by Chris VK4AA. We wish Chris well in his new role. I am sure he will welcome any suggestions on how to improve the RD Contest. I encourage all readers to write with their ideas.

In closing I would like to raise one final suggestion. Research shows that seventy five percent of amateurs have a computer. Maybe it is time for the WIA to look at having a contest robot program that will allow entry logs to all WIA sponsored contests to be emailed. The ARRL made a move in this direction a number of years ago. Many countries are now following suit. In fact, most major contests will only accept logs of fifty contacts or more in Cabrillo format, via email.

The benefits of computerised log submissions are many. Entrants receive an immediate email confirming their log has been received. If there is a problem, the contest robot will email the entrant with details of what the problem is. The greatest advantage is that the contest manager's job is made easier as the contest robot program cross-checks and validates the log entries automatically.

The robot program would generate accurate results able to be published a short time after the closing date.

Movement to this type of log management would at least ease my mind a little as my suggestions would mean an increase in the number of certificates awarded because of the expansion of RD Contest categories. Issuing of certificates is managed by the contest coordinator and without software management of log submissions; the work load would increase dramatically.

I do not claim to have definitive answers as to how we can spice up the RD Contest. What I do know is that we need to act now and make some changes in order to increase the participation and enjoyment of this great event.

Happy contesting and I hope to work you in the 2005 Remembrance Day Contest.

ar

News from...

VK2

Compiled by Chris Davery VK2XCD
President Amateur Radio NSW,
and Tim Mills VK2ZTM.

The AGM of the Amateur Radio NSW (the old NSW Division) was held at Amateur Radio House on Saturday 17th April.

For the first time in many years there were eleven nominations for the nine Council positions, and a ballot was required. The 2005/6 Council consists of Mark Blackmore VK2XOF, Chris Devery VK2XCD, Chris Flak VK2QV, Owen Holmwood VK2AEJ, Brian Kelly VK2WBK, Noel May VK2YXM, Norm Partridge VK2TOP, Terry Ryeland VK2UX and Barry White VK2AAB.

At the first meeting of the new council, office holders were elected and portfolios allocated. Positions are Chris Devery VK2XCD, President and Publicity; Norm Partridge VK2TOP, Senior Vice President, Clubs, Membership and QSL Liaison; Terry Ryeland VK2UX, Junior Vice President and Education; Owen Holmwood VK2AEJ, Secretary and Public Officer; Noel May VK2YXM, Treasurer; Mark Blackmore VK2XOF, Deceased Estates, Trash and Treasure and Dural Officer; Brian Kelly VK2WBK, NTAC; and Chris Flak VK2QV, Bookshop and Web Master.

The new council will be seeking to meet with the WIA to consider the QSL Bureau, the bookshop, broadcasts and other issues, in the spirit of the implementation agreement entered into between the WIA and the old divisions. As President it is my intention to establish a harmonious and co-operative relationship between Amateur Radio NSW and the WIA, with the focus of the relationship being on what is in the best interests of the hobby of amateur radio.

One of the most significant issues facing NSW is the decline in membership following the establishment of the national WIA. Approximately 50 per cent of members have been lost, with a somewhat larger loss of members in country areas. The critical period for us will be in June and July, when members will be considering whether to renew their membership of Amateur Radio NSW under the new structure. If you have not renewed your membership of Amateur Radio NSW, or are thinking about not renewing, and have an interest in the future of the organisation, please consider renewing or re-joining so that you can have your say.

It was refreshing to attend the AGM of the WIA in Canberra, and witness an entire meeting focussed on significant matters facing the hobby and its future. Debate was lively and constructive and the format of the meeting provided a useful opportunity for members present to provide feedback to the directors on a wide range of issues.

One of the significant functions of Amateur Radio NSW has always been the management of deceased estates. Most importantly, this is a service to the families of silent keys, relieving them of the burden of dealing with equipment, and ensuring that appropriate values are realised for gear. Council has decided to make use of the web site to display and itemise major items being offered by the Deceased Estates and Trash and Treasure section. Members will have the first opportunity to tender for equipment, subject to a reserve price. Smaller and less significant items will continue to be offered at the monthly trash and treasure. The weekly VK2WI news sessions and internet site will advise when this new system will commence.

The Parramatta office is currently open on Tuesdays, Thursdays and Fridays, 11 am to 2 pm. The hours of paid staff have been reduced to assist council to balance the budget this year, and volunteers who wish to assist will be very welcome. Contact methods are telephone 02 9689 2417; freecall 1 800 817 644; fax 02 9633 1525;

Mail to PO Box 9432 Harris Park 2150; email vk2wi@ozemail.com.au ;

Street address, 109 Wigram Street, Parramatta.

The Blue Mountains Amateur Radio Club

will be holding

WINTERFEST 2005

on

Saturday August 27 2005

at the

1st Blaxland Scout Hall, Reading Street, Glenbrook NSW.

Please note that the date for WINTERFEST 2005 has changed from the previously advertised date.

Last year was a very successful event with over 100 attendees, including sellers. This year we hope to have several of the major amateur radio equipment suppliers represented.

So come along and enjoy the fresh mountain air and the bargains on offer at

WINTERFEST 2005.

John Watt VK2QN
Blue Mountains Amateur Radio Club Inc
Public Officer

Silent key

SJ Hutchison VK2FFF
Mona Vale NSW

VK4

From Alistair Elrick VK4MV

Townsville, the Convention City

The Far North and North Queensland Amateur Radio Get-Together FNNQARG!

The date is Friday, June 10th to Monday June 13th at King Reef Resort Kurrimine Beach. All accommodation at Kurrimine Beach has been booked out. Source accommodation (within a 25km radius) at El Arish, Mourilyan, Mission Beach, Innisfail or Tully. vk4wit@wia.org.au or http://www.vk4tub.org/tarc/

The FNNQARG! Raffle is a Magellan Explorist 100 14-channel portable GPS Receiver donated by Navcom Electronics.

News of Convention!

North Queensland Amateur Radio Convention September information pack is on the WEB at the TARC website. The pack contains info on venues and costs and includes the registration form required to access catered events held during the Convention. http://www.vk4tub.org/tarc/convention.htm

Getting together socially

That recent get together which was organised by Sunshine Coast and Dalby Amateur Radio Clubs at Somerset Dam went ahead and according to all who attended "it went very well." In excess of 40 adults plus kids from 9 radio interest groups! Redcliffe, Bayside, Caboolture, Summerland, Lockyer Valley, Kilo Romeo, Albatross Radio Club, Dalby and the Sunshine Coast were all represented.

Trying hard not to be outdone by such a turnout, Bundaberg and Hervey Bay Amateur Radio Clubs held a very enjoyable B-B-Q and social outing with thirty three adults and five harmonics gathering at Burrum Heads for a beaut Queensland April day at the beach. It was Hervey Bay's turn this time to provide the steaks, sausages and onions while Bundy bought the bread rolls etc. Rusty tells us the next outing for these two Clubs will be organised by Bundaberg July 31.

South Coast Radio Amateurs Group

The South Coast Amateur Radio Group of around 60 mature Amateurs was formed some 3 years ago. As it is the third birthday of the group they have decided to combine the meeting on the 4th June with a BBQ etc, starting at 1200hrs at the home of Ken and Daphne in Nerang. Those wishing to attend please let Daphne know by 4th June, so that catering can be arranged. Club callsign VK4WIF Repeater VK4RBT 147.800.

WIA Members Verification Service for Queensland Clubs

Are you a Club Official and need to Verify? As part of the process to participate in the Wireless Institute of Australia through such things as Affiliation, Public Risk Insurance and the National Grants Scheme, clubs need to provide to WIA National Office data on the number of members who are also WIA members.

Most Clubs can do this via internal process however some Clubs have been making enquiries as to whether the WIA can help verify the number of WIA members in the Club. The WIA Queensland Advisory Committee can now help you via the WIA Members Verification Service for Queensland Clubs. Essentially, all Club Secretaries need to do - after of course making sure that all their constitutional and legal requirements plus members wishes are met, is to submit a list of Callsigns or WIA Short Wave Listener numbers to the service. This list will be compared with the WIA Membership List and the number of WIA Members will then be sent back.

Want to know more about the Verification Service including the Privacy Protocols? Contact the WIA Queensland Advisory Committee Secretary Ken Fuller VK4KF, either by mail to PO Box 199, Wavell Heights, QLD, 4812 vk4kf@wia.org.au or telephone 3901 1037.

Brief report on the contact between Albany Hills School and the ISS

The link-up on Wednesday evening between the students of Albany Hills School in Brisbane and astronaut John Phillips on the International Space Station was a copy book contact thanks to Mark, VK4AW.

Mark setup the phone patch at the school and the students' teacher Cheryl Capra did a brilliant job preparing the students. All the student questions were answered by John with a large spectator audience watching and listening in at Albany Hills. This was the first school contact that John Phillips has done and from an E-mail report that Tony, VK5ZAI received the following morning, said he was most impressed with the standard of the questions and how they were presented.

Clairview

By all accounts, well the one we did get!

From Clive VK4ACC, this weekend was "absolutely fabulous', Much hamming but also much time for relaxing. In fact the venue is VERY peaceful and relaxing. About 50 turned up for the weekend and in particular the U Beaut fund raising Auction on the Saturday evening. It was good to see people turn up from as far away as Brisbane, Townsville, Rockhampton, Mackay, Tieri, Dysart, Gladstone, Harvey Bay, Noosa and more.

Some arrived a day or two early some departed a day or two after. VK4MOO and VK4MAR were successful at fishing and crabbing. The quality of preloved goods for auction improved this year and so did the quantity. The fund raising was successful also. VK4AIV Wal the auctioneer stopped a few times to regain breath and strength. The auction went for more than 3 hours. Everyone had a good time over the weekend and most agreed that the weekend will be worth coming to again next year. Word has it the QSL bureau will definitely be aiming to visit again in 2006.

News from...

New generator for Sunshine Coast Amateur Radio Club (SCARC)

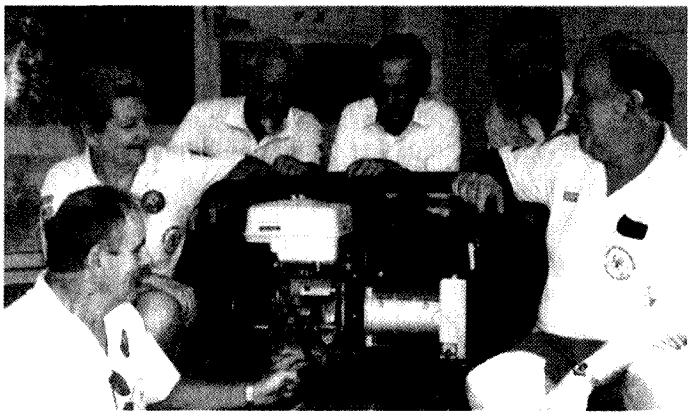
Harvey Wickes VK4AHW
President, SCARC

Recently, the Caloundra RSL Club was approached by SCARC president, Harvey Wickes, VK4AHW, to see if they would be able to help with a much needed emergency power generator. The generator was required to supply the emergency power requirements of the SCARC Clubrooms, where a well equipped WICEN communications center is set up.

As the region is prone to cyclones and local flooding, power and communications can be totally disrupted at times. With the aid of the 6KVA electric start Generator, so generously supplied by the Caloundra RSL, vital WICEN communications can now be assured.

In the interests of portability, the generator has been mounted on a wheeled trolley. It can easily be manhandled onto a trailer by two people, should the need arise.

The second photograph displays the Generator under our new Club Banner, which was funded by the (then) WIAQ grants system. This banner serves to advertise Amateur Radio in general, and is used at SCARC outdoor functions, such as Car Rallies, JOTA and the Lighthouse weekend.



VK5

Adelaide Hills Amateur Radio Society Inc.

Please note the updated information for AHARS Inc. following our Annual General Meeting:

VK5BAR
Adelaide Hills Amateur Radio Society Inc.
PO Box 401
BLACKWOOD SA 5051
Website - http://www.qsl.net/vk5bar/
Email - dellio2@bigpond.net.au

President - Geoff Taylor VK5TY - Phone (08) 8293 5615 - Email geencee@picknowl.com.au
Secretary - Leith Mayfield VK5QH - Phone (08) 8296 6013 - Email lmayfield@iprimus.com.au
Treasurer - Hans Smit VK5YX - Phone (08) 8390 3760 - Email vk5yx@tpg.com.au

AHARS meets on the third Thursday of each month (not January, July or December) at The Masonic Hall, Main Road, Blackwood.

Meetings commence at 7.30 pm. (Meetings may commence later due to prior bookings) Entry is from the rear of the hall.

Leith Mayfield
Hon Secretary AHARS Inc.

VK6

Will McGhie VK6UU
will2@iinet.net.au 08 9291 7165

WARG

The West Australian Repeater Group's annual newsletter arrived at the end of April just before their AGM on the 2nd of May. WARG is one of VK6's most successful clubs having been formed in the mid 1970s and has a current membership of 163. The club maintains more than half the voice repeaters in VK6 along with a BBS and a number of digipeaters. The club runs a Sunday morning on-air net, which had its beginnings way back in the 1980s. Of recent times the net controller, Sunday after Sunday has been Clive, VK6CSW who contributed an article to the newsletter. Clive mentions in the newsletter that he has run the Sunday net from 1996 and has been there 400 times each Sunday morning but is now taking a well-earned break. Well-done Clive.

1923

Back to the history of the VK6 division as told from the council minutes book, 1923. Four new members were accepted at the January 31st meeting and a field day was to be arranged by an appointed committee. Also a separate committee of 3 was formed to represent the Institute so as to be involved with a workshop in conjunction with the Boy Scouts. On the 8th of February the field day committee met with the brief "to develop the social side of the Institute and to arrange competitive tests." Two schemes were put forward, charter the Zephyr on a suitable night or "contact the Swan River ferries to find out the cost of hiring boat (Valdona) with piano and arrange a picnic with musical items on board and a wireless concert in evening." For those who don't know what the Zephyr is it was a large wooden ferry that graced the Swan River for many years. It appears that a field day was not quite the same, as we know of it today.

The February Committee meeting reported on the field day plans. "The Swan River Ferries were interviewed and quoted 10 pounds for hire of Valdona, piano extra." The Zephyr was available "and that we could fix an aerial on it." It was decided that "we take the Zephyr scheme for March 15th on the following condition that we take no liability and the company allows us 100 complimentary tickets." Has the World changed or what? Imagine today hiring a large boat with the proviso that we take no liability, plus 100 free tickets!

February's committee meeting was informed that the Zephyr "would not entertain the suggestion of issue of complementary ticket." I gather the "no liability" was not a problem! The second scheme, the Valdona, was then considered but it was also found that another smaller launch (no name) was also available that could take eighty passengers. It was this launch that was to be secured for 5 pounds. At the field day there would be a "competition for crystal sets for members be held and the prizes 1 pound 1 shilling for first and 10/6 for second."

February's general meeting was to inform members as to the progress on the field day, which was to be held on March 10th. Rulebooks were to be presented to all senior members joining the Institute. The lecture by Mr Coxon was on low power transmitters.

March's council meeting received a letter from the NSW branch "drawing attention to a new journal called "Radio" and asking us for our cooperation in making it the official journal." A motion was carried to that effect. Also a number of radio enthusiasts of Subiaco (a suburb of Perth) wanted to form a club and asked about affiliation. It was agreed to support the new club and affiliation would be considered once the club was formed. The general meeting had a brief report on the field day. "The Secretary reported a loss of 2/1/6 on the river picnic and competition. This has to be made good from Institute funds due to the lack of interest shown by members." The lecture was on knotting and the best knots to use when erecting aerials.

There appear to have been no meetings in April. The council meeting for May had a request from the Victorian Division "who desired us to be represented at the Broadcasting Conference." It was agreed to send a representative. There are no details as to the nature of "the Broadcasting Conference." The general meeting in May congratulated Mr Coxon "on his success in receiving Mr McLurcan (best guess) a Sydney amateur. The power of the transmitter being 10 Watts. The transmission over such a long distance over land on such low power constitutes a World record." Another council and general meeting was held in May on the 30th where a request for affiliation from the Subiaco Radio Society was received with Council to consider. The Secretary was to open an account with The Commonwealth Savings Bank. No mention of where W.A. Divisional funds where kept before this.

A special council meeting on June 6th could not decide on the Subiaco Radio Society affiliation, as rules had not been passed by the general meeting. Another special council meeting on June 21st heard a report on the Broadcasting Conference. However the minutes do not mention what happened at the conference. The affiliation application from The Subiaco Radio Society was "granted subject to the rules governing affiliation being agreed to at round table conference."

June was also the AGM held on the 27th with the usual AGM business. Several mentions of the Broadcasting Conference but no details.

July's Special Council meeting on the 11th was to meet representatives from The Subiaco Radio Society "to lay down conditions of affiliation." There was no conclusion and the meeting was postponed till July 19th at which it was decided that affiliated clubs had to have at least 10 full members. Affiliation rules to be drafted and presented to council. July's normal Council meeting decided "that council members have individual photos taken, framed and inscribed and then presented to the President (Mr Holt) with 50% of the cost to be borne by the Institute." No reason as to the purpose of the photos. Did it happen and if so where are they today? At the July general meeting an outline of the Broadcasting Conference was given but not detailed in the minutes. Members of The Subiaco Radio Society were present by invitation.

A committee meeting was held on August 27 to draw up rules on affiliation and this was done, all 6 of them. At the normal council meeting on August 29 it was decided to hold another Special Council meeting on September 7 to deal with "correspondence re Relay League." August's general meeting discussed the formation of a publicity committee.

At the September special meeting the affiliation report was received and was to be placed before the general meeting. A nomination for Radio Inspector and change of meeting location to the fire station, were items but no mention of "correspondence re Relay League." At the normal September council meeting "a discussion then arose with reference to members of the council absenting themselves without leave." It was agreed to enforce rule 24 against offending members." Attendance at Council meetings was taken seriously in 1923! The general meeting approved of the affiliation rules.

October meetings welcomed two more members and Western Wireless was now to be the "official organ of WA." Also decided "Amalg Wireless re patents lie on the table for 12 months." The lecture was on electrical hazards (illustrated) and a display of high frequency. The

Subiaco Radio Society was present by invitation.

A special council meeting was held in early November where The Mt Lawley Radio Club was affiliated with the WA Institute. Another special council meeting was held later in November with the Wireless Development Association to discuss cooperation in the holding of a Wireless Exhibition and concert. A combined committee was formed to look at the possibility of such an exhibition early in the New Year. The General Meeting for November decided to enquire from "the Eastern States Divisions re broadcasting charges as applied to the experimenter." The Secretary was to "get in touch with Western Wireless re proposed testimonial to Mr Coxon."

December special meetings further discussed exhibition and concert plans and a motion was carried to "hold our meetings fortnightly." Throughout 1923 the number of meetings and the volume of issues discussed was increasing. These notes may not reflect this, as much of the business was relating to changes of office holders and general council business and I have passed over these issues. However the minutes do reflect much was happening with radio in 1923. The council meeting for December had representatives from the Subiaco, Fremantle and Mt Lawley radio clubs. A request from the Victorian Division to "appoint a proxy in Melbourne and be able to attend any conferences with the Radio Department." From the minutes "The Chief Manager of Wireless wrote asking that some action be taken to form a Council or Executive with whom he could consult knowing it was representative of Experimenters interests." It was agreed to appoint a proxy in Melbourne.

The final General meeting for 1923 was a big one held at Central Fire Station Perth. The assistant Secretary was "requested to take all minutes and have them properly recorded." If this happened I wonder where they are? There were seven items of correspondence. A representative was present from the Goldfields Radio Society, "the Secretary Mr.Cecil, who was staying at 1202 Hay Street while in Perth." The Goldfields Radio Society would like to carry out tests with the Institute at a later date" he stated. Recognition was required that Mr Coxon had been transmitting a concert twice a week for about the last eighteen months. A Mr Bush gave members some very interesting information about the Wireless position in England. With season's greetings the meeting closed at 10.20PM 20th December 1923.

It is worth remembering that at this time in radio history, broadcast radio, as we know it, was about to take off. A search of the Internet makes for interesting reading about the beginning of broadcast radio in Australia. A system of sealed radio receivers, that were locked to one frequency only, was tried but failed, as many people (amateurs) just had to fiddle to get around the limitation and tune the medium wave band. Between August 1923 and June 1924 only 1,400 listeners entered the sealed set scheme, while in the same period the Postmaster-General's Department received some 5,000 applications for Experimental Licences from people who could not be properly classified as experimenters.

What an exciting time and is it not a pity we have so little of this history recorded from an Amateur Radio perspective. Our history lies fading away all over the country to perhaps be lost forever.

VK7

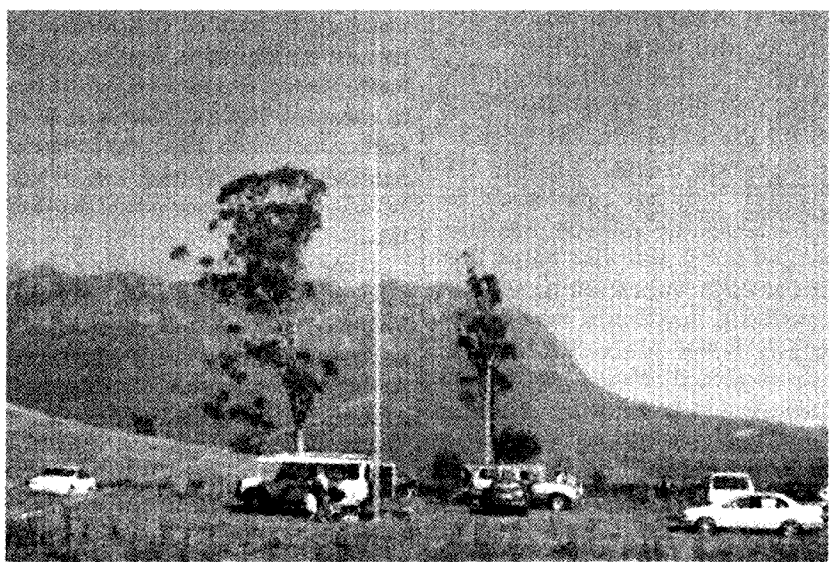
Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

Another successful Targa Tasmania

REAST's WICEN group again enjoyed a wide range of weather conditions ranging from pleasant sunshine to hailstones the size of five-cent pieces and snow on the West Coast. 13 REAST members assisted by 10 family and friends ran repeaters and SOS points around the State. 5 crews of 2 worked every day of the weeklong state-wide event.

Problems on the final day with poor mobile phone coverage on the West Coast saw the WICEN crew provide a mid band VHF to commercial UHF cross band link in the Casino car park enabling UHF handhelds in Headquarters to talk to Tarraleah via the link and Mt Faulkner.

This is a fantastic demonstration of what amateur radio and radio amateurs are capable of. Keep up the great work!



Sheffield Radio Point, Mt Roland in Background (photo by VK7ZZ)

BPL in VK7 – Aurora Energy's 2nd trial

The start of the BPL trial has been delayed one month. It is due to begin this month and will cover 500 Hobart homes. A mobile field strength team has been assembled and is ready for field measurements once locations are known. A VK7 BPL Watch web page has now been established on the Regional website. Take a look and become informed!

VK7 Divisional Honour Roll

At the WIA Tasmanian Division SGM in September 2004 it was agreed to fund the completion of the WIA Tasmanian Division Honour Roll. A draft has been compiled from records and is available for comment on the Regional Website. VK7 radio amateurs are invited to take a look and let me know any information that may assist in finalisation of the Roll.

Central Highlands Amateur Radio Club of Tasmania

The winter getaway weekend will be held at the Tiger Hut at Waddamana. It starts Friday July 22 until Sunday July 24. Comfortable accommodation is available for just $20 per night per person. The facilities are outstanding and include a well equipped community centre, complete with kitchen. BYO is the go. If you do need accommodation, it is important that you confirm a booking with David O'Brien, VK7KDO. Contact David by giving him a telephone call on (03) 6273 0642. We hope to see you there.

Don't forget the CHARCT quiz night, held every Thursday evening at 8.30pm, immediately following the Tassie Devil net that is ably run by Dale VK3YR. The frequency is 3.585 MHz.

North West Tasmania Amateur Radio Interest Group

Much work has been performed to improve Repeater 3, VK7RNW at Lonah thanks to Brian, VK7RR and Joe VK7JG for this work and equipment.

The club's callsign, VK7NW is now being used as the originating station for the delivery of the WIA National News, VK7 Regional News, Spectrum Tasmania and Q5 broadcasts.

A pictorial television version of Spectrum Newscasts, WIA National News & VK7 Regional News on DVD are now being produced. Anyone interested in copies of these DVD's should contact Spectrum via email to: spectrum@spamex.com

Brenton, VK7JB took club members on a guided tour of the TV Translators at Braddon's lookout and Melrose on Sunday 15th. May. Thanks to Brenton for a very informative tour.

The next meeting of NWTARIG is on Saturday 30th. July 2005.

Northern Tasmanian Amateur Radio Club

A working bee on VK7RAA occurred on April 21 with Joe, VK7JG, Allen, VK7AN and Norm, VK7AC climbing to the summit of Mt Barrow. The new antenna has greatly improved the repeater and many amateurs have been heard since the upgrade.

The installation of the APRS Digipeater (VK7RAA) on Mt. Barrow has made a marked difference to the APRS network coverage well down to the South, North East and North West of the State.

Next meeting of NTARC will be at the Alanvale campus of TAFE in the usual spot on June 8th starting at 7:30pm. All welcome. Come along and put a face to the voice.

Radio and Electronics Association of Southern Tasmania Inc.

On May 4, Rex, VK7MO gave an EMR assessment revisited talk. Rex has actually been audited by the ACA and provided some valuable practical experience and knowledge for club members.

REAST, like most amateur clubs, is endeavouring to attract more young people to the hobby. In doing so, all members, especially those organising activities, have a responsibility to consider and provide a safe environment and consider safeguards dedicated to the well being of young people. Child protection and the proper reporting of allegations has become a major social justice issue.

Knowledge followed by action is the best solution. After much research, including the taking of professional advice and deliberation, your Committee has developed a Child Protection Policy and Parental Consent Form.

The policy and form has been published on the REAST web site. We urge all member and potential members to become familiar with it. If you have any concerns, contact one of your Committee members.

ar

Plan ahead

Remembrance Day Contest
13 & 14 August

ALARA Contest
27 & 28 August

ALARA

Christine Taylor VK5CTY

Another interesting piece of history

(from the "New Scientist" for 5th March 2005)

Did you know that the plastic covered wire you use every time you start a new electronic project has its origins in women's hats?

At around the time Michael Faraday was doing his ground-breaking experiments in electricity women wore poke bonnets and other hats that required stiff brims. To keep the brims stiff hatmakers used iron wire that they wound with ribbons so that the wires would not rust and stain the hat.

Faraday took up the idea when he needed to insulate the wire he wanted to make his coils. He used copper rather than iron because of the relative resistance of the metals but he laboriously wound each length of wire with cotton thread or ribbon to insulate them from each other. The system worked but was very time consuming and tedious.

At approximately the same time a young man called Henley was experimenting in electric coils and motors. He did not have the helpers Faraday had at his disposal so he had to find a better way to wrap his wires. He invented a wrapping machine with a handle one person could turn that wrapped long lengths of wire fed continuously through a central hole. No longer was each length of wire wrapped separately.

Eventually with the development of machines powered by steam or electricity the basic principle of Henley's wire wrapping machines became the way all wire was wrapped. Underground and undersea cables are made this way. The principle is still the same now that plastic is extruded onto the wire. Here the wire to be covered is fed through a central hole while the plastic is extruded onto it.

And it all came to be because hat makers had to keep their iron wires from staining the ladies' hats.

The result of the ALARA AGM

There are some changes to the ALARA committee after the AGM this year which is the sign of a healthy association.

The new committee is:

President	Susan Brain VK7LUV
Vice-President1	Marilyn Syme VK3DMS
Vice-President2	Bev Hebiton VK6DE
Secretary	Margaret Schwerin VK4AOE
Treasurer/Souvenir Custodian	Margaret Schwerin VK4AOE
Minute Secretary	Bron Brown VK3DYF
Publicity Officer	Christine Taylor VK5CTY
Award Custodian	Kathy Gluyas VK3XBA
Historian	Shirley Tregellas VK5JSH
Contest Manager	Marilyn Syme VK3DMS
Librarian	Shirley Tregellas VK5JSH
Sponsorship Secretary	Maria McLeod VK5BMT
Editor	Dot Bishop VK2DB
VK1/2 rep	Dot Bishop VK2DB
VK3 rep	Bron Brown VK3DYF
VK4 rep	Dawn Sebben VK4HER
VK5/8 rep	Jean Kopp VK5TSX
VK6 rep	Bev Hebiton VK6DE
VK7 rep	Rosanne Webb VK7NAW

Please contact any member on the committee if you have any suggestions or complaints about matters to do with ALARA.

Silent key

George Douglas Smith VK4ASM

VALE George Douglas Smith VK4ASM from Wurtulla,Sunshine Coast.

Doug, as all knew him, became a silent key at 1810 hrs on 9th May, 2005 after suffering three strokes in one day. Doug, who was formerly known as VK6ASM, would have reached 83 on Wednesday 11th. Doug was a well loved regular on the daily Coral Coast net for many years.

ar

A plea from your reporters

If you have any news about your own activities or those of others which you would like to share with everyone, please contact either (or both) Christine VK5CTY for the AR column or Dot VK2DB for the ALARA Newsletter.

We really want to know what you have been doing and we really want to know about any special awards or presentations you have received. We can't know unless you tell us.

If there is anything in a newspaper, local or national, please send us a copy for our history. Sometimes we do know but sometimes we don't. Please tell us.

Even if your news has also come from someone else, we still want to know. If the news has been printed in another amateur publication somewhere in the world, either recently or a long time ago, that is also OK. There is an agreement between amateur publications that makes a free exchange of information acceptable as long as the source is acknowledged.

If it is from any published source (a book or magazine for example), please include the details so Dot and I can get permission to publish if necessary.

ar

Ron Broadbent G3AAJ, Silent Key

From RSGB news.

Ron Broadbent MBE, G3AAJ, died on 24 April at the age of 60. He was awarded the MBE for his services to amateur radio in 1995.

Ron joined the RSGB at the age of 19 and had been a member for over 61 years. He became involved with amateur satellites in the 1970s and by 1978 was secretary of AMSAT-UK, a post he held for 16 years.

He was made an Honorary Vice-President of the RSGB in 1994. Ron's career was with Trinity House, attending to the UK's lighthouses and lightships.

He retired in 1985 but thereafter worked almost full-time, 12 hours a day, seven days a week and virtually for free for the amateur satellite movement. One of his notable achievements was organising the AMSAT-UK Colloquium for over 10 years. A summary of some of Ron's achievements can be found on the AMSAT-UK web site.

At a personal level I'd like to add that although I'd never met Ron, he was like an old friend. In the early days of amateur radio satellites Ron was the "face" of AMSAT-UK. For many years it was Ron who you dealt with on all matters from articles for "Oscar-News" to software on floppie disks via the mail. Ron's responses were always precise and courteous with a humourous touch which endeared him to everyone.

His MBE was greeted with acclaim by all and his contributions will be long remembered.

Thanks a million Ron.

The AMSAT group in Australia.

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net.

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK6AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

PCsat2

A month or two ago Bob Bruninga appealed for help in producing a telemetry web page for the up-coming PCsat2 experiment. David Johnson, G4DPZ rose to the occasion and the results can be viewed at http://www.pcsat2.info/PCSat2Web/

The site has been set up to display the decoded telemetry data from PCSat2, which is an external ISS experiment in the Amateur Satellite Service. It will be carried to orbit by the STS114 Shuttle mission and attached to the International Space Station by the Mission 11 crew. More details about PCsat2 and the whole project can be found at:

http://web.usna.navy.mil/~bruninga/pcsat2.html

The telemetry web site is still under development and is being fed from a telemetry simulator. When PCsat2 is installed on ISS and working, the telemetry will be relayed to the web site via the internet by a group of volunteer monitoring stations around the globe. By watching this page you can 'snoop' on PCsat2 at any time, not just when it's in your sky.

Launch of Hamsat

Back in April 2002 we got the first hints that something of special significance to amateur radio satellite operators was happening in India.

The AMSAT bulletin board was buzzing with news about a new project from AMSAT-India. It was to be called Hamsat or VUSAT. Hamsat was to take the shape of a 40 kg micro-satellite hitching a ride on a "Polar Satellite Launch Vehicle" being developed by the Indian Space Research Organisation.

At that early stage it was hoped to have the satellite in orbit some time in 2003. Well, time marches on, and after some delays Hamsat was launched successfully on 5th May 2005.

At the time of writing, Hamsat has been declared healthy. It will undergo a 10-day period of evaluation and commissioning and then be released for use by radio amateurs. There is plenty of up-to-date information available at the usual web sites to enable you to set up for this bird.

Special accolades go to William Leijenaar PE1RAH for his part in producing the "Dutch" transponder. William has worked tirelessly on this project for a number of years. We wish Hamsat a long and productive life in orbit.

SatPC32 tracking program

I've been thinking about evaluating the latest version of this tracking program for some time. There have been some favourable comments recently on the bulletin board, in particular regarding the level of support offered by the program's author Erich Eichmann, DK1TB. This prompted me to gird up my loins and download the trial version. The file is over 8MB long so it took about an hour to download on my clickety-clack dial-up system but it came through OK and installed without any hitches at all.

I can't offer any comment on the level of support as nothing has gone wrong yet but I can say the documentation is very good and appears to be comprehensive. I had no trouble setting up the options and it worked straight away.

The screen is colourful with a detailed map offering either Mercator-type or 3D views. Floating menus help to make sense of the many features under button control from the main map screen. The map can be adjusted from 640x480 to 1024x768 size.

The normal view shows the footprint of just one satellite but up to 9 satellites can be displayed simultaneously, their direction of travel being displayed as an

arrow. This is a handy feature as it shows when satellites are likely to be coming your way without cluttering up the screen with multiple ground tracks.

SatPC32 has all the usual features we have come to expect from modern tracking programs. It features a CAT interface for tuning Doppler compensations. This includes the ability to keep track of uplink and downlink frequencies even for "in-band" work such as ISS where simplex mode is employed using two different frequencies in the same band. The CAT interface works with a selection of modern amateur radio transceivers.

SatPC32 includes an antenna pointing driver for several of the more popular auto-track units including the Kansas City Tracker / Tuner and FODtrack.

I was quite impressed by this latest version and you may like to try it yourself. It can be downloaded from Erik's web site which can be reached by typing satpc32 into Google.

Mode S on AO-51

Lots of people freak-out when you mention microwaves and S band. Working the high orbiting birds on this band does involve some fancy footwork with dish antennas and high gain, low noise receive preamplifiers - all good stuff - but the Mode S downlink on AO-51 does not require such a large investment in equipment. Even portable station operation becomes a possibility.

A satellite dish is not required to operate this mode on AO-51. The S band downlink can be copied using quite simple antennas which because of their small size and wide beamwidths can easily be held and aimed by hand. AO-51 is a low earth orbiter and its signal is strong. A corner reflector for S band is only about as big as the covers of a paper-back novel and such an antenna can be used for contacts on AO-51. Small helix antennas using as few as 3 or 4 turns are also useful. Naturally a longer helix would bring in better signals but not so long as to present a problem with aiming. I have several S band helix antennas and I plan to do some tests in a month or two by cutting one back a turn at a time to see what would be the ideal length compromise between gain and beamwidth. I'll write the results of that test in this column. Such tiny antennas are easily held in one hand while the uplink antenna can be some sort of non-steerable, all-sky antenna like a vertical or a quadrifilar helix or Lindenblad.

Of course Doppler shift variations can be a problem, up to +/- 50 kHz on an overhead pass, but this will just serve to keep you from becoming complacent, hi. It's quite permissible to resort to some sort of electro-mechanical (ie. computer) help.

AMSAT'S External Relations Team

What's that? I hear you say.

There are forces at work in the wider satellite community that can impact heavily on amateur radio satellite operations.

To mention just two of these: Firstly the increasing worry among authorities regarding "orbital debris". The near-earth space environment is in danger of becoming quite congested. Rules have been foreshadowed regarding the ability of satellite owners to de-orbit non-functional satellites as a pre-condition of launch. This would certainly have impact on our designs and costs.

Secondly the problem of launch opportunities is something that has to be constantly monitored. AMSAT-NA has formed an "External Relations Team" to address the above matters and to handle interactions with outside groups such as government agencies, launch providers, educational groups as well as other amateur radio and AMSAT groups around the world.

This Team has been busy preparing for several upcoming events. One such event is the "Small Payload Ridesharing Conference" to be held in Denver this year. The focus of this conference is developing increased launch opportunities for small satellites and secondary payloads.

Another up-coming event is the combined Cubesat workshop and Small Satellite Conference in August. This year AMSAT will have a table in the exhibitor area at that conference. Much useful PR should result. The team is very busy in areas of great importance to all satellite users. Their work will help smooth the way for the continuation of the amateur radio satellite scene into the future.

a

Technical abstracts - Mounting Yagis *continued*

However, if you route your coax along the boom and back down your non-conductive mast (Figure 7), you have accomplished nothing. To the antenna, the coax looks just like a metal tube. One solution to this is to route the coax out the back of the antenna and back to the mast in a big loop. Electrically this works well. However, mechanically this is a poor solution. Tail heavy and with a weak mast, they can flop around and break.

With all of the above information, what is the best way to mount a vertical Yagi antenna? End mounting is best, but is limited to small antennas. For bigger antennas, using an additional cross-boom to move the antenna away from the mast and feedline (Figure 8) will give the best results. If you can get the Yagi even a ¼ wavelength away from the mast, it does wonders for the pattern. A half wavelength or more is even better if you can manage it

ar

Beyond our shores

David A. Pilley VK2AYD
davpil@midcoast.com.au

U.S.A.

Morse restructuring

It seems to be a long way off in the U.S.A.

The FCC continues to work toward developing a Notice of Proposed Rule Making (NPRM) that will spell out what the Commission has in mind with respect to possible changes in the current Morse code requirement and Amateur Radio licensing.

Eighteen petitions have been filed. As far as the code issue is concerned, petitions--and comments in response to them--run the gamut from retaining or even beefing up the Morse requirement to eliminating it altogether. (The ARRL's proposal would retain the 5 WPM Morse examination for Amateur Extra class applicants only.) The League and others have also put forth proposals for a new entry-level Amateur Radio licence class.

The FCC appears unlikely to release an NPRM any sooner than mid-2005. Once public, the NPRM will initiate yet another round of public comments--this time on what the FCC has proposed. An FCC Report and Order to implement any new rules regarding Morse code and licence restructuring is unlikely before the second half of 2006, although it's possible the Commission could wrap up the proceeding before then.

(ARRL News)

Germany:

Changes in amateur regulations

Germany has recently announced changes in their Amateur Radio regulations. Some revisions stem from the outcome of World Radiocommunication Conference 2003, which essentially left it up to individual countries to decide if they wanted to continue to impose a Morse code requirement for HF access.

In Germany, the Deutscher Amateur Radio Club (DARC) reports that, effective February 19, there now are only two classes of Amateur Radio licence: Class A (formerly Class B and C) and Class E (formerly Class D). The new Class A works in accordance with the Harmonized Amateur Radio Examination Certificate (HAREC), T/R 61-02. It permits radio amateurs in participating European countries to go from one European nation to another and obtain a full licence.

Long time visitors or foreign residents with a CEPT licence in Germany will be issued a German Class A licence. The Class E licence remains limited to VHF/UHF frequencies only, with the addition of 10 GHz, output limited to 10 W EIRP. There also have been some changes to the spectrum allocation at 1.8 MHz. The text of the new regulations, in German, is available on the DARC Web site <http://www.darc.de/aktuell/afuv.pdf>.

(ARRL N/L 11/05)

Spain:

Changes to their licence

In Spain, the Unión De Radioaficionados Españoles (URE) reports two significant changes in that country's Amateur Radio regulations, effective March 3: Spain has deleted the Morse code requirement to obtain a Class A (General) or Class C (Novice) licence. Also, Class A (General) and Class B (Restricted) licencees now are allowed to use the band 50.0 to 51.0 MHz "under special and particular authorization."

(ARRL N/L 11/05)

Ham radio in space:

Tracking CubeSats

Hams interested in space telemetry reception are invited to participate in a world-wide effort to support student groups that have designed and made CubeSats. These are satellites measuring 10 centimetres cubed and weighing less than 1 kilogram. A discussion group and a new website have been created to provide information on these educational CubeSats. They are at http://groups-beta.google.com/group/CubeSat and http://users.crosspaths.net/wallio/CubeSat.htm respectively.

(GB2RS)

Cyprus

Expanded 40 metre band

Hams in Cyprus have been given more spectrum on 40 meters. This, with word that Cypriot amateurs may now use 7.100 to 7.200 MHz in addition to 7.000 to 7.100 MHz they already had.

With this action, amateurs in Cyprus join those in the UK, Ireland, Croatia, Switzerland, Norway, Denmark, San Marino and Iceland who already have access to 7 point 100 to 7 point 200 MHz. The expansion of the 40 meter band is included in the Cyprus Department of Electronic Communications National Frequency Plan which has been posted on the Internet at www.tinyurl.com/528wx. It's in Adobe pdf file format.

(GB2RS)

Norway

Norweigan club stations get 5 MHz

And those are Norwegian club stations being heard at 5 MHz. This with word that Norway has granted club operations access to a number of 'channels' on 5 MHz. effective at midnight Norwegian time on 1st April.

At least two Norwegian stations were active from the outset. They are LA2AB near Oslo and LA1K in Trondheim.

The LA2AB operators had a good opening night. They worked two other Norwegian stations, five stations from the USA and numerous operators across the UK.

Eighteen club stations in Finland also have special licences to operate on 5 MHz frequencies.

(GB2RS)

S.O.T.A.

Summits on the air

We had IOTA , now we have SOTA.

Last month a group of enthusiasts in the UK operated from 29 summits around England, Scotland and Wales and founded the beginnings of a future challenge and perhaps in the long term, a new contest. There are currently 11 SOTA Associations. Most are in Europe and they are now wanting to expand world-wide. So here is an opportunity for you to be the first VK SOTA station and operate this winter from the Snowies! Have a look at http://tomread.co.uk

ar

Awards

Malcolm K. Johnson VK6LC
WIA Awards Manager

WIA 3 & 5 Band DXCC Program Official Release

The WIA officially releases its new 3 & 5 Band DXCC Program and invites submissions for these new awards.

Introducing the 3 & 5 Band DXCC program has taken the WIA just over 1 year to develop, finance and to deliver these new exciting challenges to our membership.

This completes our DX stepping stone from Single Band DXCC progressing up to 3 Band and 5 Band DXCC, extending to a new Multiband Program that includes all 11 approved bands.

Smart computerised documents have also been designed and trialed with over 40 DX members spread across Australia and Overseas.

New administration rules have been established. The Australian DXCC "entity" bench marks were also reviewed for all MultiBand Awards and are approved by the WIA Board.

The new awards have been developed incorporating sponsored, financial and legal graphic support. While they are not difficult to achieve, they will require dedication in DXing and Qsling.

3 Band DXCC program (3BDXCC):

This Certificate includes a choice of any 11 Band-modes from 2m to 160m.

They are available in Single or Open Awards. Deleted entities do not count for this award.

Honour Roll bench mark is set at 700 and DXCC Excellence bench mark is set at 900.

Individual progress achievement awards are from 350 to 1000 entities.

5 Band DXCC program (5BDXCC):

"Classic Award"

This Certificate includes only the "Traditional Bands" 5 Band-modes 10, 15, 20, 40 & 80m.

They are available in Single or Open Awards. Deleted entities do not count for this award.

Honour Roll bench mark is set at 800 and DXCC Excellence bench mark is set at 1000.

See WIA Awards Program certificates in full colour on inside back cover

Individual progress achievement awards are from 550 to 1200 entities.

"Premier Award"

This Certificate includes any choice of 11 Band-modes from 2m to 160m.

They are available in Single or Open Awards. Deleted entities do not count for this award.

Honour Roll bench mark is set at 900 and DXCC Excellence bench mark is set at 1100.

Individual progress achievement awards are from 550 to 1200 entities.

MultiBand DXCC Program (MBDXCC):

Our current DXCC single band "DXCC Standings" will be joined by the new "MultiBand DXCC Program" this will extend the performance over all bands. This new program should be ready for publication by the end of this year. The simple format will be to totalise all bands.

The minimum entry is 100 confirmed entities "Open" for each respective Band, excluding deleted entities.

The "WIA DXer" for 3 Band and 5

continued on page 46

WIA Multiband DXCC Program

Typical sample only

Ending 30th April 2005

Callsign	2m	6m	10m	12m	15m	17m	20m	30m	40m	80m	160m	Total
CT1EEN		110	294	290	324	305	328	146	243	163		2203
VK3EW			273	220	307	246	330	129	294	285	102	2186
VK1TX			101		212	200	306		100			919
VK5WO			139		146		226		242	131		884
9V1RH				141	264	119	222		129			875
VK3PA			133		139		253		136	167		848
VK6LC			109		131		301		166	106		813
VK2CA			158		196	100	193					647
VK4EJ			123		275		245					643
VK2DEJ					118		312		106			536
VK3KE			103		148		267					518

Ian Godsil VK3JS

Contest Calendar June - August 2005

June	4	VK/trans-Tasman 80m CW Contest	
	11	ANARTS WW RTTY Contest	(Digi)
	11	Portugal Day DX Contest	(SSB)
	11/12	South America CW Contest	
	11	Asia-Pacific Sprint Contest	(SSB)
	18/19	All Asian DX Contest	(CW)
	25/26	Marconi Memorial HF Contest	(CW)
July	1	Canada day Contest	(CW/SSB)
	2	Jack Files Memorial Contest	(CW/SSB/PSK31)
	9	VK/trans-Tasman 160 Metres Phone Contest	
	9/10	IARU HF World Championship	(CW/SSB)
	16/17	CQ WW VHF Contest	(All modes)
	23	VK/trans-Tasman 160 Metres CW Contest	
Aug	5	QRP Day Contest	(CW/SSB/FM/PSK31)
	6	TARA Grid Dip	(PSK/RTTY)
	6/7	10-10 Intl QSO Party	(SSB)
	13/14	Remembrance Day Contest	(CW/SSB/FM)
	20/21	Keymen's Club of Japan Contest	(CW)
	20/21	SEANET Contest	(CW/SSB)
	27	ALARA Contest	(CW/SSB)
	27/28	TOEC WW Grid Contest	(CW)
	27/28	YO DX HF Contest	(CW/SSB)

Greetings to all Readers

The year is certainly on the march again and already there have been some important VK contests held. I hope that you made an effort to support them, but if not then there are more to come!

Jack Files Contest

This contest has been run for many years as a memorial to the late Jack Files, a long-serving VK4 WIA Councillor who did a lot to help the cause of AR and the WIA. Like some other VK contests, the event has not been well-supported over the last few years, so that now is a time for change.

The organisers and Manager, John Spooner VK4AJS, would like to invite ALL amateurs in both VK and ZL to take part in this contest, which has now been brought under the auspices of the new National WIA. The rules are below.

I believe that the original trophy was misplaced for some time but has now been found, so this will be polished up and made available for display.

When you look at the Calendar above, this Jack Files Contest will fit nicely into the other local contests – a group of VK events early each month, culminating in the RD and ALARA contests in August.

All of these are "non-threatening" contests in that they do not take a great deal of effort to enter. Some effort, yes, but not like the 24/48 hours DX contests where every call counts and the competition is fierce.

Contest Future

We know that contesting in this country has never been highly regarded, but my theme has always been that they could be much healthier than they are simply by SOME participation by MORE operators.

If, on the other hand, you would like to see contests eliminated from the airwaves, then just wait a while. My prediction is that with the attitude shown by VK amateurs collectively to operating, not just in contests but on-air in general, there will be no Amateur Service in this country within the next ten years.

Think about that! Is that what you really want? No longer can one claim an inability to learn Morse as an excuse (by the way, what would those people have done had they lived in WW2 times and had wanted to be in Signals?). There are other modes easily useable on-air and yes there are sometimes contests for those modes.

An example that comes to mind is the IRLP Contest held in March-April. Details of this were in AR and on the Web, but I doubt that more than 15 VKs took part in the event, even though it ran for ONE MONTH. I know that Graham VK3JBO scored over 200 contacts and yes he is the node owner, so perhaps you could argue that he HAD to keep an ear on his node. This is specious, in fact, as any operator could have called in and taken part. Graham did a wonderful job in keeping his node connected to many places throughout the world for the duration of the event. Congratulations Graham and thank you for promoting this contest.

Summary

My plea to all VK amateurs is to WAKE UP and be more active or we shall not have any Amateur Service in this country in the foreseeable future. Already the ACA has thoughts about the use of spectrum for other purposes. Please ask your local ACA office about this, or check the web site www.aca.gov.au Don't think Oh, the WIA will fix it all up. The WIA is busy doing what it can now, but if ACA says "Service Terminated", then that will be it – Service Terminated!! It rests with YOU.

73 and good contesting,

Ian Godsil VK3JS
Federal Contest Co-ordinator

Jack Files Contest 2005

2 July 2005

from John Spooner
VK4AJS Contest Manager

This contest is in honour of the late Jack Files, a long-serving VK4 WIA councillor. It is coordinated by the Queensland Advisary Comittee and is sponsored by the WIA.

Since the dissolution of the WIA divisions within Australia and the establishment of a national body, it has been decided to make this contest a national remembrance of an amateur who gave long service not only to benefit Queensland amateurs, but to all amateurs within Australia. So a slight change of the rules for this year's contest has been implemented to open up this event to all VK Amateurs. The object is still to work as many different stations in different Queensland shires and towns for the purpose of multipliers, but in addition to this all participants will be able to count the first VK state or territory worked in each one hour block of the contest as a multiplier. Also, provision will be made for the working of the same station within the same one hour block if one or both of the stations are mobile and are passing through different shires, towns, states or territories.

Object is for amateurs to work as many other amateur stations, and particularly as many different VK4 shires and towns, as well as many different states and territories as possible within each one hour block of the contest.

Date: Saturday, 2nd July, 2005

Time: 0800UTC – 1400UTC in six one-hour blocks for the purpose of duplicate contacts.

Band: 80 metres only. Use 3.5MHZ – 3.7MHz to put all licence grades on an equal footing.

Modes: Either CW; SSB; PSK31, or All Modes

Categories: Single Operator; Club Station (each category can be a mobile station)

Exchange: Non-VK4 stations will send RS(T) plus serial number starting at 001 and incrementing by one for each contact. VK4 stations will send RS(T), serial number and two-letter shire or town code for purposes of multipliers.

Score: One point per contact

Multipliers: Each VK4 Shire or Town counts as a multiplier only once over the entire duration of the contest. All participants may also count the first contact in each state or territory as a mutiplier and these may be counted within each one-hour block during the contest.

Final Score is total QSO points X total number of multipliers.

Repeat Contacts: In order to make best use of the band, stations may be contacted once in each hour on each mode. Repeat contacts with stations may be counted within the same one-hour block only if the station is mobile and crosses from different shires, towns, states or territories to another. Repeat contacts must not be consecutive.

Logs must show full details of all QSOs and must be accompanied by a Summary Sheet showing operator's name; address; callsign; category and mode entered; claimed score and a declaration that the rules and spirit of the contest were observed.

Send logs by mail to: Files Contest Manager, PO Box 1006, Yeppoon, 4703. Logs may be sent by e-mail in text format to: vk4ajs@optusnet.com.au

Closing date for all entries is 2nd August, 2005

Certificates will be awarded to the top scorers in each mode in each VK State, ZL, P29 and any DX country (i.e. country outside VK, ZL or P29). As well, there will be a special certificate awarded to the overall highest VK scorer who will be declared overall contest winner. The only stipulation is that the overall winning operator must be a VK amateur.

Asia Pacific DX Convention

Dear Fellow DXers and Contesters,

You are cordially invited to the Asia Pacific DX Convention, which will take place November 18 through 20, 2005 as the first Asian International DX event.

In addition to the presentations of recent DX-peditions, technical sessions, displays, etc. that you find at most large DX conventions, this convention offers something special? such as a tour to the Icom factory, a technical session led by the Icom IC7800 design team, a tour to the electronics district, and more? since it is being held in the country in which most of the amateur radio equipment is developed.

For the non-hams accompanying you, activities to enjoy Japanese culture, such as tea ceremony and flower arranging, are being prepared.

We would appreciate your introducing this convention to your DX/contest club members. See our website for more details at: http://www.ja3.net/apdxc

For convention updates, please visit the website and send an e-mail to subscribe to the APDXC newsletter.

We look forward to welcoming you at the APDXC in Osaka, Japan.

APDXC Committee / JA3USA

25th ALARA Contest 2005

Australian Ladies' Amateur Radio Association Inc.

A0031101B

27 & 28 August , 2005

Celebrating 30 years since the founding of ALARA with *special points for contacts with original ALARA members*

ELIGIBILITY: All licensed operators throughout the world are invited to participate. Also open to SWLs.

OBJECT: Participation: YL works everyone, OMs & Clubs work YLs only.

One contest (combined phone and CW) run over 30 hours.

STARTS: Saturday 27th August 2005 at 0600 hours UTC

ENDS: Sunday 28th August 2005 at 1159 hours UTC

SUGGESTED FREQUENCIES: Bands to be used are 3.5, 7, 14, 21, and 28 MHz only. The following are suggested frequencies for easier location of contacts:

28.380 to 28.410

21.170 to 21.200 and 21.380 to 21.410

14.250 to 14.280

7.070 to 7.100

3.560 to 3.590

OPERATION:

* Every individual phone or CW contact may be counted.
* There must be an interval of greater than 1 hour between contacts with any one station on any one band and in the same mode.
* No net or list operations
* No crossmode operations.
* No crossband operations.
* All contacts must be made in accordance with operator and station licence regulations.

PROCEDURE:

Phone: call "CQ ALARA Contest"

CW: YLs call "CQ TEST ALARA"

OMs call "CQ YL"

EXCHANGES: ALARA member: RS or RST, serial no. starting at 001, ALARA member, name.

ALARA members who joined before 1980, please advise all your contacts

YL non-member,

OM or Club: RS or RST, serial no.starting at 001, name, and whether Club station.

OMs, Clubs & SWLs work YLs only.

SCORING:

Phone: 5 points for ALARA member contacted

4 points for YL non-member contacted

3 points for OM or Club station contacted

CW: All contacts made on CW count for double points

OM, SWL, 5 points for ALARA member logged

CLUB: 4 points for YL non-member logged

and

a special for this year only:

Contacts with ALARA members who joined prior to 1980

multiply the above points by 3

LOGS: Single log entry. Logs must show date/time UTC, band, mode, callsign worked, report & serial no. sent, report & serial no. received, name of operator of station worked, whether it is a Club station, and points claimed. (See Sample Log this page)

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, and no correspondence will be entered into.

Logs must be received by the Contest Manager by: 31st October, 2005.

CONTEST MANAGER:

Mrs. Marilyn Syme VK3DMS

99 Magnolia Ave.

MILDURA. 3500

VIC. AUSTRALIA OR:

alaracontest@wia.org.au

CERTIFICATES will be awarded for the following:

Top score overall

Top score phone only

Top score Australian YL CW

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 CW

Top score VK Club station

TROPHIES will be awarded to the following:

Top scoring Australian YL

Top scoring DX YL

CLUB STATIONS: Operators of Club stations may use the Club call only for contacts, and MUST identify each contact as with a Club station. Use of personal callsigns while operating as a Club member is not permitted.

ar

Sample Log:

Date UTC	Time UTC	Band MHz	Mode	Callsign	RS(T) & Serial No. Sent	RS(T) & Serial No. Rcd	Name	Points
30/08	0135	28	SSB	VK6DE	59001	58028	Bev	5
	0141	21	CW	VK3KS	599002	599045	Mavis	30
	0600	14	SSB	FK8FA	59025	59011	Aimee	5
	1100	3.5	CW	VK7LUV	599129	599004	Susan	10
	1103	3.5	SSB	VK3BSP	59130	59006	Joe (Club)	3

Over to you

BPL interference

The probable instigation of Internet and other digital information over powerlines in the frequency range to around 10 MHz will almost spell the doom of HF radio communications throughout Australia - not just areas where the BPL is projected to be in use. I will give you an example of the problems from personal experience.

Back in the early 1960s I lived on the Victorian/South Australian border at Kaniva. I was a volunteer operator on the HF CFA radio network. We were experiencing power line interference from time to time, but had no idea why we were getting interference of this nature as there were no high voltage power lines within perhaps 50 kms. This was well before the SEC had reticulations right throughout Victoria. We dismissed it as some thing that had no explanation.

A number of years later I joined the Radio Branch of what is now the Australian Communications Authority and became a Radio Inspector. Over a period of time I became quite proficient at solving interference problems on frequencies from around DC to around 1 GHz. The problem of the HF interference I'd experienced on the CFA network had always puzzled me as I had no answer but my experience as a Radio Inspector ended up providing me with the answer. As most amateurs know interference from power lines will wreck radio coms in the near vicinity. But hey, it is a broadband HF transmission using a VERY good HF antenna in the form of power lines. We use the ionosphere for our long distance transmissions and the interference will do the same, hence our problems with the CFA HF radio interference.

This means of course that the BPL will cause the noise floor to rise throughout Australia not just in areas where the power lines are in close proximity. It may mean that 1 µV signals can no longer be heard only signals above 10µ V, even in outback areas! In town areas the noise floor may rise to 1 millivolt or more. Digital garbage does not sound like powerline interference, probably just a hiss, your S-meter just rises up the scale. I suspect it will be difficult to trace to its source too.

I understand that PBL is to be trialed in Tassy (maybe already by the time this letter appears in print) where there are few HF services. I've also heard said that the organisations wanting to use PBL are pressuring the ACA/Government to amend the Radio Communications Act so that users cannot complain about interference caused by the PBL usage.

Complain to our politicians about this money driven idea that has scant thought for those disadvantaged by it. It is something we must do before it is too late.

Discrepancy in size descriptions

I've read the excellent antenna construction articles, by Drew Diamond and others, in recent editions in AR, and noted with some consternation the perceived discrepancy in size descriptions for plastic (UPVC) water pipe.

For those who are not aware of the reason, here it is. Water pipe - be it plastic or steel - is manufactured not with us amateurs in mind, but for for those in the business of transporting water (and other suitable liquidy things). Their focus is on the capacity of the pipe. Therefore, all their pipe sizes relate to the inner diameter of the pipe (called the Nominal Bore size) - not the outer diameter.

The outer diameter can vary within a single bore size, depending on whether the pipe is for high pressure or low pressure use. High pressure pipe will have a greater wall thickness, and therefore a larger outer diameter, than low pressure pipe.

There are two ways around this when choosing a pipe size: Either become very familiar with the standard Nominal Bore sizes, and the range of wall thicknesses, and make your calculations to suit prior to going out and purchasing; or arm yourself with a trusty micrometer and steel yourself against the glare of the salesperson, as they watch someone they suspect will misuse and maltreat their precious water pipe make a selection.

Barry Miller VK3BJM

Shopping by Internet

Having retired in the last couple of years, I have been giving increasing amounts of time to ham radio, restoring an old New Zealand Army ZC1 MKII transceiver, recapping power supplies for Collins and Drake gear, aligning receivers, and branching out into new technology, such as building a VFO using DDS chips.

All of this necessitates finding components, for which I use the facilities offered by the Internet.

My sad observation is this, that despite a number of Australian supplier websites that are well designed and easy to use, many are deficient in design or technical and price information. However, the worst feature is the number that simply do not respond to e-mails asking for further information. I have found that some of the U.K. sites are similar. One U.K. business in particular, which manufactures rather nice morse keys, has had problems with its online ordering software for several years. I have politely written to them several times and have not received a reply, nor have they fixed their site. Fortunately, I found one of their keys practically brand new on eBay for about half the new price.

I just do not understand how it is that many U.S. businesses have excellent websites, are quick to respond to e-mails, and promptly deliver goods, yet some Australian and U.K. businesses do not seem to realise the potential of the Internet nor do they seem to realise that importation direct from the U.S. can often be less expensive than buying locally because of the generally higher markups here.

Kevin B. G. Luxford VK3DAP/ ZL2DAP

ar

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

DX~ News & Views

VK4OQ
P.O. Box 7665,
Toowoomba Mail Centre, QLD 4352.
E-Mail: john.bazley@bigpond.com

It is several months since Amateur Radio published a DX column. In the past few months there have been occasional requests from members that it should be re-instated. There is no doubt that DX is alive and well in Australia – you only have to look at the DXCC listings in the January/February WIA magazine, so perhaps the need is there. Well I have volunteered for a period of 12 months, at the end of which, hopefully we will know whether or not you want the column to continue!

I will endeavour to draw attention to planned DXpeditions and report on DX activity generally. Remember the column is for your benefit and therefore I am interested in hearing your News AND Views on DX related matters, so please feel free to either write to the above address or send me an e-mail.

In spite of the continued decline in the sunspots we have, in the past few months, had some excellent DX, with activity from some rare spots. I was asked recently what are the criteria that make an area rare? To me 'rarerity' of DX really depends on how far you are away from the station needed – band conditions and the amount of activity from that area. How would you define a rare spot?

During the year a number of organisations solicit 'Most Wanted data ' for the benefit of those dedicated travellers interested in operating from 'Wanted' DXCC entities. So what are your 20 most wanted countries? Let's have a list from Australia. It will be interesting to see if Bouvet or Kure top the list!

So what has happened in the past few months? The most disappointing news was the postponement of the Peter 1 Island trip. I say postponement for I understand that it is still hoped to activate Peter 1 in 2006. I am sure that we will get plenty of advance publicity.

Looking back during the past few months as I started to write this, I was amazed at the number of DXCC entities that have been activated.

The top spot must undoubtedly go the amateurs who put the Andaman Islands back on the air and the wonderful assistance that they provided following the Tsunami.

The second I think was the operation from Kergulen Islands.

The DXCC countries activated by visiting amateurs in the past few months include (I say 'include', for quite unintentionally I will undoubtedly have missed someone !) A25,A5,BV,C5,C6,CP,CT3,CU7,D2,FG,FM,FY,GJ,GU,HB0,HC,HH,HL,HV,JD1O, J6,J7,J8,JW,KH0,KH5,KH8,KP2,LX,OA,OH0,OJ,OX,P4,PJ7,PY0F,S7,S9,SO,SU,TF,TT,TU,TZ,V3,V5,V7,VP5,VP2V,XV,XT,ZA,ZB2,ZD8,ZF2,ZK1N,ZK1S,ZK2,ZL7,3B8,3D2,4U1UN,5T,5Z,7X,8P6,8R,9H,9N,9Y.

Is HK0 Malpelo on your wanted list? HK1XX is organising a return trip sometime between June 2005 and March 2006.

K5LBU is putting a team together to activate 3DA Swaziland for ten days in July. He hopes to have six operators – 3 CW & 3 SSB . If you are interested in joining this Dxpedition then contact him at-- frosty1@pdq.net

Twelve operators from Canada and the US are planning a trip to CY9SS St Paul Island between June 7th and July 7th. They plan to have two stations on HF, two for 6 metres and one on 2 metres. QSL to VY2SS.

PA7FM reports there is good news for DXers needing Chad on a few more Bands or still as a new one. The "Working DXpedition" to Chad, TT8M and TT8AMO, has been extended for at least two more months. The operation was originally scheduled to end on the 12th May. It now looks as though it will last until sometime in August, or even later. There will be more 6m operation starting in mid-June when TT8M will take a 6 m yagi provided by the U.K. Six Meter Group to Chad, after a holiday at home. Each of the two ops will take turns, having an off-duty month, apparently out of the country and back at home. Michael will be trying to get authorization to use digital modes, his current license being limited to CW and SSB. TT8AMO will operate CW only. TT8M will be on all modes and 6 m. There are now 9,000 QSOs in the logs, combined, including 228 on 160 and 1171 on 80. It appears the 160 and 80 part of the operation will remain over and done with. With the operation extended, Michael and Pierre will not wait until the operation is over to get QSL cards printed. They will start that process moving right away. QSL both TT8M and TT8AMO via PA7FM. Remember, one U.S. dollar does not cover the return postage from Europe to outside Europe, so US$2 will be needed. (If you still need TT8 on 40 metres then look for TT8AMO who likes the low end of 40 metres around 2000 GMT) There is a log search facility up and running.

Sudan ST2BF (ex D2BB), Fernando, is settled in to his new QTH in Sudan, and has been enjoying excellent propagation. He has a Kenwood TS-50, a modem for the digital modes and a 3 element triband yagi. Fernando has only put up antennas for 10, 15 and 20 metres. Someone has been pirating his call on 40 CW. QSL via W3HNK.

OH5NKD (OH3DD), Janne, has been working in Angola for several months now and QRV from Angola as D2DX. He is expected to be there until sometime in 2007. His plans are to be active on all bands and modes. Janne is currently starting construction of antennas for the low bands. Recently his radio broke but he has now replaced it with a brand new Icom.

F6FVX, Luc, is going to be on the air from Benin (TY), West Africa, this summer. Look for Luc on the bands from August 23-September 4.

Several Italian amateurs are planning an expedition to East Kiribati T32, between September 28-October 15.

So that about 'wraps up ' the first month. Comments please by the 8th July for August Amateur Radio – yes that date is correct!

Special thanks to the authors of The Daily DX (W3UR) and 425 Dx News (I1JQJ) for information appearing in this months DX News & Views. For interested readers you can obtain from W3UR a free two week trial www.dailydx. com/order.htm

ar

Awards

continued from page 41

Band classes will be awarded the WIA Awards Program annual Certificate. The closing date will be 31st. December each year, this can only be awarded to the same person once in every 3 years. These awards will be presented by the WIA President and issued to both VK and DX entries. We are still looking for DX Trophy sponsors?

A typical listing is shown on page 40.

Certificates

These are truly outstanding, colourful and have a world class identity, the best we have ever been able to produce. All of these awards are graphically designed for A4 (210x297) with an extended border to A3 (297x420) thickness 200gsm Colortech. Progress achievements, Honour Roll and DXCC Excellence self adhesive award labels are all designed complete for these awards.

The costs of these awards are listed and shown separately in "Award Fees", page 47 of this magazine.

The WIA Awards are the leading edge with this program, setting pace with the world and creating a mile stone for our National Radio Society 2005. You can also be very proud of this.

We thank our progressive WIA Board members 2005, all review assessors, our financial sponsor "VK Classifieds", contributions from the VK6 Division Council, VK. DX members and the certificate backdrop sponsor "SSEC/UW-Madison" for supporting this wonderful project.

The new certificates are shown on the inside back cover page of this magazine.

Alternatively they can be viewed on the National website along with all down loadable smart document log and application sheets.

For those who prefer manual applications this package can be printed and posted at a cost.

Website: http://www.wia.org.au/awards/

email: awards@wia.org.au

Postal address: POB. 196, Cannington. 6987. Western Australia.

Please enjoy your DXing, be very proud of your achievements and display your award with pride.

Malcolm K. Johnson. VK6LC
WIA Awards Manager

Members' comments on the new Awards:

I think its a great step forward for the DXCC program here in VK.

A single band DXCC is hard enough, but a 3 or 5 band really raises the bar for the avid DXER. It also puts the WIA up there with the ARRL and CQ mag who already offer 5 Band DXCC.

The 3 Band DXCC is a very achievable goal for many. I know I have worked over 100 countries on 10, 15 and 20. Getting them confirmed, as you know, is always a challenge!

John VK6HZ/VK6KK

An appropriate move in the light of the reformation of the WIA.

Never having been an Awards Manager I can only venture a layman's opinion of the new ideas.

The certificates are of a nice design and colour but maybe could be a little bigger than the usual A4?

The 3 Band, 5 Band and Multiband DXCC program rules are quite detailed as they should be but maybe an abbreviated version could go into Amateur Radio.

Nice to see 6m mentioned

No detailed criticisms as I don't know enough about the subject but someone has put a deal of work into the new ideas.

Bevan VK4CXQ

At last our very own "VK" Multiband DXCC Awards. I'm sure all of us interested in the DXCC awards program will be chasing these awards. The 3 5 and 8+ won't be easy to achieve, but will be worth the effort . Congratulations to "VK" awards manager, VK6LC Malcolm Johnson for all his time and effort spent, in making this possible.

Dick Moore VK5ATU

This is good forward thinking and it will increase interest in working new countries on the different bands in the DX ranks of the younger and new operators.

I know it will take sometime to work through the early stages with some changes to be made and some fine tuning; but with patience a good outcome should be achieved in the long run. I certainly will be participating in the program and wish it success.

Austin VK5WO

A good idea, particularly the 3-Band award - I think that should create quite a bit of interest, hopefully anyway. Just a bit of a nuisance having to drag out all one's cards to be checked and then return them to their original places. Still, you don't get something for nothing!

Gwen Tilson VK3DYL,

What a great idea having not just a 5BDXCC! This allows most HFers a shot at a new certificate with the 3 band version.And Aussies being a competitive bunch might just find themselves spending more time on HF. Surely that is good news for the hobby.

You have had me checking my log to see what I could qualify for and I'm sure others would do the same. This new generation of certificates give us something else to strive for.

As for the rules, I am happy with them as they stand. The deleted country rule puts everyone on a level pegging. I believe however if a DXCC entity has not been activated for 5 years It should be deleted until it is. Some of these rare ones might not be active for extended periods due to being wildlife reserves and also in dangerous or life threatening areas and might just as well be deleted. This would allow the younger hams to achieve honour roll status, instead of having to wait 20 years between DXpeditions. This is only for the 3 & 5 Band certificates.The normal DXCC ladder must remain the same containing both current and deleted entities as it has been that way since it began, But I think that is how I understood it anyway.

The Certificates are first class.

Bernie VK4EJ.

On the certificate I would suggest that in the text that "Dx" be changed to "DX".

I wonder if an approach to the ARRL to use their LOTW as supplement to QSL Cards is worth considering as it is likely to be the way of the future. It may attract many who no longer chase cards due to the cost factor. It would be a good one to be involved with the LOTW early on in

its life. The computer transfer file would be interesting!

Jim VK3DBQ

I have no problem with the criteria that have to be met. The certificates look great. The three band award will give the small block Dxer like myself a goal to aim for which is achievable. I think the awards will be well accepted.

73 Dave VK3JMB

I am delighted that someone has actually taken the time to think about what could and can be offered to members who wish to apply for DXCC awards. Being a member of the WIA since 1981 I have always thought that the program might one day need a bit of a lift, and you have done this by the introduction of the 3 and 5 band DXCC awards program.

This will put some life back into the DXCC awards challenges, as most of us old timers have all the DXCC Countries now confirmed because of the "LAST ONE" most needed Nth Korea is just another notch on the wall now so as to speak. The 3 band award is a very nice stepping stone from the 100 countries award for some, but the one that takes my interest is the 5 BAND DXCC award. This is what the VK WIA Awards has been missing, and I am extremely pleased to see the introduction of an award of this excellence added to the fine list already obtainable from the WIA Awards Manager. 5 Band DXCC from Australia is not an easy feat especially on the "lower bands" it takes a lot of "reading the bands" with long hours in front of the radio and strange phone calls in weird hours of the morning, what is also needed is a wife and/or family that understand why you really have to be out of bed at someone's "grey-line" just to yell at them your 4 x 4 QSL. on 80 meters SSB. I can only speak for SSB as this is the mode my application is based on. Working the DX towards these awards is challenging, but what you will gain is lifelong friendship and admiration from fellow Australian amateurs striving for the same goal.

5BDXCC

Don't expect to do it overnight, it takes many hours of intense dedication, a good station, antennas and a "good set of ears" DXIS.

David J. McAulay VK3EW

Over the past few months I have been trying out the new 3 Band DXCC application and record sheets developed by the WIA Awards Manager.

I am not an Excel expert, all I know is how to enter the data and save, and I must say that Mal VK6LC has done a first class job in developing these new sheets. I found it easy to enter the data and I even learnt (sort of) how to cut and paste previous data I had.

Also the new certificates are excellent, I cannot wait to get my application in for my 3 Band DXCC.

Graham VK6RO

WIA Awards Program Schedule of Fees, dated 1st March 2005.

General Certificate Awards: (sized A4 and A3)

Australia.

W.I.A. members new applications - free.
Non-members new applications - $12.00 Aus.
W.I.A. members replacements - $10.00 Aus.
Non-members replacements - $12.00 Aus.
Overseas non-members - $12.00 U.S.D. or 10 IRCs.
Special reduced pricing for 2 or more awards under 250 grams postage.

DXCC Certificates award attachments.

DXCC Progress award (self adhesive) labels), increments of 25. (125-325).
W.I.A. members 25 cents $Aus each. non-members 30cents $Aus each.
Overseas non-members - $1 U.S.D. or 1 IRC for a quantity of 4 labels.

Honour Roll (self adhesive) label.

W.I.A. members $1.25 Aus each. non-members $1.30 Aus each.
Overseas non-members - $1 U.S.D. or 1 IRC each.

DXCC Excellence (self adhesive) label.

W.I.A. members $1.25 Aus each. non-members $1.30 Aus each.
Overseas non-members - $1 U.S.D. or 1 IRC each.

3 & 5 Band Certificates – 2005. (sized A3)

Australia.

W.I.A. members new applications – free (1only).
Non-members new applications - $14.00 Aus.
W.I.A. members replacements - $12.00 Aus.
Non-members replacements - $14.00 Aus.

Overseas

non-members - $12.00 U.S.D. or 10 IRCs.
Special reduced pricing for 2 or more awards under 250 grams postage.
3 & 5 Band DXCC Certificates award attachments.
3 Band DXCC Progress award (self adhesive) labels, increments of 50. (350-1000).
5 Band DXCC Progress award (self adhesive) labels, increments of 50. (550-1200).
W.I.A. members 30 cents $Aus each. non-members 35cents $Aus each.
Overseas non-members - $1 U.S.D. or 1 IRC for a quantity of 3 labels.

Honour Roll (self adhesive) label.

W.I.A. members $1.50 Aus each. non-members $2.00 Aus each.
Overseas non-members - $2 U.S.D. or 2 IRCs each.

DXCC Excellence (self adhesive) label.

W.I.A. members $1.50Aus each. non-members $2.00 Aus each.
Overseas non-members - $2 U.S.D. or 2 IRCs each.

Postage: (all Certificates are sealed in a quality Postal cylinder)

All Certificates are sent via economy mail postage. (max. 250 grams)
Australia – Australia Post standard economy road mail delivery.
Overseas - Australia Post standard economy mail delivery.
For those that need urgent delivery the "extra rates" are shown below.
Airmail postage from Australia to:
Australia. $3.10 Aus.
New Zealand. $1.50 Aus , $1.25 U.S.D. or 1 IRC.
Asia, Pacific Ocean. $1.25 U.S.D. or 1 IRC.
Europe. $1.25 U.S.D. or 1 IRC.
Nth. America, Middle East. $1 U.S.D. or 1 IRC.
Sth. America, Africa. $1.25 U.S.D. or 1 IRC.

Please note:

We only accept $Aus, $U.S.D. and IRCs for payment of all fees.
IRC Postal Currency must be dated no further than 1 year or 12 months old when received by the W.I.A. and be official Post Office stamped and dated.

Postal correspondence (airmail letter rate)

Australia 50cents $Aus, overseas $1.50 U.S.D. or 1 IRC. No charges for email.

ar

VHF/UHF - an expanding world

David Smith VK3HZ - vk3hz@wia.org.au
Leigh Rainbird VK2KRR - vk2krr@wia.org.au

Weak signal

David Smith VK3HZ

The continuation of good weather conditions in the south of the country has resulted in a few slow moving high-pressure systems moving across, producing some good propagation. In particular, on the evening of April 19th, a High settled over central Victoria producing good conditions in every which direction. Of note, Rob VK1ZQR reports working VK7JJ near Launceston. Bob VK2TG in Sydney reports hearing VK7JC, but no contact was made. The following morning, John VK5PO in the Barossa Valley reports working Joe VK7JG.

On several other occasions during April, conditions to the east from Adelaide have been excellent producing many QSOs between the stations present.

EME

Further to last month's report, Alan VK3XPD has successfully completed the first Australia-Italy QSO on 10 GHz EME. On May 4th, Alan worked IQ4DF – the Bagnara di Romagna 10 GHz EME Group station – with operator Vico I4ZAU. IQ4DF runs 200 watts to a 7 m dish.

I was fortunate enough to be in the shack while Alan was having this contact. Alan uses a camera mounted on the dish to point at the moon, but unfortunately the day was somewhat cloudy. Fortunately, he had "found" the moon during a clear spell and was able to keep track of it by peaking on the moon noise. We were hearing echoes quite well, even in an SSB bandwidth, with the S meter even kicking upwards at times. I was somewhat surprised by how clear the signal was given what I've read about smearing of microwave EME echoes due to libration. Alan's station is GPS-locked and so he was quite confident that he was on the correct frequency – allowing for a Doppler shift of around 27 kHz. Sked time passed and nothing had been heard in reply to Alan's CQs. Finally, he tuned around and found IQ4DF calling up 10 kHz with a big signal – the S meter was definitely off the stop. Alan completed the QSO looking like the proverbial one-armed dishwasher, operating the manual PTT and key while having to tweak the dish position during the over and then correcting for changes in Doppler shift. After the CW QSO was over, IQ4DF then called on SSB and was given a 54 report. Alan received 51. All in all, a very impressive showing and it's good to see that Alan's hard work is now paying off.

Weak signal operating hints

Some months ago, there was a discussion on the VK-VHF reflector about operating techniques for VHF/UHF weak signal operation. I thought it would be good to pass these tips on and I thank Gordon VK2ZAB, Chris VK2DO and Chas VK3PY for these words of wisdom.

Apart from the obvious technical requirements of a good location, high power, low noise figure and big antenna, there are operational factors that play a big part in the success or otherwise of making contacts with weak SSB stations on the VHF/UHF bands. Many stations run the legal limit, so even though you can hear them OK on your barefoot rig (generally 50 watts), they may be receiving you at a level up to 10 dB less. Some operating hints, in no particular order:

[1] If the situation arises where you are called by two DX stations, always work the weakest one first. If conditions deteriorate, you may lose the weak station, but still be able to work the stronger one.

[2] Repeat YOUR callsign. The other station is familiar with their own callsign, and is much more interested in knowing what your callsign is. So use "VK3ABC, this is VK3XYZ, VK3XYZ, VK3XYZ over".

[3] Do not place too much faith in phonetics. Some letters need them (e.g. "H") and some probably do not (e.g. "Z"). Repeat your callsign both as letters and phonetically. Unless you're working a ZL station or similar, don't use phonetics for the "VK" part. And try to stick to phonetics that the other station will be familiar with – preferably the standard set. Making up your own phonetics will have the other station doubly confused as they try to guess what you're saying.

[4] Call for a reasonable time, to allow the other station to peak their antenna on you. Try to get your (well-known) location or gridsquare across so that the other station can determine your heading. You may be off the back of their beam, so be patient as their rotator grinds around.

[5] Whistle "K" at the end of your overs. As CW operators well know, CW will get through where SSB will not. For a very weak station, the whistled "K" will often be the only thing heard, but it does indicate you are there and have finished your over.

[6] For a valid QSO, you need to exchange callsigns, signal reports and acknowledgements. Therefore, don't slacken off after the callsigns have gotten through. You're only a third of the way there!

[7] Finally, more to do with operating etiquette, if a local station has just ended a CQ call, wait a reasonable time for any possible reply before calling CQ yourself. While you may not hear a station responding to the CQ, it doesn't mean there isn't one.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

The magic band – 6 m DX

Brian Cleland VK5UBC

The summer DX season is now well and truly over, particularly for the southern states. Other than the odd interstate contact and the occasional beacon breaking through the band has been very quiet. Since early March there have been very few openings except between VK4 and northern VK6 to Japan. The 6 m Logger indicates that Japanese stations are hearing various Northern Australian beacons on most days with a few contacts occurring between VK4s and JAs.

The only recent DX heard in VK5 was on 2nd May when the Toowoomba Chan 0 TV was S9+ and I worked Alan VK4ID. This is the only VK5 opening I'm aware of since 29th March.

Joe VK7JG reports that 6 m opened between 0328 and 0411 UTC on 25th April 2005 for the first time since 24 Feb. Stations worked included VK4WS, VK4AFL, VK2HO, and VK4CDI. At one stage the TV interference from CH0 Toowoomba was S9 across the whole band. Alan VK7AN was also active from his shack just south of Eddystone Point on the East coast of Tasmania where he also worked most of the above stations as well as a VK6 and from Hobart Ian VK7ZIF was among the DX.

A bit different if you live in far north Queensland as can been seen from the note I received from John VK4FNQ. John summarized his log from the 1st January and reports;

I've made 779 entries into the heard database, which also covers TV indicators out side VK.

Worked 196 stations on six on SSB since 01 January 2005 comprising:

VK1 – 2, VK2 – 24, VK3 – 8, VK4 – 23, VK5 - 11 (8 with VK5UBC), VK6, 7 & 8 – 0.

On the international scene John reports a total of 118 JA contacts have been made, 4 Korean contacts as follows, 10 March 6K2DHP, 12 March HL2FDA, 13 March HL2JFM and 13 April HL4GHT, 3 Chinese contacts as follows, 13 Mar BD9BA, 14 April BD4XA and BD9SI. Also 3 ZL contacts.

John also reports hearing the following,

FK8SIX/B 40 entries from 08/01/05 to 16/03/05 last heard

VK8RAS 16 entries from 11/01/05 to 16/02/05 last heard

VK8MS Mark only heard once 19/02/05

KH6SX on 09 Mar 2005.

From Perth John VK6JJ had a good day on the13th April with a good opening to Japan. John reports signal were up to S9 and that he worked 7 JAs, 4 on CW and 3 on SSB.

Information from the 6 m propagation logger indicates that on the 5th May JAs worked into northern VK4 & 6 and Gary VK4ABW worked KH6SX.

A good opening occurred between VK6 & 5 on the afternoon of 6th May. Both the VK6RPH (Perth) and VK6RBU (Bunbury) beacons were strong in Adelaide with VK5UBC working Peter VK6KXW and JohnVK6JJ (5/9+).

Please keep those 6 m rigs running during June as often good sporadic E interstate openings occur in this period.

Please remember to send any 6 m DX information to Brian VK5UBC at bcleland@picknowl.com.au. I can only report what I know.

Digital DX Modes

Rex Moncur VK7MO

Recently a few stations have reported problems in decoding FSK441 with WSJT. In most cases these have been caused by inadequate audio frequency response to cover the audio tones used by FSK441. The problems can often be traced to things like the use of too narrow an IF filter, the use of IF shift or the use of DSP notches or noise reducing systems. While such features can be valuable for SSB, it is best to let WSJT do all the filtering and keep the passband as wide as possible when using this program. This is something to remember in changing from SSB to WSJT. It is also possible that poorly matched interface units could limit the audio response.

WSJT includes a facility that tries to automatically compensate for variations in the audio response but it has limits and to my mind one should aim to keep the audio passband as flat as possible within the range of frequencies used by FSK441. While FSK441 uses tones of 882, 1323, 1764 and 2205 Hz one must in addition allow for sidebands as these tones are switched at 441 times per second. In addition one must allow for stations to vary in frequency and for Doppler shift due to the movement of meteor trails in the winds of the upper atmosphere. Taking all these factors I think one should look for a reasonably flat passband from around 500 to 2600 Hz. It is difficult to say what reasonably flat is but certainly 20 dB causes significant decoding problems and I would aim for less than 6 dB variation over the range 500 to 2600 Hz.

It is possible to use the program SPECTRAN that is packaged with WSJT to make a simple but accurate plot of the audio passband. First feed your receiver from a 50 ohm load to produce a white noise source and make sure there are no birdies. The procedure with SPECTRAN is as follows:

Under the "show controls" dialog box set SPECTRAN as follows:

Freq. Offset = 0

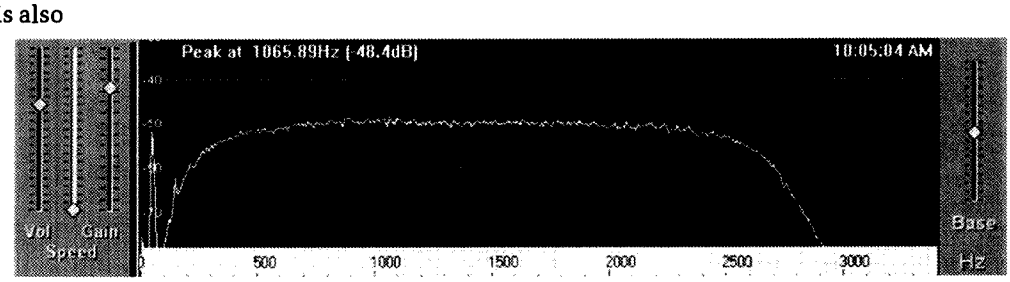


Figure 1

Resolution = 5.4
Avg Factor = 128
Sampling Rate = 11025
Tick Block Average
On the normal SPECTRAN Screen set:
Gain: to 5 marks from the top
Base: to around midscale or so you see the audio spectrum centred in the upper window.

Press the Average button so it highlights in Red

Start SPECTRAN and it will build up an average spectrum in about 30 seconds.

Figure 1 on page 49 shows an example average audio spectrum for the IC-910-H with its standard filter. It has dropped off by about 3 dB at 500 Hz and about 6 dB at 2600 Hz. You will also notice AC line spikes at 50 Hz and 150 Hz but these are sufficiently low in frequency so as not to be a problem.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

During April, the Canberra 146.950 repeater was the focus of some amazing DX activity from areas of VK2, 3, 5 and VK7. Remaining quiet in most other areas.

In the morning of 12/04, the first part of our Canberra repeater DX frenzy kicked off. The signal quality ranged from noisy to noise free with a slow QSB. Two of the first stations to realise the path to the Canberra repeater was there were George VK3HV in Morwell at 430 km, followed by Phil VK1PC who was actually mobile west of Hay, about 450 to 500 km out. Later in the morning, stations that I heard call in were Bruce 2AYM near Albury, 200 km; Ed VK3BG near Cobram, 290 km; Grant VK2AXB near Orange, 250 km; Ian VK3ZZG and Richard VK3JFK both mobile at Bendigo, 470 km; Ralph VK3WRE at Traralgon, 430 km and Bob VK3AQK, unknown location.

The Canberra repeater DX frenzy part 2 began in the evening of 20/04. Only a week before this I had been commenting that it had been at least 4 years since I had heard any DX from VK7 into the Canberra repeater, and what do you know, in it comes!

At 10.20 PM a call into the repeater by Peter VK7LCW started it all! Peter is located at Penguin on the Tasmanian north coast, 663 km from Mt Ginini 146.950. The rare DX call was quickly snapped up by Paul VK2ZPB not far from Canberra and Wayne VK2PDW in Wagga, also in came George VK3HV at Morwell.

At 11 PM, Phil VK7JJ then called into VK1RGI Canberra. Phil is at Weymouth, 625 km from the repeater and was punching a very good signal in and commented the repeater was 5/9+20 at his QTH. Shortly after midnight another amazing signal found its way into VK1RGI, that of John VK5PO at Eden Valley, an amazing 884 km from the repeater. John was able to speak with Rob VK1ZQR and also Phil VK7JJ. Rob VK1ZQR was able to work VK7JJ on SSB but could also hear Phil on FM.

The following morning 21/04, more amazing signals were heard into VK1RGI. John VK5PO was again getting to the repeater, albeit noisily at 11.30 AM. At 3 PM, Steve VK2UD was in on a 400 km path from Newcastle.

Later at 6.45 PM things were still happening when John VK5NJ in Mount Gambier got into VK1RGI over 756 km, and only running a 5/8 wave omni. At 7.15 PM, Ken VK3HKR just east of Melbourne made it in, as did George VK3HV. At 9.30 PM, VK5NJ was back, also Steve VK3TSR at Yarra Junction, 376 km.

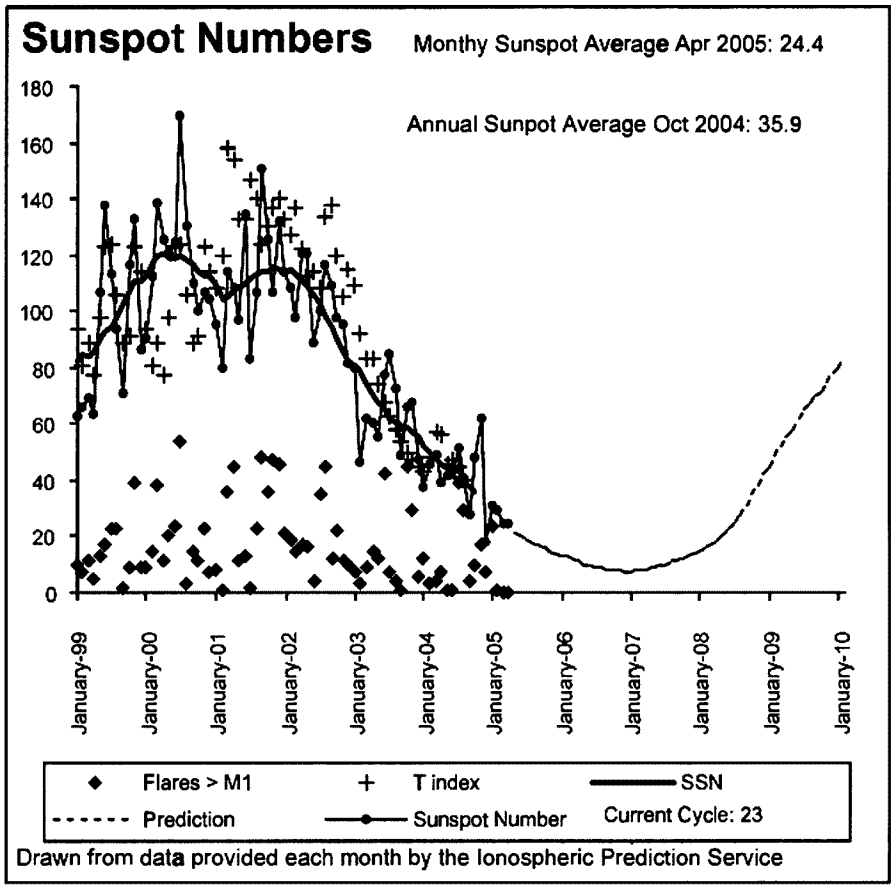
After 10.30 PM, more excitement when into VK1RGI came Peter VK2ZTV, Steve VK2UD and Peter VK2YPW all from Newcastle, they spoke to VK5NJ in Mount Gambier and also Craig VK3MCW in Colac, 556 km. Following this were Brian VK3BBB at Traralgon and Mark VK3HMB at Wangaratta.

A final short burst of life was shown from the duct in the early evening 22/04. I was surprised to hear a call into the Canberra repeater from Ian VK3IDL at Ballarat, 493 km. Then from Les VK3TEX at Kyabram, 346 km.

I have analysed the apparent cause of these conditions and found a high level duct around the Canberra repeater height, 1700 MASL, over Canberra, this dropped to lower levels around VK3, 5 & 7, but was still an unusually high duct (1000 m+) to still be workable from these areas.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au.

ar



Drawn from data provided each month by the Ionospheric Prediction Service

Are you managing the estate of a 'Silent key'?

Please save any QSLs for the National QSL collection, but first contact:

The Hon. Curator,
Ken Matchett VK3TL
on
(03) 9728 5350
or email
jeandawson@iinet.net.au

Rare DX, special call-signs prefixes and suffixes, pictorials and pre-war QSLs are needed.

Let us save something for the history of amateur radio.

Some suppliers of radio and electronics components

Drew VK3XU.

Australia-wide:

Altronics. Good general range of electronic components, test equipment, kits, books etc. Illustrated catalogue available. www.altronics.com.au

CW Operators' QRP Club. Friendly radio club for the experimenter/home-brewer. Offers - among other things, a 'Bits & Kits' mail-order service for members. www.users.on.net/zietz/qrp/club.htm

Dick Smith Electronics. Good general range of electronic components, test equipment, kits, books etc. Illustrated catalogue available. www.dse.com.au

Jaycar Electronics. Large range of electronic components, test equipment, kits, books etc. Strong on items for the hi-fi/electric guitar enthusiast. Some popular valve/tubes. Illustrated catalogue available. www.jaycarelectronics.com

RS Components. Mind-boggling range of electronic parts. Illustrated catalogue available to professional customers only. www.rswww.com.au

Farnell. As for RS Components above. www.farnell.com

Melbourne:

Electronic World. Small shop, but ample range of components. Can supply just about any part specified for Silicon Chip and past Electronics Australia projects. Telephone 03 9723 3860. www.electronicworld.aus.as

Radio Parts. Supplier of a large range of electronic components and test equipment. Illustrated catalogue available by subscription. Telephone 03 9329 7888. www.radioparts.com.au

Rockby Electronics and Computers. Good general range of electronic components and test equipment for the TV service person. Regular mail-out of many genuinely useful "surplus" items applicable to amateur radio at very low prices. Telephone 03 9562 8559. www.rockby.com.au

Semtronics. Good general range of electronic components, "computer" crystals, test equipment, kits, etc. Agent for Altronics. Telephone 03 9873 3555. www.semtronics.com.au

TTS Systems. Amidon cores, transmitting coils and capacitors and test equipment. Telephone 03 5977 4808. www.ttssystems.com.au

U.S. Mail-Order Suppliers:

Antique Electronic Supply. Purveyor of many supposedly hard-to-get items, such as (receiving) variable and mica capacitors, valves/tubes and sockets, RF chokes and high-voltage capacitors. Illustrated catalogue available upon request. www.tubesandmore.com

Digi-Key. Enormous range of electronic components. Illustrated catalogue available upon request. www.digikey.com

Mouser Electronics. Huge range of electronic components. Illustrated catalogue available upon request. www.mouser.com

Ocean State Electronics. Very good range of electronic and radio components, including variable capacitors (receiving and transmitting), 80/40/20 m crystals, NE-602s and many other QRP chips and semiconductors. Illustrated catalogue available upon request. www.oselectronics.com

Surplus Sales of Nebraska. Vends just about any item needed for the construction of big linear amplifiers and atu/couplers. Stimulating range of government/military surplus type items. Illustrated catalogue available at nominal cost. www.surplusales.com

plus* all the advertisers who support *Amateur Radio

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

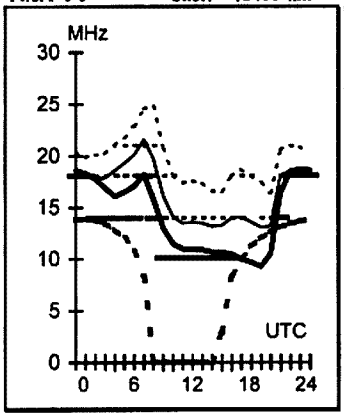
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

June 2005
T index: 25

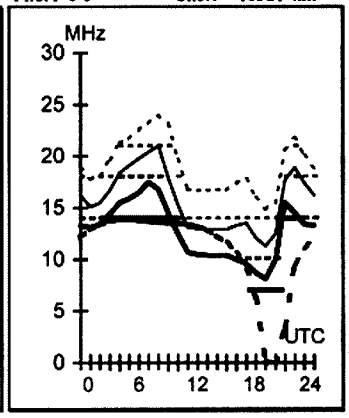
Legend

Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

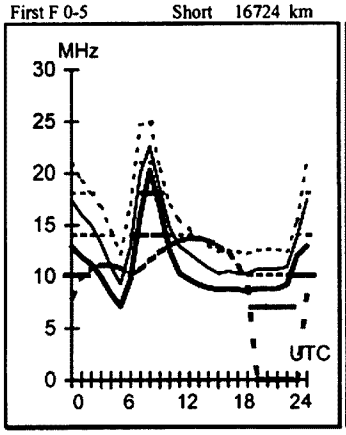
Adelaide-Achorage 30
First F 0-5 Short 12466 km



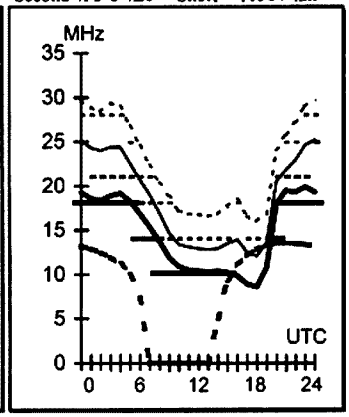
Brisbane-Berne 315
First F 0-5 Short 16321 km



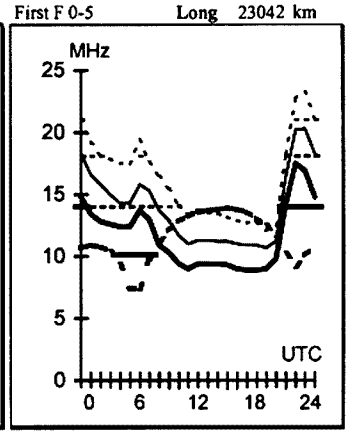
Adelaide-Dakar 233
First F 0-5 Short 16724 km



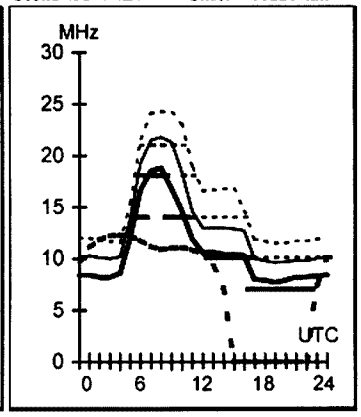
Brisbane-Los Angeles 69
Second 4F3-6 4E0 Short 11564 km



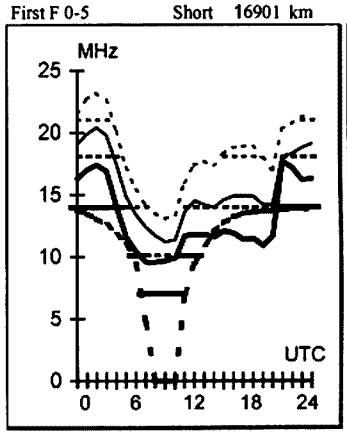
Canberra-London 136
First F 0-5 Long 23042 km



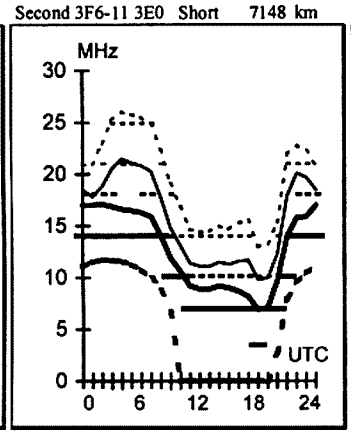
Darwin-Capetown 231
Second 4F3-4 4E0 Short 11221 km



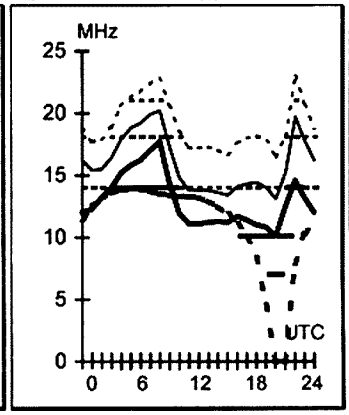
Adelaide-Ottawa 58
First F 0-5 Short 16901 km



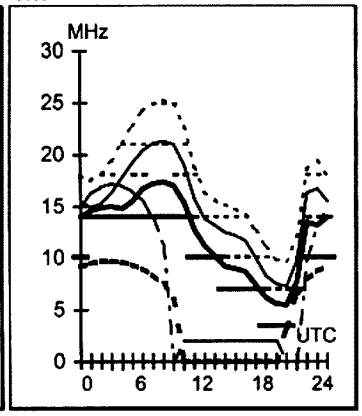
Brisbane-Osaka 344
Second 3F6-11 3E0 Short 7148 km



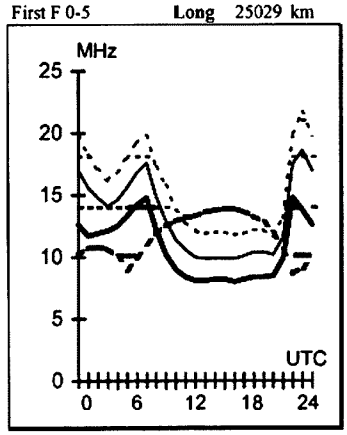
Canberra-London 316
First F 0-5 Short 16982 km



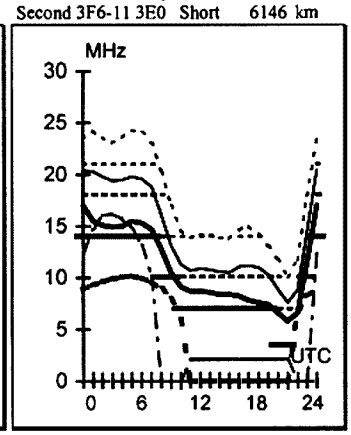
Darwin-Tokyo 10
Second 3F11-18 3E Short 5436 km



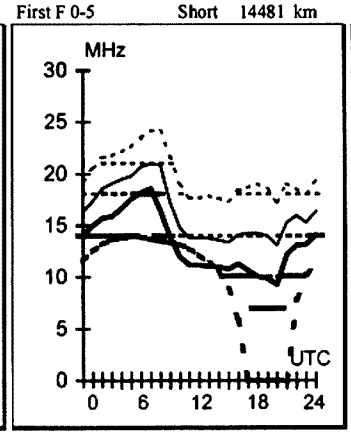
Adelaide-Stockholm 142
First F 0-5 Long 25029 km



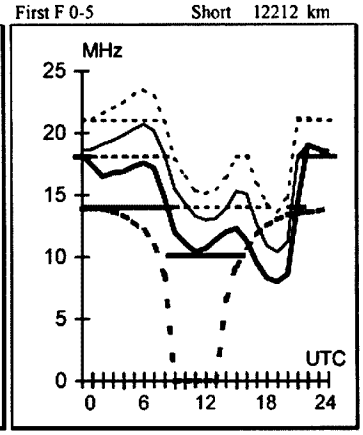
Brisbane-Singapore 293
Second 3F6-11 3E0 Short 6146 km



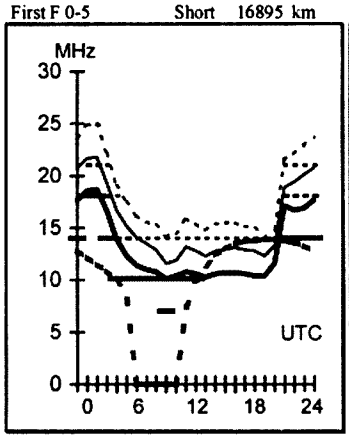
Canberra-Moscow 317
First F 0-5 Short 14481 km



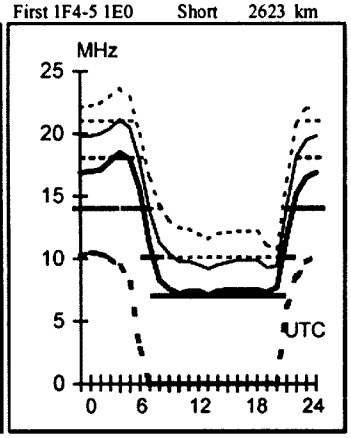
Darwin-Vancouver 42
First F 0-5 Short 12212 km



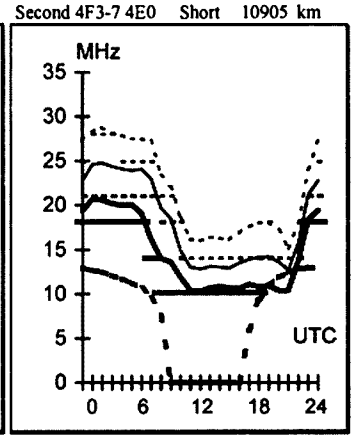
Hobart-Boston 78
First F 0-5 Short 16895 km



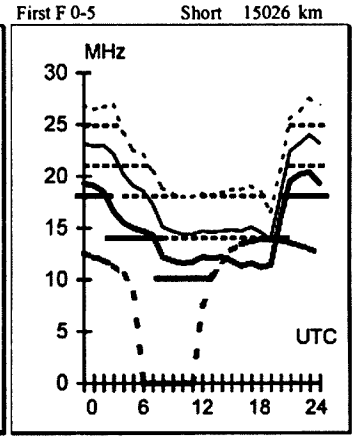
Melbourne-Auckland 97
First 1F4-5 1E0 Short 2623 km



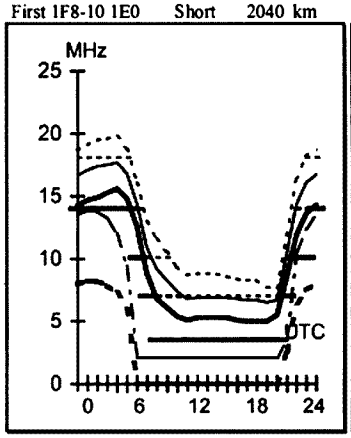
Perth-Honolulu 70
Second 4F3-7 4E0 Short 10905 km



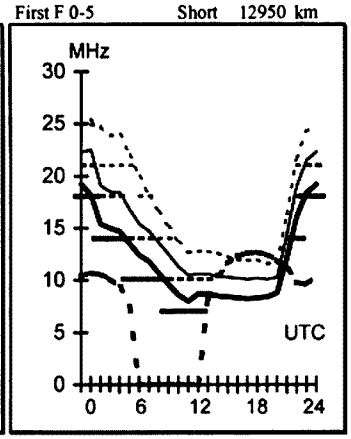
Sydney-Miami 86
First F 0-5 Short 15026 km



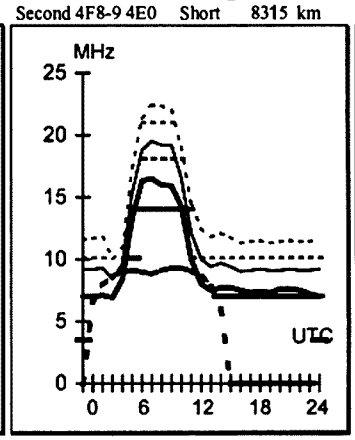
Hobart-Christchurch 101
First 1F8-10 1E0 Short 2040 km



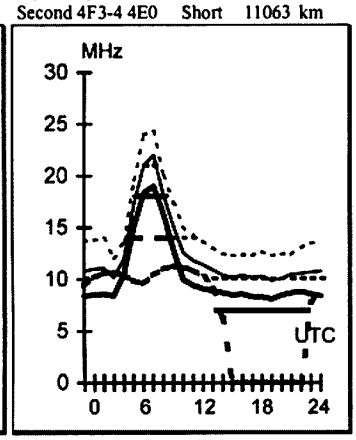
Melbourne-Lima 133
First F 0-5 Short 12950 km



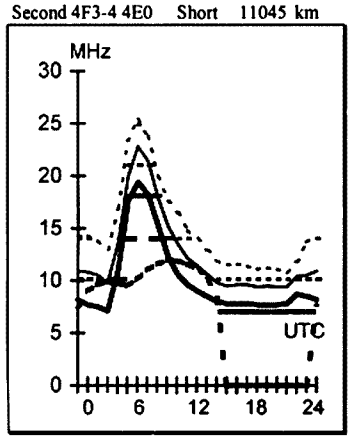
Perth-Johannesburg 248
Second 4F8-9 4E0 Short 8315 km



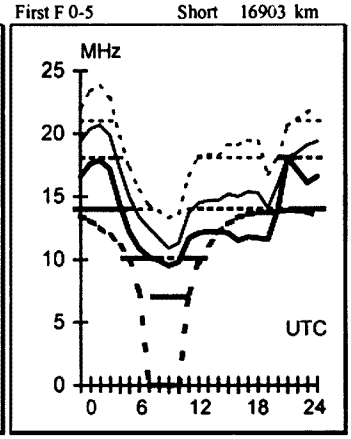
Sydney-Pretoria 230
Second 4F3-4 4E0 Short 11063 km



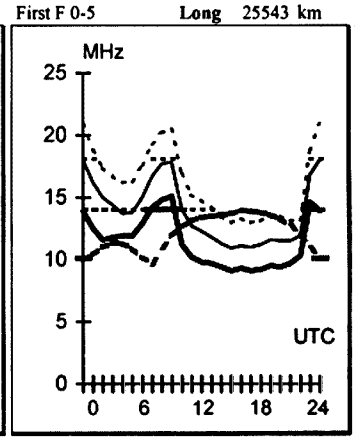
Hobart-Lusakar 239
Second 4F3-4 4E0 Short 11045 km



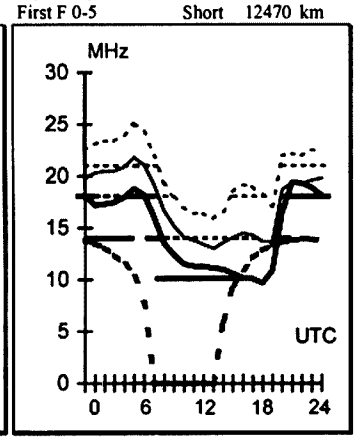
Melbourne-Montreal 60
First F 0-5 Short 16903 km



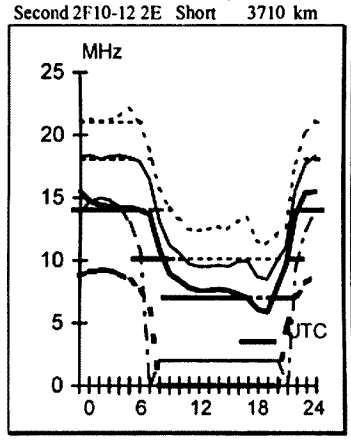
Perth-London 133
First F 0-5 Long 25543 km



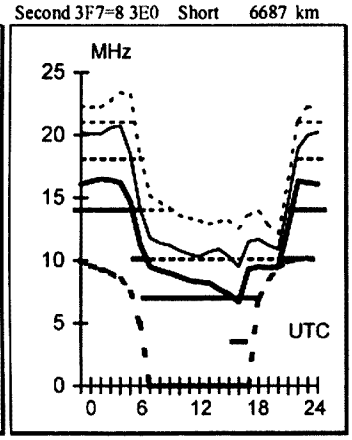
Sydney-Seattle 47
First F 0-5 Short 12470 km



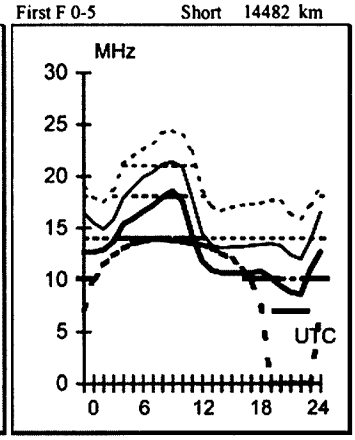
Hobart-Port Moresby 360
Second 2F10-12 2E Short 3710 km



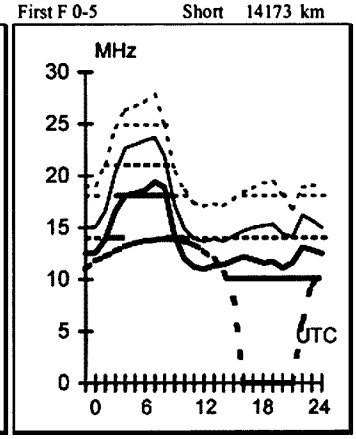
Melbourne-Papeete 90
Second 3F7=8 3E0 Short 6687 km



Perth-London 313
First F 0-5 Short 14482 km



Sydney-Tel Aviv 287
First F 0-5 Short 14173 km



Hamads *classifieds* FREE

FOR SALE NSW

•Tathra, far South Coast NSW D Ham shack with comfortable four bedroom, two bathroom home, ensuite to main bedroom, 180 deg. ocean view, four minutes walk doctors and bus, ten minutes shops and boat ramps, large block $395,000 ONO. Ray VK2AWQ QTHR Phone 02 6494 1347.

•Yaesu TRX FT-7 (two) manuals $220 each. Yaesu complete station TRX FT-757 tuner (auto) FT-757AT power supply FP-752 HD manuals $1500, all exc cond. and working. John VK2BES Kiama NSW, Phone 02 4232 2842, email vk2bes@tpg.com.au.

•Yaesu FT-817 s/no 10200168 Rx 100kHz to 30 MHz, Tx all bands 1.8 to 432 MHz 5 watt PEP o/p, reqs 13.8 VDC with o/manual, mic, DC cable and portable ant. 6, 2 and 70 cm in VGC $800. Tokyo Hy-power HF Linear amp HL-200E s/no 8450614. 4 to 15 W drive for 130 plus watts o/p. 13.8 VDC in VGC $300 or $1000 for both units. Incl. postage if both. Gordon VK2PO QTHR, Phone 02 6569 6329.

•Kachina 505-DSP HF transceiver with software, manual and mike, price $1500. Wilson System SY-1 2kW widely spaced 4 element 3 band beam, price $350. Dentron MT-2000A 2kW ATU, price $350. Bird model 8133 dummy load, N-type connector, price $70. Tom, VK2OE@arrl.net, Phone. 0413 796 851, 7-9 pm.

•Levell Decade audio oscillator TG-66A, 0.2 Hz to 1.22 MHz pure sine wave, calibrated output, a precision instrument from Levell in the UK. Internal battery or AC operation, s/n available. QTHR Tony VK2BOA Phone O2 4943 8981.

•YAESU FP-301 power supply $120 +P&P. Maurie VK2OW. Phone 02 9838 1834. Email: maurieh@acay.com.au.

•1 only Yaesu FC-901, 500 watt antenna tuner. $200 posted. No phone calls thank you. Emails to vk2amm@netcentral.com.au .

•Deceased Estate VK2EWP Icom IC-751 HF XCVR inc handbook s/n 04970 vg order. Icom IC PS-15 p/supply s/n 19476. Kyokuto-Denshi FU-144-105xr11 2m XCVR s/n5810. Yaesu FC-707 Antenna tuner s/n 1N180206. Panther 4amp P/supply. H/Duty low pass TV filter Mod 150. J W Miller-Bell Ind Low pass filter 1000w/2000w PEP SB Model C-514-T. Sidewinder RF Signalizer M-10 +/-15db. Kenpro KR-400 Rotator + Control + Manual. Kenpro KR-400 rotator (No controller or manual) What offers? Ron VK2GPS QTHR Phone 02 9525 8035 or vk2gps@hotmail.com.

WANTED NSW

•About 200 watt solid state linear amplifier for the amateur bands. No phone calls thank you. Emails to vk2amm@netcentral.com.au

FOR SALE VIC

•Truckload post-war radio stuff. Early recorders sets with broken cabinets record players etc $10 lot. Early diathermy table unit make linear 810 P/S $40 VK3DS QTHR Phone 03 5332 3226.

WANTED VIC

•Information on 1155B - English aircraft receiver. Phone 03 9376 3076 Fred.

•Morse reader program tape for old Commodore 64 computer. VK3DS QTHR.

•Yaesu desk microphone type YM-34 or YM-38. Bill Jamieson VK3HX QTHR, Phone 03 9807 9172

•Kenwood TS-120V circuit/handbook. Will pay all costs for copying and post. VK3YAZ QTHR Phone 0417 014 636.

WANTED QLD

•Icom W-21AT for parts only Phone 07 3879 7968 or vk4aok@iinet.net.au

•A Winradio computer receiver card to be used in an old computer. Keith VK4APQ. Phone 07 4159 3292. QTHR. kaygee@interworx.com.au

MISCELLANEOUS

• The WIA QSL Collection requires QSLs. All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

TRADE ADS

PSK-31, SSTV, RTTY SOUNDBOARD Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

About hamads....

- Hamads may be submitted by email or on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newunltd@bigpond.net.au* **Fax:** *03 9756 7031*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

ADVERTISERS INDEX

AEI	27	Ozgear	9
Andrews	29	TTS	8
Benelec	IFC	Small ads	55
Com-an-tena	16	VK Discounts	55
TET-Emtron	17	Winlink	35
G & C	23	www.vk3ajj.com	55
Icom	OBC		

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: ★ **$ 75 for full members (F grade),** ★ **$ 70 for pensioners and students (G and S grade), and** ★ **$ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jlmac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@charlot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

WIA World wide AWARDS PROGRAM Certificates

'see Awards column on page 40

ICOM'S GREAT CHAMPIONS

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706.

Now includes 70cm @ 20W and 50W on 2m
Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch Detachable Front Panel (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied:HM133

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM
Wideband receive 495 KHz - 1 GHz
555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

ICOM

PH416_AM02

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

find your nearest ICOM dealer at

www.icom.net.au or (03) 9549 7500

Volume 73 No 7
July 2005

Amateur Radio

$6.50
incl GST

WIRELESS INSTITUTE OF AUSTRALIA

The magazine for AUSTRALIAN radio amateurs, men and women

Women ~ active in radio

continuing

VHF and microwave propagation characteristics of ducts

Andrew L Martin, VK3KAQ

A miniature variable DC supply

Jim Tregellas VK5JST

Unravelling the mysteries of connecting radios to antennas

Brian Clarke, VK2GCE

9 770002 685079 07

BENELEC

YAESU

A Portable for All Situations....

VX-1

2m/1w
70cm

$336.90

Size (WxHxD)
47 x 81 x 25

VX-2

2m/1.5w
70cm

$358.10

47 x 81 x 23

VX-5

6m/5w
2m
70cm

$499.80

58 x 87 x 28

VX-6

Waterproof Jis7

2m/5w
70cm

$515.00

58 x 87 x 30

VX-7

6m/5w
2m
70cm

$723.00

60 x 90 x 28.5

FT-60

2m/5w
70cm

$397.80

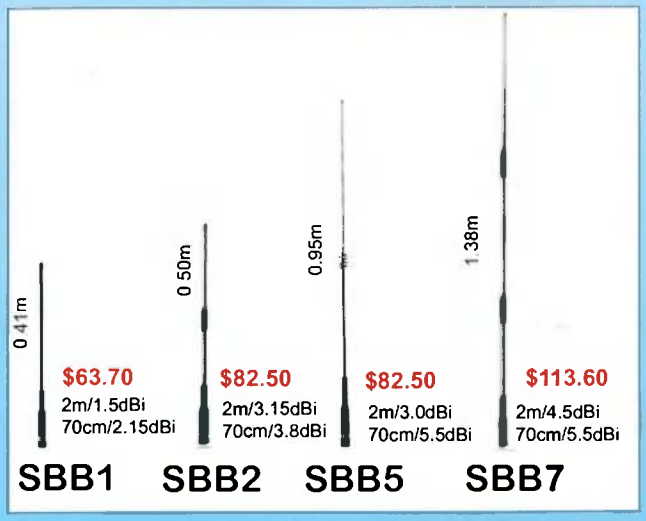
58 x 109 x 30

VX-150

2m/5w

$299.90

58 x 108.5 x 26.5



SBB1 $63.70 — 2m/1.5dBi 70cm/2.15dBi

SBB2 $82.50 — 2m/3.15dBi 70cm/3.8dBi

SBB5 $82.50 — 2m/3.0dBi 70cm/5.5dBi

SBB7 $113.60 — 2m/4.5dBi 70cm/5.5dBi

CHA250B
Broadband HF Vertical Base
(No Radials required!)

Amateur Bands Covers: 6,10,12,15,17,20,30, 40 & 75/80 Metres
Transmit Frequency Range: 3.5 to 57 MHz
Receive Frequency Range: 2.0 to 90 MHz
Transmit Power Rating: 250W SSB & 125W FM
Impedance: 50 ohms
Wind Survival: 108 Kmph
Maximum Height: 7.13m
Mounting Pole Dia: 28~54mm
Weight: 3.20 Kg
Country of Origin: Japan

$752.00

173808 $57.90
Low Pass Filter 150W

1738089 $104.10
Low Pass Filter HF 1K PEP

173810 $57.90
Low Pass Filter HF 150W

10109A $57.50
5m Cable, UHF M Base & Plug

Benelec Approved Amateur Transceiver Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosound.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
sales@strictlyham.com.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

Ozhelp Services
Tel: 07 3273 7263
sales@ozgear.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8285 2400
brenton@posnav.com.au

Radio Specialists
Tel: 08 8298 3906
rfwizard@optus.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 7
July 2005

The Journal of the Wireless Institute of Australia
ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Women in radio 28
Christine Taylor VK5CTY

How to write for *Amateur Radio* magazine 50
Bill Roper VK3BR

TECHNICAL

Unravelling the mysteries of connecting radios to antennas. Part 4.Baluns: design and construction 5
Brian Clarke, VK2GCE

A miniature variable DC supply 13
Jim Tregellas VK5JST

VHF and microwave propagation characteristics of ducts. Part 2 20
Andrew L Martin VK3KAQ

Another DC to DC converter for laptop use 38
Warren Stirling VK3XSW

COLUMNS

ALARA 32
AMSAT 35
Awards 40
Beyond our shores 34
Contests 40
Directory 56
DX~ News & Views 33
Editorial comment 2
Hamads 54
HF predictions 52
Silent keys 12, 31
Sunspots 27
Spotlight on SWLing 49
News from...
VK4 30
VK7 31
VHF/UHF – an expanding world 47
WIA comment 3
WIA news 4

Our Cover this month

Front cover shows Tina VK5TMC and Lesley VK5HLS operating the Adelaide Hills Amateur Radio Society John Moyle Field Day station in March 2005. The station was set up on the property of Geoff VK5TY and Christine VK5CTY near Swan Reach. See *Women in Radio* article on page 28

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

June Fox/Judith Oliver	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
Assistant Treasurer	Bruce Bathols	VK3UV

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	Glenn Dunstan	VK4DU
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glenn Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

A helping hand for old-timers

The year is now half over and we have a moment to look back and look forward. There are some things I planned to do and have done and some I still need to do. I also have to ask if they still need done!

I received a letter recently which discussed the plight of amateurs who have to move into retirement complexes or similar and due to the establishments rules are no longer able to erect aerials and operate transmitters. Some may be fortunate enough to be allowed to but are not longer physically able to do the work. It was suggested that radio clubs might consider having Old Timers Nights when these amateurs who could not set up a full station could be brought to the club rooms and operate the club station. The other problem could be solved with a "Help team" who would be able to visit amateurs with problems setting up a station and sort out how a station could be set up for the amateur to continue to enjoy his or her hobby.

Another topic that came up was with the level of detail we include in articles. Now while we do have members with tertiary degrees, and we do have amateurs with technical diplomas and we do have amateurs who are computer whizzes, we also have a lot of amateurs who have no formal training in electronics, radio, physics, mathematics, electrical engineering or computing other than what they learnt to get a licence and in using that licence. So articles in AR are pitched at a general level group who know a bit more than the unrestricted licence requires but are not of a level to be submitted to the Journals of the IEEE. I am sorry if this makes some people think we are only writing for the least able. We are not. We aim to provide material which all can use, learn from or construct. Those who require more have access to libraries and the Internet to learn more.

I also had a letter suggesting that the Aerial Analyser would give incorrect answers if used in a particular way. However the author confirmed this was outside the scope of the instrument which was a low cost aid to set up aerials and as you got closer to the proper 50 Ω match, the answers became more accurate. If you want more you have to pay for it.

The Remembrance Day contest is nearly upon us. This year there has been a revamp of the contest scoring so please read the rules on page 43 carefully. We thank the retiring RD Contest manager Alek Petkovic, VK6APK for the work he has done to keep this contest running and wish Chris Edmondson VK4AA all the best is keeping up the high standards of this, the premier Australian home contest.

We apologies to Rodney Champness whose OTU letter page 44 on the June AR on BPL interference lost his name as the author in the production process.

VK5UE

Are you managing the estate of a 'Silent key'?

Please save any QSLs for the National QSL collection, but first contact:

The Hon. Curator,
Ken Matchett VK3TL
on
(03) 9728 5350
or email
jeandawson@iinet.net.au

Rare DX, special call-signs prefixes and suffixes, pictorials and pre-war QSLs are needed.

Let us save something for the history of amateur radio.

Michael Owen VK3KI

A generous bequest

I never met Henry Gustaf Andersson.

But since his death I have learnt something about him.

Henry Andersson was VK8HA. He was born in Sweden and came to Australia many years ago.

Henry's wife predeceased him some 10 years ago.

Henry built his house at 30 Trippe Road, Humpty Doo in about 1988, on some 5 acres of land. Humpty Doo is on the Arnhem Highway, a few kilometres from the Stuart Highway, in all some 40 minutes or less drive from central Darwin. The township itself has a shopping centre, with even a Woolworth's supermarket.

Henry erected three antenna towers on his land.

There were two other amateurs in the Northern Territory who had come from Scandinavia with a similar background to Henry and who were among his real friends. One was Karl, VK8CAW from Darwin, and the other was Len, VK8DK, from Tennant Creek. I have met them both, and we have talked of Henry.

Henry was an Honorary Life Member of the South Australian and Northern Territory Division, and had immediately become a member of the national WIA when he was invited to do so.

Henry set up and ran the VK8 QSL Bureau for some 38 years.

The late Peter Naish's wonderful description of Henry described his passion for CW operating, mainly on the HF bands of 14/21/28 MHz and that his was always an outstanding signal. His QTH of Humpty Doo, a curious name, became a familiar name to the DX fraternity who never quite knew where it was or what it meant.

Henry became a member of the First Class Operators Club (FOC) in 1970. Membership of FOC is reserved for those who can display exemplary CW operating skills and is by invitation only. At any one time there are only 500 members worldwide.

He was the Federal Intruder Watch Coordinator, and had been appointed National Intruder Watch Coordinator when the new WIA Board met in May 2004, its first meeting after the adoption of the new Constitution, and all the appointments made at the Annual General Meeting that adopted the new Constitution were confirmed.

The purpose of the Intruder Watch program is to discourage and remove stations that are not amateur stations from those parts of the radio spectrum that are allocated exclusively to amateurs. Because, in the end, only a country can stop a station transmitting in its territory without regard to the international table of allocations, it is a slow and often unrewarding task.

It requires skill to identify the intruder and patience to persist when there is not much response to the report, with the knowledge that what you are doing may at least discourage some stations from transmitting on the small and vulnerable amateur HF bands.

As I said recently, when we celebrated the 100th birthday of Alf Chandler, VK3LC, it seems that only special and truly dedicated people take up this task.

He resigned that position in around August 2004, as his health failed and he could no longer perform the function adequately.

He died on 5 October 2004.

On 22 August 2004 Henry signed his will.

It had been written by Henry himself, using a will kit. His will left his "house and lands" to the WIA, and "all personal family effects, Jewellery and Photos", and residuary estate to his only relative in Australia, the widower of his wife's sister.

He appointed the Public Trustee his executor.

So the WIA inherited Henry's land and house, and the WIA Board believed the only option open to it was to sell the property as quickly as it could.

The WIA has been greatly assisted by Karl Warchot, VK8CAW, who assisted the Public Trustee by identifying and selling any of Henry's equipment that was of any value.

A real problem facing the WIA in handling the Estate was that it needed someone in Darwin to help, for example by arranging insurance, arranging cleaning of the premises and the removal of what was not required (including the three towers) and generally to be "on the spot".

Garry Woods, VK8GW, willingly undertook this task.

In the end, the WIA will receive just over $250,000 after meeting expenses when the sale is settled in mid July.

I am greatly moved by the generosity of Henry Andersson. He was a real amateur and a real supporter of amateur radio.

His generous bequest during this period of change, as we work to create a single national body, gives us great hope and great confidence, because it means that we have some reserves that at least give us confidence.

As I say, I never met Henry.

But we must make sure that we do not forget Henry Gustaf Andersson, VK8HA, SK.

ar

Plan ahead

Remembrance Day Contest
13 & 14 August

ALARA Contest
27 & 28 August

WIA news

New WIA membership category Introduced

Following the WIA Board meeting in Sydney on 8 and 9 April 2005, it was announced that a new category of membership, "Family Membership", would be introduced.

A Family Member is a second or further person living at the same address as a Member or Concession Member receiving AR. A Family Member does not receive AR, and membership only costs $40 a year.

The new Family Membership was offered for the first time at the WIA stand at the Oxley Region Amateur Radio Club 30th Anniversary Field Day Weekend at Port Macquarie on 11 and 12 June 2005.

Some 15 new members joined the WIA over the weekend, including 3 Family Members.

Family Membership is a way the whole family can support the WIA.

The new Membership Application Form is now on the WIA web site, with provision for not only Family Membership, but also 5-year membership.

WIA office delays

As a result of the reorganisation of the WIA office, with Judith Oliver taking over from June Fox, the installation of new equipment and software and illness, some delays have continued in a number of functions undertaken by the office.

Every effort possible has been made to keep the exam function up to date.

However, WIA President Michael Owen announced in early June that there would be a couple of weeks delay before the renewal notices for July will be sent out. July renewals account for nearly half the WIA's total membership, and are usually posted in early June.

This year, the renewal notices are in a new form. They will be generated by the new membership management software and offer renewals for 5 years.

However, because of the requirement that the WIA fully test the new system before going "live", the July renewals will not be posted until early July.

So, please don't worry if you haven't received your renewal notice as early as you usually have received it, it will come and AR will also keep coming.

And when you do receive it, please think about renewing your membership for 5 years.

Alf Chandler, VK3LC, 100 years old

On 30 May 2005 the Moorabbin and District Radio Club conducted a special celebration to honour the 100th birthday of Alf Chandler, VK3LC, attended by many of his friends, the Mayor of the City of Kingston, Topsy Petchy, Jim Linton, VK3PC, President of Amateur Radio Victoria and Michael Owen, VK3KI, President of the WIA.

Michael presented Alf with his WIA Honorary Life Member certificate and badge.

Channel 9 covered the event in its news that evening.

The new amateur licence structure

On 4 May 2005 WIA President Michael Owen, VK3KI, announced that the WIA had been advised by the ACA that it was then anticipated that the Outcomes of the Review, originally promised for early 2005, including the new licences, would not be able to be introduced before "the third quarter of 2005".

A few days later, on 7 May, at the Open Forum associated with the WIA Annual General Meeting, the members present unanimously passed a resolution expressing their concern, and requesting the ACA to introduce the new Foundation Licence and the new licence privileges without further delay and in any event not later than 30 June 2005

On 10 May 2005 the President wrote to the Acting Chair of the ACA, conveying these concerns, and suggesting that other changes to the LCD could follow the changes to introduce the new licence structure.

On 26 May 2005 a response was received from Dr Bob Horton, Acting Chairman of the ACA.

After expressing his regret at the delay, Dr Horton wrote:

"In order to expedite the introduction of the core elements of the new licensing arrangements, the ACA has already taken steps to implement the Review Outcomes in two phases. The first phase will involve the minimum change necessary to introduce the Advanced, Standard and Foundation Amateur licences. All other changes including the class licence that will allow overseas visiting Amateurs to operate in Australia without the need to apply for individual licences, will be implemented in the second phase.

I am aware that the WIA continues to contribute significantly towards ensuring the successful introduction of the new licence categories. On behalf of the ACA, I would like to thank the WIA for this contribution.

Although the two phase procedure will enable the ACA to introduce the three new amateur licences in the quickest time practical, it is still not possible for the ACA to guarantee that the changes will be introduced before 30 June 2005."

Good news for US amateurs on BPL interference.

Motorola has announced the development of a new BPL delivery method that it claims greatly reduces the potential interference to amateur radio stations.

The ARRL, which cooperated with Motorola from the start in the development of the system, reports that the semiconductor manufacturer was 'all ears' when it came to avoiding interference to radio amateurs.

Named "Powerline LV", the new system is quite different from current North American BPL systems, as it only uses the local low voltage power line from the transformer to the home to deliver the BPL signal, using a "Homeplug" type format. The long haul distribution of the BPL signal which was previously achieved using the medium voltage power lines, is now achieved in the Motorola system by wireless. The long haul medium voltage distribution of BPL was found to be the major radiating component in US trials.

Unfortunately, the Australian and New Zealand power distribution systems are very different from the North American

continued on page 27

Unravelling the mysteries of connecting radios to antennas. *Part 4.*

Brian Clarke, VK2GCE
brianclarke01@optusnet.com.au

Baluns: design and construction

Some balun design considerations.

There are four major concerns in constructing baluns/ununs:

1. output impedance;
2. turns ratio and impedance ratio;
3. construction materials and methods; and
4. power handling capability.

Each of these factors is discussed below.

Output impedance

In some literature, you'll find reference to current baluns/ununs and voltage baluns/ununs. What is really referred to is output impedance. If you use a balun to feed the centre of a balanced half-wave dipole, a low impedance balun would be used and it would be called a current balun. If you use an unun to feed the end of a half-wave antenna, it would be a high impedance device and be called a voltage unun.

Some typical applications, and (approximate) output impedances are:

- Multi-parasitic Yagi-Uda – perhaps as low as 5 Ω
- Simple Yagi-Uda with just three elements – 18 Ω
- Quarter-wave vertical over horizontal ground-plane – 36 Ω. (eg, car roof VHF and UHF whips)
- Quarter-wave ground-plane with radials drooped 135° – 50 Ω
- Horizontal dipole 0.18λ above ground – 50 Ω
- Well-isolated horizontal or vertical resonant dipole – 72 Ω
- Off-Centre-Fed antenna – 150 to 1000 Ω depending on feed-point location
- Five-eighth-wave vertical – 200 Ω
- End-fed Zeppelin – 1000 to perhaps 5000 Ω

The impedances quoted for the first five examples above are at the fundamental resonant frequency – the impedance will be different (usually higher) for other resonant frequencies. A balun/unun works best into constant impedance. And you get the highest energy transfer efficiency when the output impedance of the balun/unun matches the feed impedance of the antenna (Jacobi theorem). If you intend to use just one balun/unun for multi-band operation, design the device for the highest output impedance because then all the other impedance requirements will result in a lower input voltage, which will not stress the magnetic design.

Turns ratio and impedance ratio

We know from Lenz's law that, until we approach saturation in the magnetic circuit, voltage is directly proportional (by the factor 'k') to the number of turns (N). If we denote the primary with subscript 1 and the secondary with subscript 2, we get:

$$R_1 = V_1 / I_1 \ \& \ R_2 = V_2 / I_2 \quad (1)$$

$$V_1 = kN_1 \ \& \ V_2 = kN_2 \quad (2)$$

$$I_1 = k/N_1 \ \& \ I_2 = k/N_2 \quad (3)$$

(Equations 3 follow directly from Ohm's law; ie, current is inversely proportional to voltage in a constant impedance circuit. And factor 'k' is the same in all equations because the magnetic circuit is common to all.)

If we now set equations 1 as a ratio, we get:

$$R_1 / R_2 = V_1 I_2 / V_2 I_1 \quad (4)$$

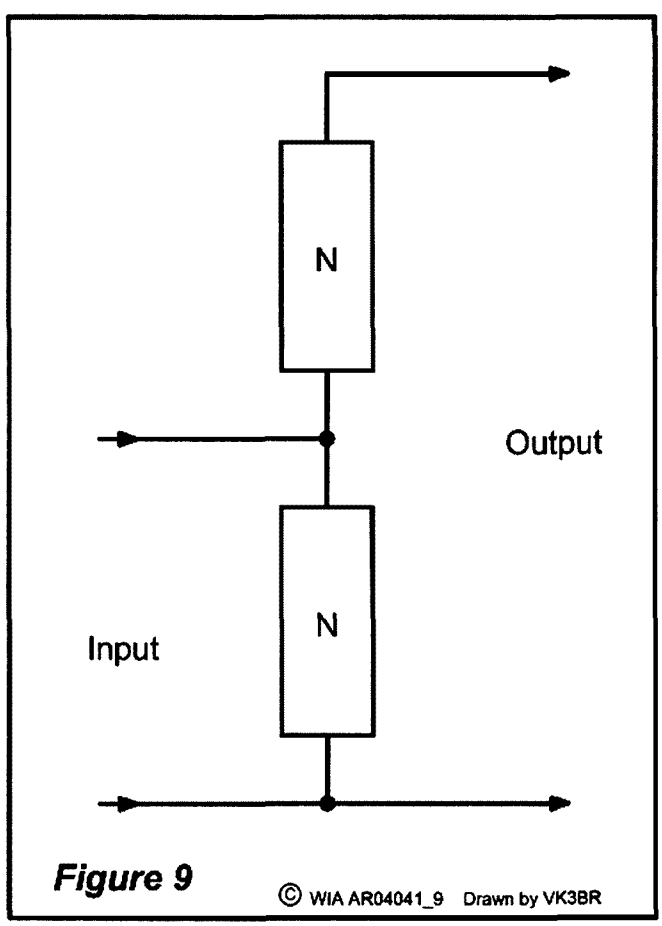


Fig 9. A 4:1 unun auto-transformer.

Substituting both equations 2 and 3 into equation 4, we get:

$R_1 / R_2 = (kN_1k / N_2) / (kN_2k / N_1)$

$= (N_1/N_2)^2$

Or, in words, the primary to secondary impedance ratio is equal to the square of the turns ratio.

In Figure 9 we have an unun with an N-turn primary and a 2N-turn secondary. It is an auto-transformer design because the primary and secondary have one common lead, and neither the input nor the output can be balanced. This design is easily realised by winding two conductors in parallel, also known as bifilar wound. The impedance ratio, primary to secondary, is 1: 4.

How could we make this into a 1:1 unun? It just requires a slight rewiring as shown in Figure 10.

Though the foregoing are both auto-transformer designs (because the primary and secondary have a common connection), an unun doesn't have to be an auto-transformer. For example, consider Figure 11.

If the primary and secondary are wound as two parallel conductors (bifilar wound), this would be a transmission line transformer. If the primary and secondary are both unbalanced, it would be a unun – and if both primary and secondary are balanced, it would be a balbal. You can work out what a balun might be.

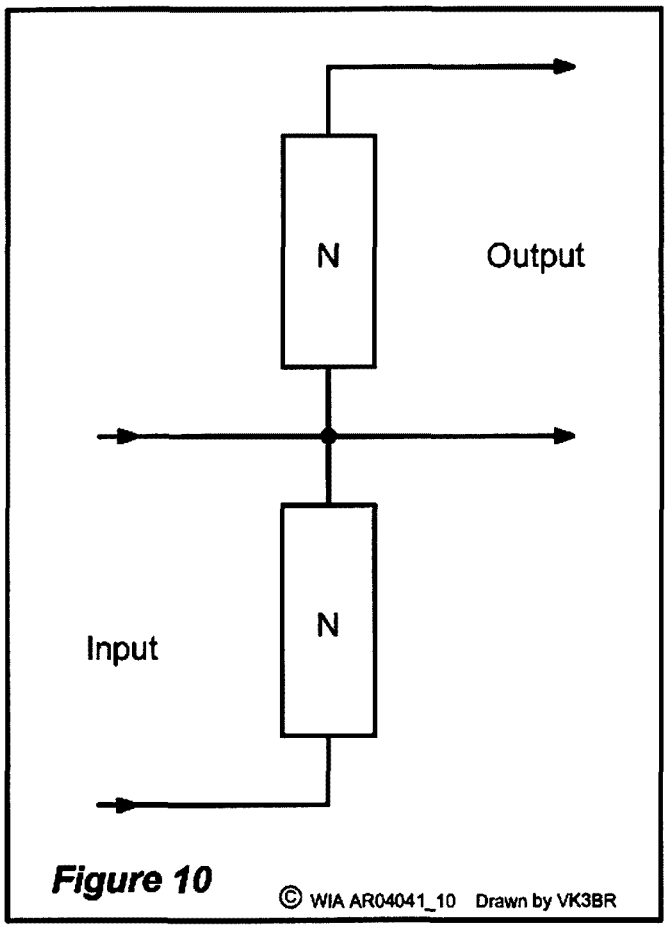


Fig 10. A 1:1 unun auto-transformer.

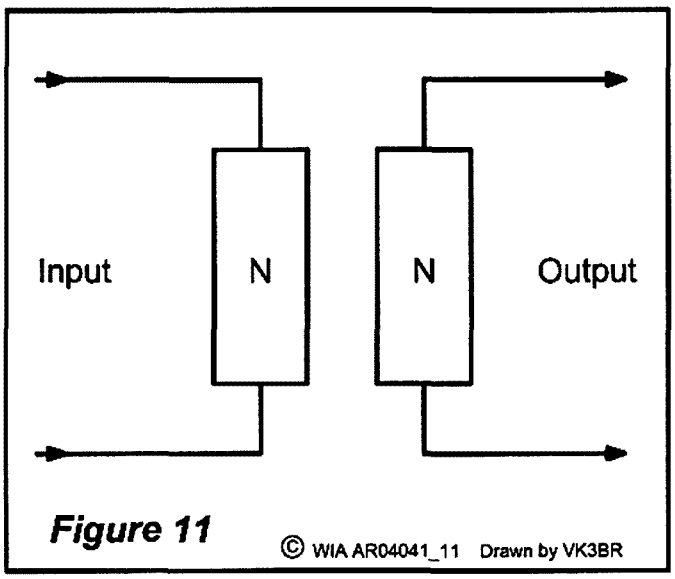


Fig.11. A 1:1 transformer isolated input and output

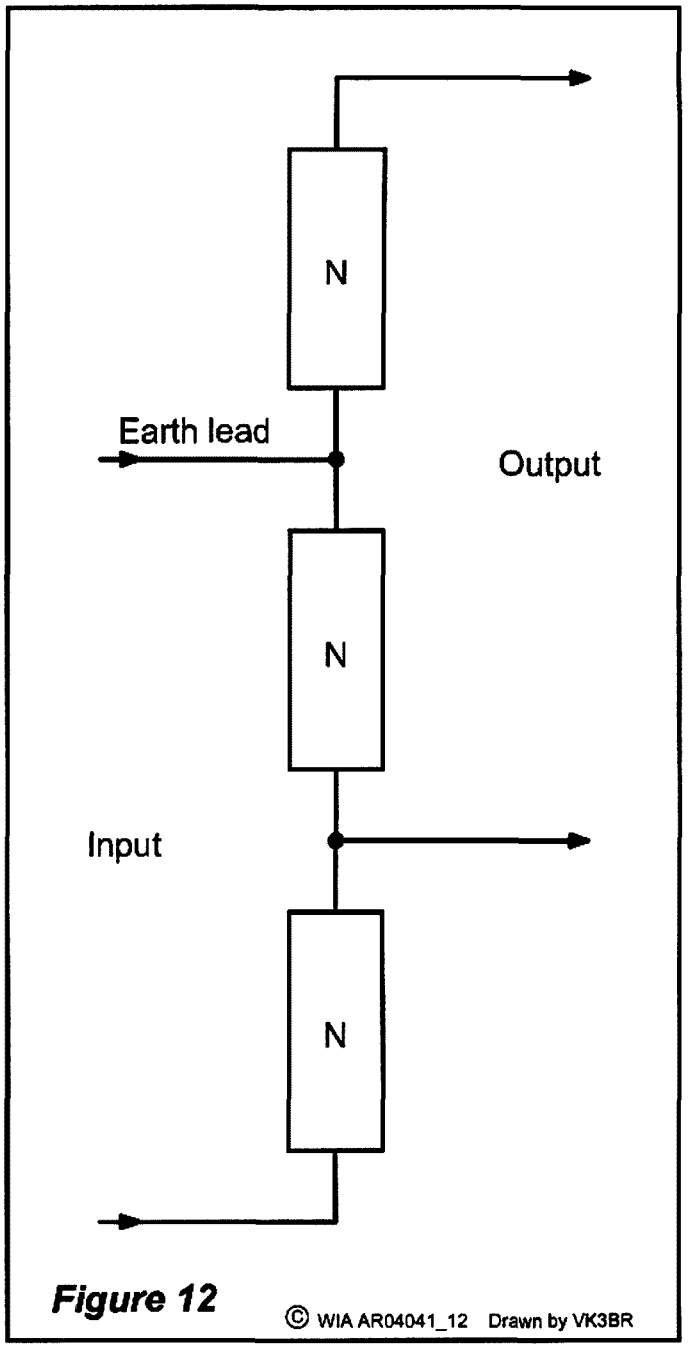


Fig.12. A 1:1 balun with common leads

How about a 1:1 balun with common leads? See Figure 12.

This is realised as a trifilar wound auto-transformer, but now the output is balanced with respect to the upper input lead (labelled Earth). However, it is not an isolated design, because of the common connections. So 'balanced' does not imply isolation of output from input.

Other impedance ratios can be realised by going to quadrifilar winding or even higher. Alternately, as with mains transformers, we could wind different numbers of turns on our primary and secondary. But if we do this, we need to be careful that the total length of the wire on one of the windings does not approach $\lambda/2$ – the frequency at which this occurs will have zero output. So, we need short windings. In general, the impedance ratio equals the turns ratio squared, as shown above.

But the higher ratios become more difficult to wind, so it's often better to achieve a high ratio by using two transformers in series. For instance, if you want an impedance ratio of 16:1, use two 4:1 transformers. But remember, the two transformers cannot be the same because the input impedance required for the second transformer is quite different from the input impedance of the first as it must match the output impedance of the first transformer. For instance, if you wanted to connect to a high impedance off-centre-fed antenna with 50 Ω coax cable, you could use a pair of 4:1 ununs, the first going from 50 Ω to 200 Ω and the second from 200 Ω to 800 Ω.

Construction materials and methods

Earlier in this article, mention was made of the core heating/saturation problems which arise when a 60 Hz transformer is operated at 50 Hz, or a 220 V transformer is operated at 240 V. Of course, with any real transformer there are losses. It would be nice to use air-cored baluns because then magnetic saturation could never occur, but the physical size would be burdensome and the likelihood of approaching $\lambda/2$ wire length in the windings increases. So we use magnetic cores – mostly ferrites.

Ferrites have a frequency-dependent permeability, μ, which is high at the LF end, relatively flat in the middle range and then falls off at the HF end. At the LF end we need to be concerned about magnetising losses and at the HF end, the inter-turn capacitive losses. At the HF end there will be sufficient inductive reactance in the winding that we can ignore magnetising losses and the risk of reduced permeability. Even when the initial permeability falls as frequency rises, the ferrite core can be used as a former for an 'air-cored' inductor/transformer primary

Auto-transformer vs transmission line transformer

Auto-transformer

The inter-winding capacitance results in reduced bandwidth. And the best efficiency mid-band is often less than 95%.

Transmission line transformer

This is a broadband device – you can more than cover the amateur radio HF bands with one TL transformer. And the efficiency is greater than 99% for most of the pass-band.

Here is a typical set of curves comparing the auto-transformer and the TL transformer:

Figure 13 shows that the TL transformer has a broader pass-band and higher efficiency than the auto-transformer. The curve 'with no core' demonstrates the small effect due to reduced core permeability at the HF end, and the massive loss at the LF end.

For these reasons, I will stick with transmission line transformers from here on.

What characteristic impedance (Z_0) is needed inside the balun/unun?

We have discussed input and output impedance. What we are concerned with now is the impedance of the transmission line (TL) inside the balun/unun. Here, we use the normal TL transformer equation. This internal TL impedance should be the geometric mean between Z_{TX} and Z_{ACU} (when feeding a balanced ACU directly at the transceiver) or between Z_{TL} and Z_{AE} (when feeding such antennas as the OCF dipole, $5\lambda/8$ vertical or Yagi-Uda).

Some examples

- If Z_{TX} and Z_{ACU} both = 50 Ω, Z_0 = 50 Ω. Easy – we can use 50 Ω coax.
- If we are trying to feed an OCF dipole or $5\lambda/8$ antenna, assume Z_{TL} = 50 Ω and Z_{AE} = 200 Ω; so $Z_0 = \sqrt{(50 \times 200)} = 100$ Ω. Here we could use two parallel lengths of 50 Ω coax with only their shields bonded (ARRL Antenna Handbook, 1991:24.21) or see below.
- If we want to feed a 3-element Yagi-Uda antenna, where Z_{TL} = 72 Ω and Z_{AE} = 18 Ω, then Z_0 = 36 Ω. We could use strip-line for this.

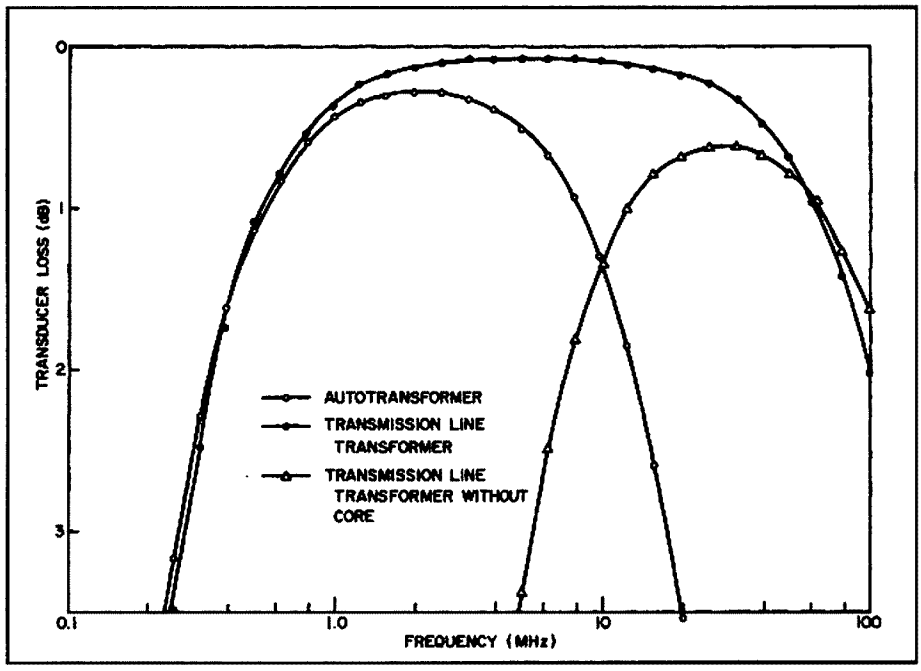


Fig.13. Transformer performance.

TTS Systems Communications Equipment

TTS Systems www.ttssystems.com.au **FREE CATALOGUE**

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

SG-237 Smartuner™

Built to last, the SG-237 is designed with high density surface mount components on a 4 layer PCB, providing high efficiency, reliability and performance. The PCB is mounted on a sturdy chassis plate giving an excellent electrical and RF ground system. The unit is fully waterproof (under 2 ft of water for 24 hours). The case is weather resistant, high grade ABS plastic that is sealed at the factory.

MULTIPLE APPLICATIONS -- Use for base, mobile, portable, marine or aviation.

The SG-237 is our most popular Smartuner. Its rugged construction and small size allow maximum flexibility. Its 100W power rating and additional frequency coverage to 60MHz, matches it perfectly with the most popular HF transceivers. It will work with any balanced or unbalanced antenna including whips, backstays, dipoles, loops and longwires, and requires a minimum of only 28 feet of antenna for full coverage operation.

TECHNICAL SPECIFICATIONS

HF Frequency Range:	1.8 to 60 MHz
Power Input Range:	3 to 100W (PEP) and 40W (continuous)
Input Impedance Range:	45 to 55 ohms
VSWR:	Typical: Less than 2:1
DC Input Requirement:	+13.8 VDC (nominal)
DC Operating Range:	+10.5 to 18 VDC
Input Current:	300 milli Amps
Average Tune Time:	Typical: Less than 2 seconds
Recurrent set time:	Typical: Less than 10 milliseconds
Memory Capacity:	170 non-volatile locations
Possible Tuning Combos:	1/2 million
Antenna Length:	7 feet (3.5 to 60 MHz) / 28 feet (1.8 to 60 MHz)
Installation:	Any position, ideal at antenna feed point
Operating Temperature:	-35 to +70 degrees C
Size:	9L x 7W x 1.85H inches
Weight:	2 pounds (approx 1 kilo)
Case Construction:	Waterproof ABS plastic cover on an aluminium base
Control Cable:	Shielded 4 conductor RG-58 coax with PL-259 connector
Control Cable Length:	9 feet std, custom to- order
Accessories:	Smartlock™

For those souls who wish to do their own thing we can supply the SG237 as an unpackaged board level component with of course a significant cost saving.

BUDDIPOLE

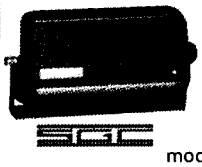
It's a dipole... It's a vertical... It fits in your travel bag! More than an antenna; it's a versatile system for launching your signal. Optimised for transmit power and proven for DX work, the Buddipole™ is used by HF portable operators all around the world.

Precision engineered for maximum performance from ultra light composite materials and High-Q coils. Zero-loss balun with Quick-Connect feedpoint.

The standard Buddipole antenna comes with—

- Two 22" black anodised aluminium arms
- Two multi-band coils (40m - 10m) with adjustable coil tap system (inc. 3 removable taps, with coils premarked for 40, 30, 20, 17, 15, 12, and 10 metres -- 6 and 2 metres are configured without coils)
- Two stainless steel telescopic whips, the VersaTee™ with 3/8" x 24 adaptors
- BNC/PL259 coax connector assembly (includes RF beads) with 25' of RG58 coax
- Nylon "packcloth" carry bag with velcro strap,
- Black thermoplastic carry case; ops manual.

ADSP SPEAKER



Works with the press of a button. Three modes: no noise reduction, the original ADSP, and the new ADSP2 noise reduction mode which provides up to 26 dB of noise reduction within the passband. ADSP2 Speaker is "One Touch" - simple to operate.

We have

SGC

SGC 237 Waterproof Auto Tuners

SGC 239 Economy Auto Tuners

Autek Antenna Analysers

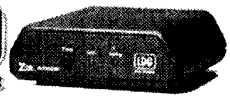
Autek RF 2kW in-line Power meters

Lutron

Lutron Measuring Instruments

Vantage Pro Weather Stations

LDG ELECTRONICS

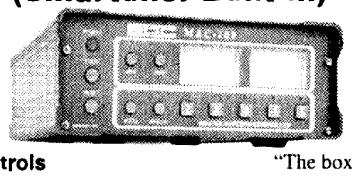


Z100 TUNER AND Z1000 HIGH POWER AUTO TUNER

MAC-200

MASTER ANTENNA CONTROLLER

(Smartuner Built-In)



Controls

5 ANTENNAS

3 S0239 COAXIAL CONNECTORS

1 BALANCED ANTENNA OUTPUT

1 END FED LONG WIRE

"The box that brought my amateur radio hobby back to life"

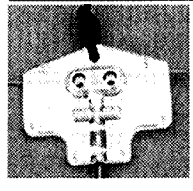
TenTec KITS

TEN-TEC

Model 516 Argonaut V IF-DSP QRP Transceiver

The benefits and features of IF-DSP, in a modern 20 watt HF transceiver. 20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjustable from 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP). Metering measures forward or reflected power in switchable 2 or 20 watt scales

Order your 450 ohm Ladder Line NOW



Ten-Tec 3003 Acro-Bat antenna hanger.

Made from UV resistant polycarbonate plastic, Hammers won't break it. Hardware is S/S Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna. or ladder line with internal pegs.

How to roll-your-own balun/unun

Case 1 – Where a Z_0 of 100 Ω is required

The formula for the Z_0 of 2 parallel wires is

$Z_0 = 276 (\log (2s / d)) / \sqrt{\varepsilon}$

where

ε = dielectric coefficient of spacing material

s = distance between centres

d = diameter of wires

If we assume air spacing (ε = 1) and substitute our required 100 Ω into the formula, we get

$100 = 276 \log (2s / d)$

This gives s / d = 1.15; so, we can use almost any two wires, perhaps with a thin sleeve over one of them to achieve the 15% spacing, plied flat together.

Case 2 – Where a Z_0 of 36 Ω is required

The formula for the impedance of two flat strips is

$Z_0 = 138 (\log (4s / w)) / \sqrt{\varepsilon}$

where

s = spacing

w = width

ε = dielectric coefficient of spacing material

or, if w >> s

$Z_0 = 377s / w\sqrt{\varepsilon}$

If we assume that ε of the separator = 1.44 (eg, one of the plastics), and substitute our required 36 Ω into the formula, we get

$36 = 377 \times s / w\sqrt{1.44}$

from which s / w = 0.115.

So, get two strips of very thin copper, of width 4.42mm (approx 3/16") and roll them with two layers of 0.25mm (0.010") Mylar® or Teflon® tape. You may even be able to get some of the powder-coated strip that MM Metals has been experimenting with, to achieve the same effect, without the difficulty of holding the two copper strips and the two layers of insulating tape together.

Note: The thickness of the copper strips does not enter into our impedance calculations. The cross-sectional area of the strips determines the current limit at LF, but at HF and beyond, the thickness of the strip becomes the limit as the effective area diminishes with frequency. So, we need thicker strip just to meet plain dc thermal requirements. (see Terman, 1955:22)

How many turns?

Now we have yet another impedance to consider – the magnetising impedance of the primary winding.

If there are not enough turns, there will be insufficient primary inductance and at the LF end the core will overheat, resulting in a permanent loss of permeability. If there are too many turns and the current level is maintained:

- we are likely to saturate the core (B = μNI) giving rise to distortion, spurious signals and heating,
- we will get reduced transformer action at the HF end because of capacitive coupling between the turns, and
- we may approach a winding length of λ/2 at some frequency.

Formula for inductance

For this discussion, I have assumed you want to transmit at least 100 W. To

keep the balun size reasonable, I have assumed we will use a ferrite core. The inductance we need to calculate is the magnetising inductance, L_M. For a toroidal core, this is

$L_M = 0.4\pi N_P^2 \mu_0 (A_E / l_E) \times 10^{-8}$ Henry (Sevick, 1990:2.2)

where

N_P = number of primary turns – always a whole number

μ_0 = initial permeability of the core at the lowest frequency of interest

A_E = cross-sectional area of the core

l_E = magnetic path length in the core

Many texts and core providers reduce this formula to

$L_M = kA_L N_P^2$ Henry

where

k = a constant

A_L = the inductance index for a particular core

(See *ARRL Handbook* (1991:6.25); Langford-Smith, F (1960:445); Terman (1955:ch2) and the Amidon information sheet)

The formulae for rod ferrites are much more complex because of the high-reluctance air section in the magnetic path

The number of turns is a compromise between upper and lower 0.45 dB points. Why 0.45 dB? This represents about 10 % losses, which is just about acceptable. It can be shown that (see Appendix 2 for a derivation of this.):

$X_M = 3 \times Z_{AE} / 2$.

If we substitute this in the formula for the number of turns, we get the approximation:

$N_P = \sqrt{(2 \times Z_{AE} \times l_E \times 10^7 / f \mu_0 A_E)}$

Now, we want high permeability μ_0, a large core area A_E, and small core length l_E to give us a small-diameter, squat toroid.

If operating at 10 MHz, assume $\mu_0 = 100$ and $Z_{AE} = 50\ \Omega$, and we get:

$N_P = \sqrt{(l_E / A_E)}$.

An example

For $Z_{AE} = 300\ \Omega$, and operating at 1.8 MHz, we need to multiply the above approximation by

$\sqrt{(300 / 50 \times 10 / 1.8)} = 5.77$

just to compensate for the change of impedance and frequency.

If we choose the model FT-240 toroid with $A_E = 1.57$ cm², and outer diameter = 6.096 cm, then $l_E = 14.40$ cm.

Thus $l_E / A_E = 9.17$ and hence $\sqrt{(l_E / A_E)} = 3.03$.

So, $N_P = 5.77 \times 3.03 = 17.47$ turns, say 18. (we can't use partial turns with a toroid).

Another example

Building on what we learned in the previous example, let's say we want to use a bit more power; so we choose a ferrite with the same dimensions but with an initial permeability $\mu_0 = 300$ to reduce the losses.

If this were to operate at 1.8 MHz and now feed a 50 Ω dipole, then: $N_P = 3.03$ [toroid dimensions] $\times \sqrt{(300 / 50)}$ [impedance change] $\times (100 / 300)$ [permeability change]

$= 3.03 \times \sqrt{2}$

= 4.29 turns (use 5 turns)

Choice of ferrite mix

You will recall that inductance L is proportional to N^2 and μ. As you can see from Figure 14 below, μ is flat up to a knee and then falls off with frequency. Because inductive reactance X_L is proportional to L and frequency (ie, to f, N^2 and μ) then as the frequency increases and μ falls, the (f x μ) product remains essentially constant. Thus the reactance X_L of the magnetising inductance becomes proportional to N^2.

Generally, it is recommended that you avoid iron powder mixes because they have lower permeability and therefore require more turns, and have a smaller operating frequency range.

Don't be put off by people who say you must choose a ferrite that has the frequency range – ask to see the curve of μ vs frequency. You can use a ferrite characterised for 10 to 20 MHz (eg, type 61) to well beyond 100 MHz.

Have a careful look at your RF PA design to see if there is any chance of dc getting into the transformer primary. If dc flows in these windings, the permeability will fall and heating will occur. If lightning hits your balun/unun, you can be fairly certain that the safe operating temperature will have been exceeded and you will need to replace the core.

Use the largest cross-section ferrite you can afford in order to keep the power loss per unit volume low; then the temperature rise is unlikely to reduce the permeability. This is always countered by the need to keep the length of windings well below $\lambda/2$. If

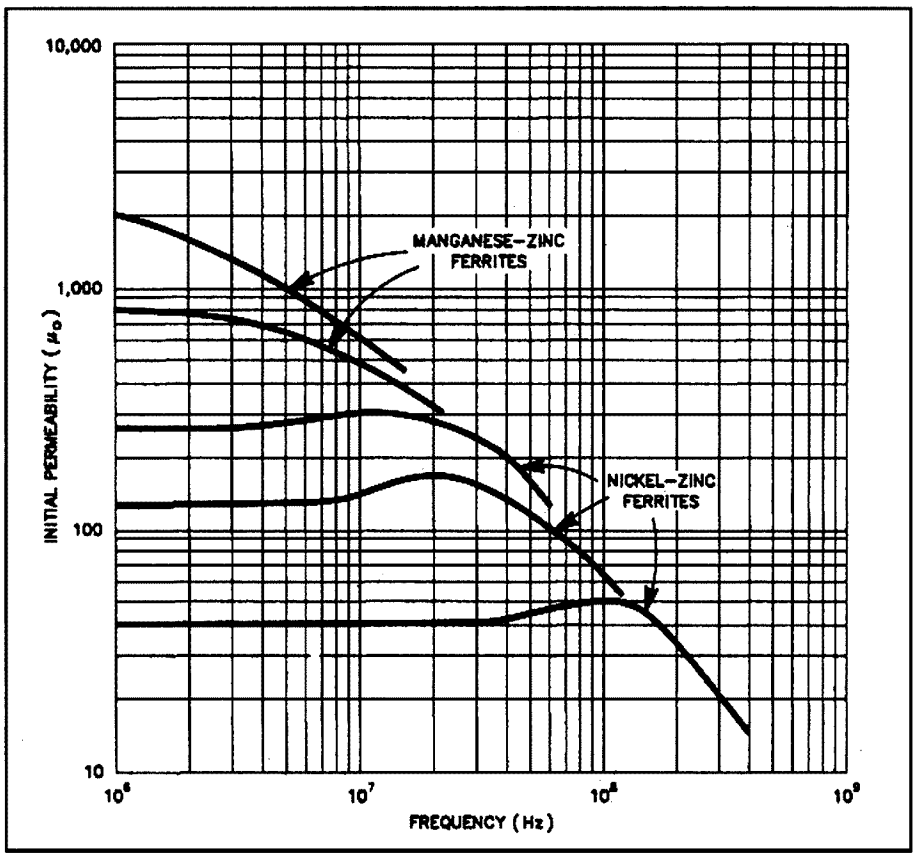


Fig 14, Initial permeability vs frequency for common ferrite cores (Fig 3-13, Transmission Line Transformers [1990] by Jerry Sevick, ARRL, p3-14).

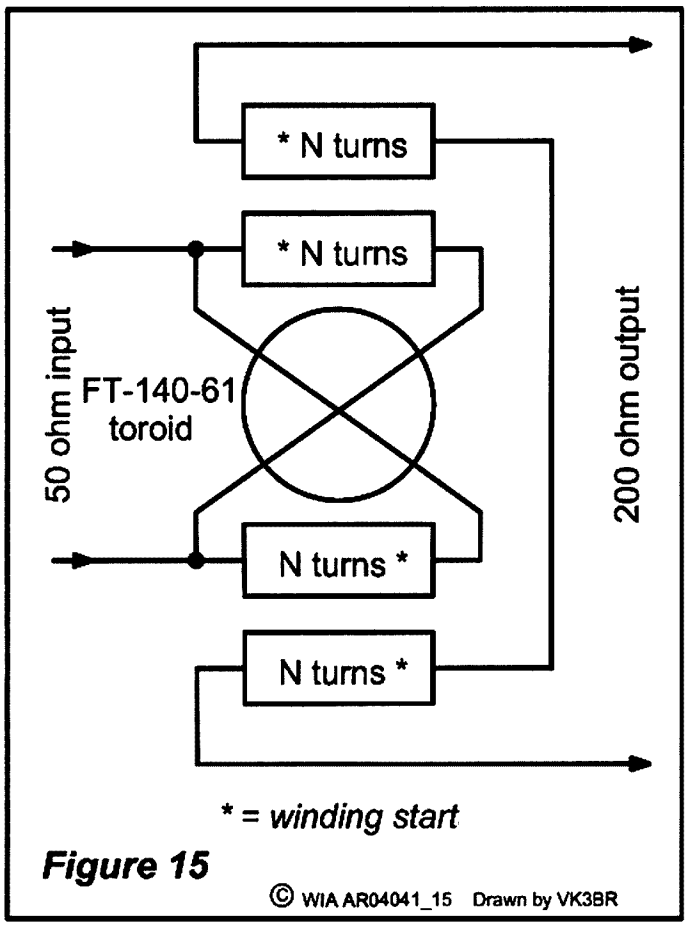


Fig 15. A 4:1 transmission line balun, unun or balbai.

the temperature exceeds 100°C on a regular basis, choose a larger core and wire size or you will exceed the Curie point and damage the core permanently. The higher the initial permeability, the fewer turns required for low frequency performance, the less the inter-turn capacitance and hence, the better the high frequency performance, and the lower the ohmic losses. However, it is wise to choose a ferrite whose initial μ is less than 300 – much more than that and efficiency falls, leading to more heating.

As your operating frequency rises, the current flows more and more on the surface of the wire. Heating thus increases, so the safe power input falls. You can overcome this by using larger gauge wire or tubing.

Some practical advice:

- If you break a ferrite toroid, use an isocyanacrylate glue (eg, Super Glue®) to cement all the broken parts together. Ensure that all air gaps have been excluded, so that you don't increase the reluctance of the magnetic circuit. Be careful – isocyanacrylates degrade with temperature.
- Ferrites are ceramics and so are very good insulators – there is no need to insulate cores before you wind any conductors onto them.

Practical 4:1 baluns

Case 1 – 50 Ω to 200 Ω

Suppose we want to feed an OCF antenna with RG-58 coaxial feed line. The antenna Z_{AE} = say 200 Ω and Z_{TL} of the RG-58 is 50 Ω. A TL design of balun requires a Z_0 of 100 Ω. A bifilar wound coil using 1.0 mm enamelled copper wire, wound on a FT-140-61 ferrite core, can achieve this. You will need about 3m of wire, folded in half.

1. Tie the two wires together, flat, with small cable ties or even Sellotape®. Avoid twisting.
2. Feed in 7 or 8 turns to get the LF performance, spaced evenly around one half of the toroidal core to reduce inter-turn capacitance.
3. Tie the winding in place with cable ties.
4. Now wind in and secure another 7 to 8 turns, exactly as before, spacing them on the other half of the core. What you have now is two 100 Ω TLs giving two 1:1 transformers.
5. Connect one winding of each pair in parallel to provide the 50 Ω primary.
6. Connect the other two windings in series to provide the 200 Ω secondary.

See Figure 15 for connection details. The start end of each winding is indicated by x.

You should pay no more than $13 - $15 for a FT-140-61 toroidal core. Try TTS Systems for cores and specification sheets – there is an advertisement in every issue of AR magazine.

Case 2 – 75 Ω to 18.75 Ω

This is the kind of balun you require to feed a three-element Yagi-Uda antenna from RG-59 coaxial cable. Here, the required characteristic impedance of the TL transformer is 37.5 Ω. If you look back a bit in this section you will find that strip-line can be suitable for this impedance. If you go through all the calculations, you will discover that the strip needs to be about 4.5 mm wide. Then follow the rest of the instructions for constructing your strip-line transmission line balun.

A Yagi-Uda antenna for 40 m is out of the question for most of us. How about a 20 m beam? So, our lowest operating frequency is 14 MHz. How many turns do we require on a core (such as FT-140-61) whose permeability is 125?

Recall, we arrived at the formula $N_P = \sqrt{(l_E / A)}$ when operating at 10 MHz, and when $\mu = 100$ and $Z_{AE} = 50$ Ω.

If we use the FT-140-61 core, we discover that $l_E / A = 11.19$. Correcting for different permeability, impedance and frequency, we get:

$N_P = \sqrt{((l_E / A)(100 / 125)(75 / 50)(10 / 14))}$.

Note: We have used the 75 Ω impedance for calculating magnetising inductance because the primary, which supplies the magnetising current, is 75 Ω.

So, $N_P = \sqrt{((11.19)(0.8 \times 1.5 \times 0.70))} = 3.10$; we would use 4 turns.

We could use the same wiring layout as for the previous balun and so follow the same construction steps, this time with 4 turns of our strip-line on each half of the toroid. The parallel connections go to the 18.75 Ω antenna and the series connections to the 75 Ω coaxial cable.

Because of the effort required to make a strip-line transmission line, you might allow for the possibility of a 40 m beam. Think big! So, if you choose to wind 5 turns instead of 4, the lower 0.45 dB point will be about 5.4 MHz and such a design would easily perform from 7 MHz to 70 MHz.

For complete balun kits, try http://www.ozgear.com.au/balun/ToroidalBalunKits.htm

What if there is a mismatch?

Recall from the earlier material that antenna impedance changes with frequency.

So, if the characteristic impedence of the balun is greater than optimum for your operating frequency, remember that:

- The resistive part of Z_{IN} increases slightly with frequency and Z_{OUT}
- The reactive part of Z_{IN} is positive and increases with frequency and Z_{OUT}

And, if the characteristic impedance is less than optimum for your frequency:

- The resistive part of Z_{IN} decreases greatly with frequency and Z_{OUT}
- The reactive part of Z_{IN} is negative and increases with frequency and Z_{OUT}

Summary on baluns

Here are the main considerations when designing and constructing baluns/ ununs:

1. Frequency range – with a ferrite core, the whole of the amateur HF spectrum (possibly to 6 m) can be covered by one balun
2. Impedances – operate at constant impedances, in and out, whenever possible; though going too high is better than too low
3. Matching – the output impedance should match the downstream device to meet the Jacobi criterion
4. Turns ratio and impedance ratio – there are problems with power bandwidth when high impedance ratios are attempted
5. Transmission line impedance for matching input to output – the geometric mean formula
6. Magnetising flux – the number of turns required to get the appropriate flux
7. Construction materials and methods
8. Power handling capability.

References and bibliography

- *ARRL Antenna handbook* (1991) – though any edition should do
- *ARRL Handbook* – any edition should do
- Butler, Lloyd *The EH antenna*, Amateur Radio, 72, 5, pp18 to 21
- *Iron-powder and ferrite coil forms* Amidon Associates, Costa Mesa, Ca (2001)
- Johnson, Richard C. (Ed) *Antenna Engineering Handbook*, (3rd edition 1993), McGraw Hill, NY, NY
- Kraus, John D. *Antennas*, McGraw Hill, NY, NY (1988)
- Langford-Smith, Fritz *Radio Designers Handbook*, Illiffe, London (1955)
- *Radio Communication Handbook*, RSGB, Potters Bar, Herts, UK (1982) ch 11 Propagation
- Sevick, Jerry *Transmission Line Transformers*, ARRL, New Haven, CT (1990)
- Shrader, Robert L. *Electronic Communication*, McGraw Hill, NY, NY (5th edition 1985), ch 20
- Terman, Frederick E. *Electronic and Radio Engineering*, McGraw Hill, NY, NY (1955)

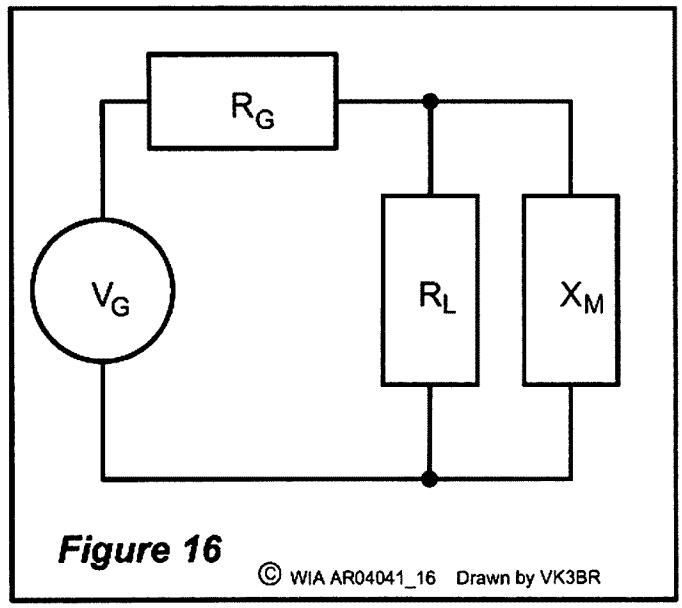


Fig 16.LF model of antenna connected to the magnetising inductance of the balun/unun primary.

Appendix 2

Balun design – calculation of minimum LF inductance

(borrowing from Sevick, 1990:2-3)

This derivation of the relationship between the magnetising reactance X_M and the source impedance R_G, for a nominated operating bandwidth, relates to the earlier discussion on balun design under the heading, "Formula for inductance".

All power amplifiers have an internal resistance, R_G, which we try to match to our antenna impedance Z_{AE}, in order to meet the Jacobi requirements for maximum power transfer from generator to load. Figure 16 represents the LF model of the antenna connected to the magnetising inductance of the balun/ unun primary.

When the Jacobi condition is met,

$R_G = R_L$ and so, $V_{RL} = V_G / 2$.

The maximum power available to the load is therefore:

$P_A = (V_G / 2)^2 / R_G$

The equation for LF efficiency can be written as

$\eta_{LF} = P_{LOAD} / P_A = 4X_M^2 / (R_G^2 + 4X_M^2)$

where $X_M = 2\pi fL_M$ (recall, L_M is the magnetising inductance of the primary of our balun).

While it is usual to measure the frequency response in audio circuits at the –3 dB points, that represents a 50 % loss in a power device. For the balun, our design target is a 10 % loss, corresponding to 0.45 dB. This means an efficiency η_{LF} of 0.9 or 90 %, and to obtain this result from the above formula:

$4 \times X_M^2 = 0.9(R_G^2 + 4X_M^2)$

Solving this, we get

$2 \times X_M = 3 \times R_G$

ar

Silent Key

Maurice Talkes VK3VTW,

member of the Geelong Amateur Radio Club, passed away May 30th after a short illness.

submitted by H.J. Virgo VK3DVY.

A miniature variable DC supply

Jim Tregellas VK5JST

I found myself in the workshop recently, looking at a pile of unwanted AT and ATX computer power supplies and wondering what to do with them. They seemed too good to throw out but were definitely in the way of progress. "Great free boxes for projects" I thought, "but what can you put in them? How about a variable supply? And yes, I can mount one of those big lumpy expensive heatsinks where the fan goes. But, wait a minute, how about using the fan (which comes free) for cooling?" And so was born an idea.

Probably the most useful general purpose supply one can have has specs like 0-20V DC at around 1 amp maximum. This allows experiments to be conducted using both digital chips, linear ICs such as op amps and timers, and standard transistors, etc.

If you are a typical experimenter like I am, the supply must feature protection against voltage spikes coming from things like DC motors, relays and other inductive loads which you will one day connect to the output terminals, together with the ability to operate into a short circuit for an unlimited time without damage. It must also exhibit perfect stability when subjected to a rapidly fluctuating load. Furthermore, large spikes on the supply mains should not stop it working either. So there was a target spec - a bulletproof supply delivering 0-20 V at 1 amp with very good load regulation. And if a variable current limit could be included to cover things like battery charging, and the switch-on of a test circuit with faults (without destroying all the semiconductors) so much the better. This last feature is only very rarely provided, and then only on top grade laboratory supplies.

One of the major problems associated with the design of any variable supply is getting rid of the heat which is generated when either a short circuit or a low voltage high current load is connected to the output terminals. For this supply, at least 27 watts has to be dumped under short circuit conditions (an input to the regulator circuit of at least 27 volts is necessary if the 20 volt maximum output is to be free of ripple).

Now this doesn't sound like much until you do a bit of homework. If any reasonable size heatsink is picked from either the Jaycar or DSE catalogues, e.g. type HH8566 of Jaycar, it will have a thermal resistance of at least 2 deg. C/W. At an ambient temperature of say 30 deg. C, this gives a heat sink operating temperature at full load of 84 deg. C, which is much too hot. You can burn your hand on this and it will ultimately cook the electronics inside the box too.

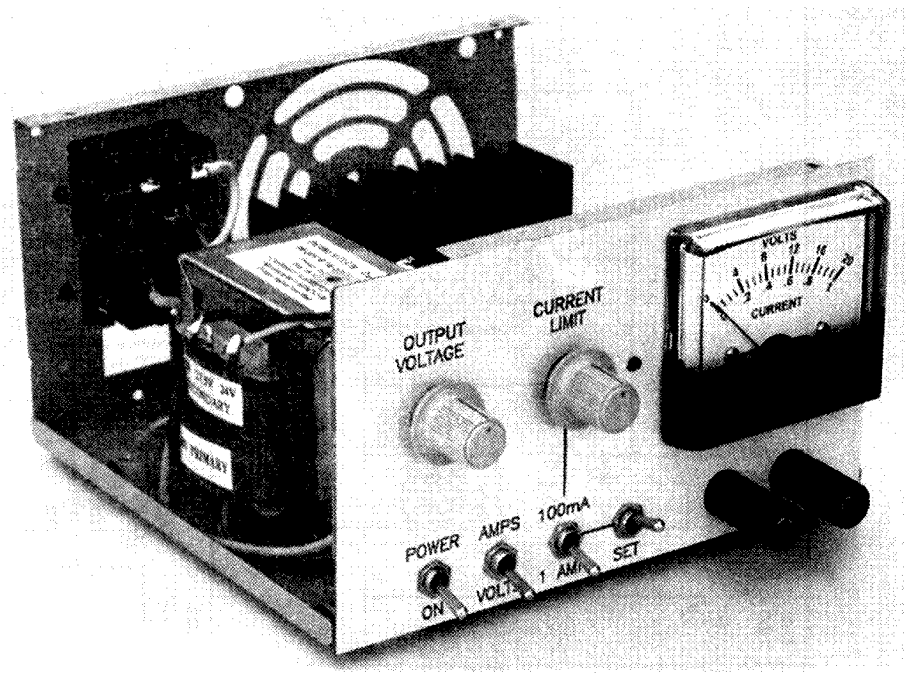


Photo 1. Front panel view.

The problem is that this is continuous power which must be dissipated (these sinks are okay for audio amplifiers which have peaky outputs and low average power dissipations). What is highly desirable is a sink with a thermal resistance of maybe 1 deg. C /W or less. Try finding one of these in a reasonable size!

Now this is where the fan comes in. Even with a moderate draught, the thermal resistance of a heatsink drops dramatically and some tests with a standard computer fan and a Jaycar HH8518 heatsink (normally 7 deg. C/W) show that 0.5 deg. C/W is easily achieved. So in a 40 deg. C environment the sink reaches 53 deg. C which allows safe continuous operation into a short circuit. And this sink is small and only costs $2.70!

The fan should be arranged so that cool air is first blown past the electronics and transformer and then finally over the heatsink and out of the box.

If you have a power supply case with large ventilation slots on both side panels of the lid, the fan can be mounted externally at the rear of the case saving you from having to cut a large hole in the lid top.

If the fan grille at the case rear is not flat, (preventing external mounting of the fan) cut the grille out leaving a large circular hole. This type of case simplifies the metal work considerably and only leaves you with holes to cut

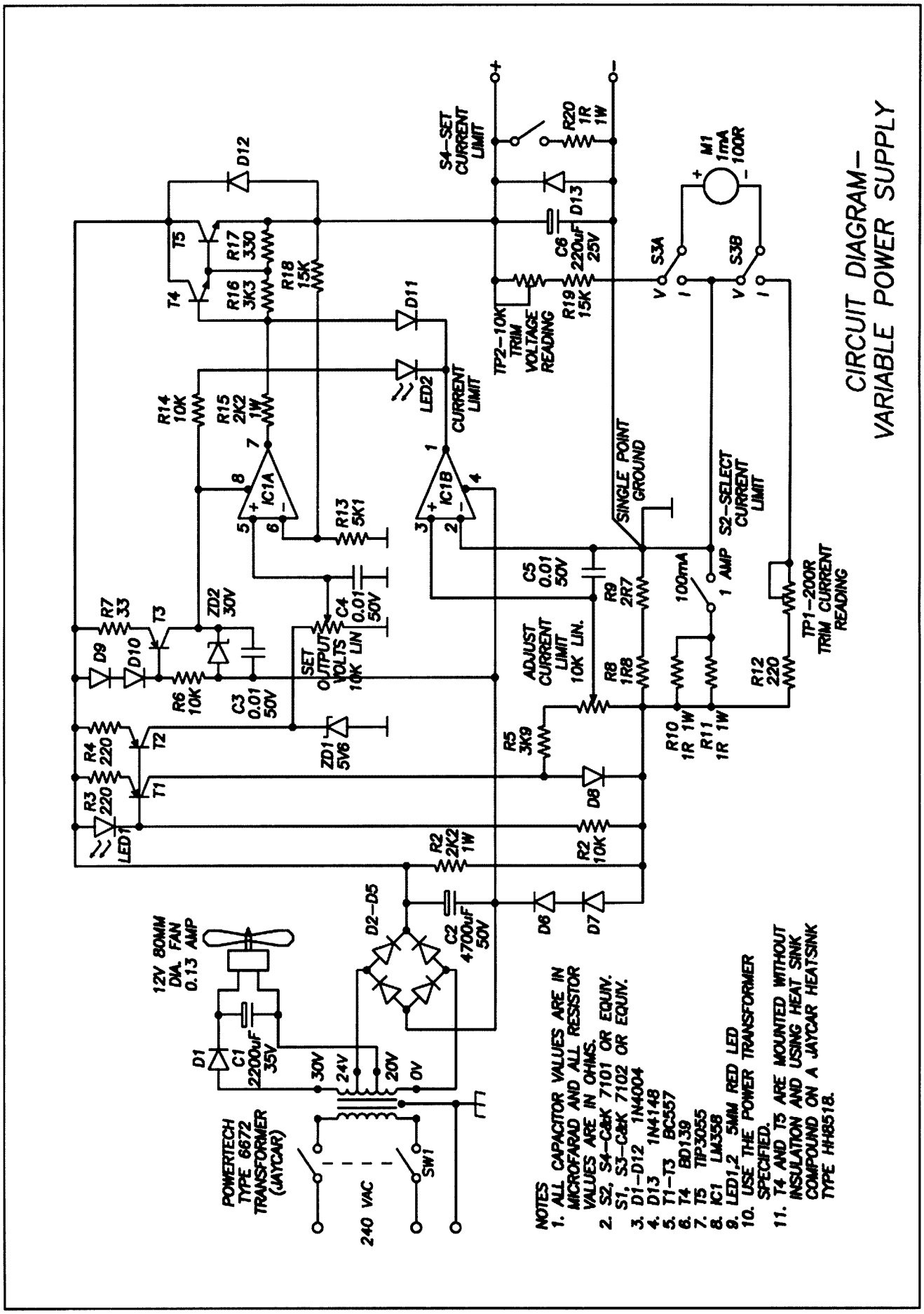
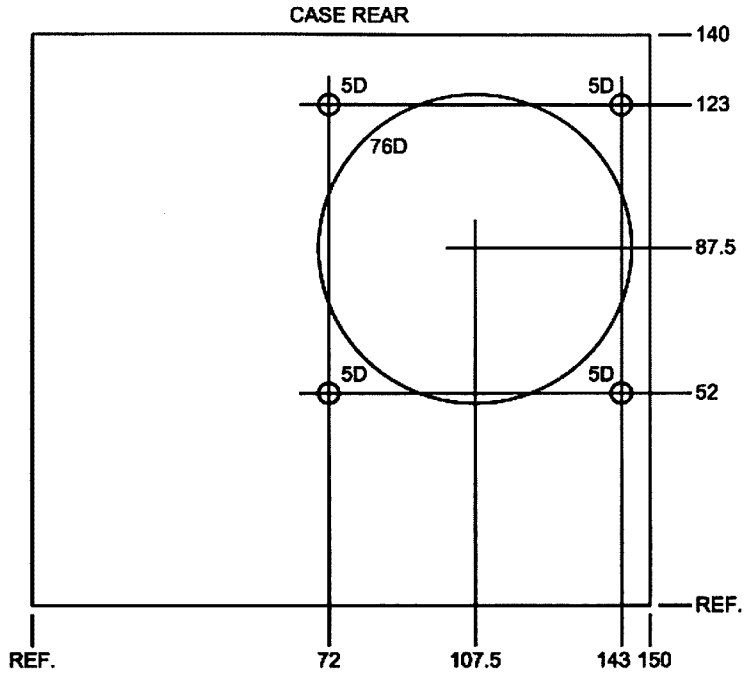
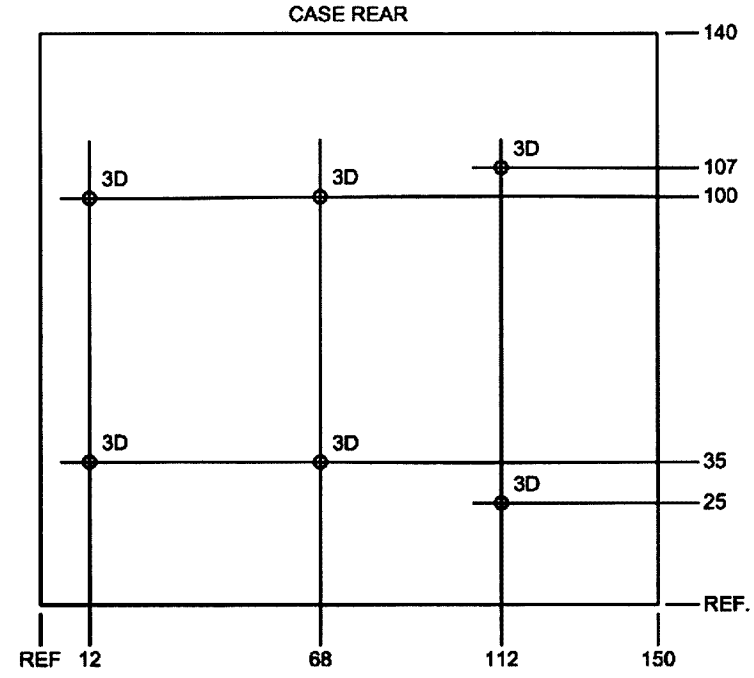


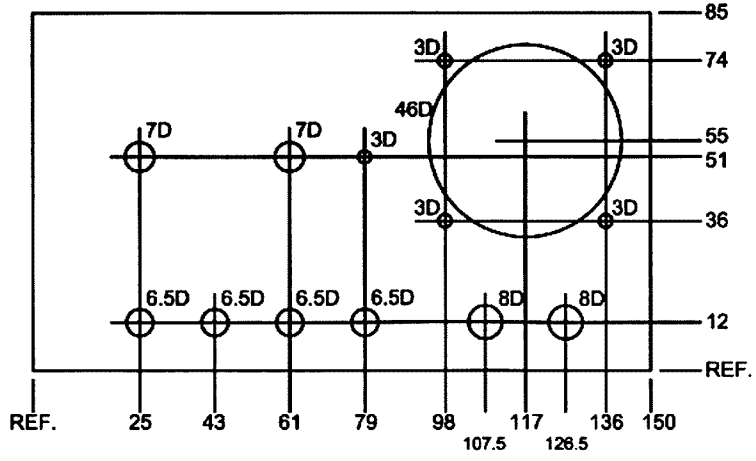
Fig 1. Circuit diagram



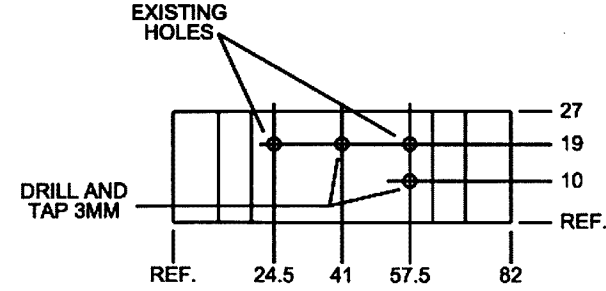
CASE LID DRILLING DETAILS
(OUTSIDE VIEW)



CASE BOTTOM DRILLING DETAILS
(OUTSIDE VIEW)



FRONT PANEL DRILLING DETAILS



HEATSINK DRILLING DETAILS

JAYCAR PART NO. HH-8518
BOTTOM VIEW

Fig 2. Mechanical drawings for the front panel, case and heatsink.

in the steel front of the case and matching laminex (or similar material) front panel. Details of this, and the holes to be drilled in the case bottom are given in the drawings.

How it works

The supply output voltage is controlled by comparing a sample of the supply output (from voltage divider R18 and R13) with a clean reference voltage provided from ZD1 via the wiper of the SET OUTPUT VOLTS pot.

An error amplifier IC1A shifts the output voltage until the voltages at its two inputs (pins 5 & 6) exactly match.

If the pot wiper is set to the top of its travel and pin 5 = 5.6 volts, then the output voltage must rise to just over 20 volts for this matching to occur.

Likewise if the pot wiper is set to minimum and pin 5 = 0 volts, then the output must also move to 0 volts.

The super clean reference voltage of 5.6 volts is derived by a process of double zenering.

A red led (LED1) applies around 1.8 V across R7 and the base emitter junction of T2. Therefore about 1.15 V appears across R7 (220 ohm) setting the collector current of this transistor to around 5 ma. This collector current is quite free of ripple due to the diode action of the LED, and any remaining ripple is further reduced by passing this constant current of 5ma through the 5.6 volt zener.

The result is a laboratory grade voltage reference of 5.6 V with a remaining ripple of around 200 micro volts.

An identical technique is used (T1, R3, D8 and R5) to develop a ripple free reference voltage of 0.45 volts across the ADJUST CURRENT LIMIT potentiometer. Depending on the position of S2, the output current passes through either 4.5 ohms (R8, R9) or 0.45 ohms (R10, R11, R8, R9) producing a voltage of up to 450 millivolts across these current sensing resistors and providing output current ranges of either 0 – 100 mA or 0 – 1 amp.

This voltage is applied to M1 via R12 and a trimpot to indicate supply output current, and is also compared with the voltage present at the wiper of the

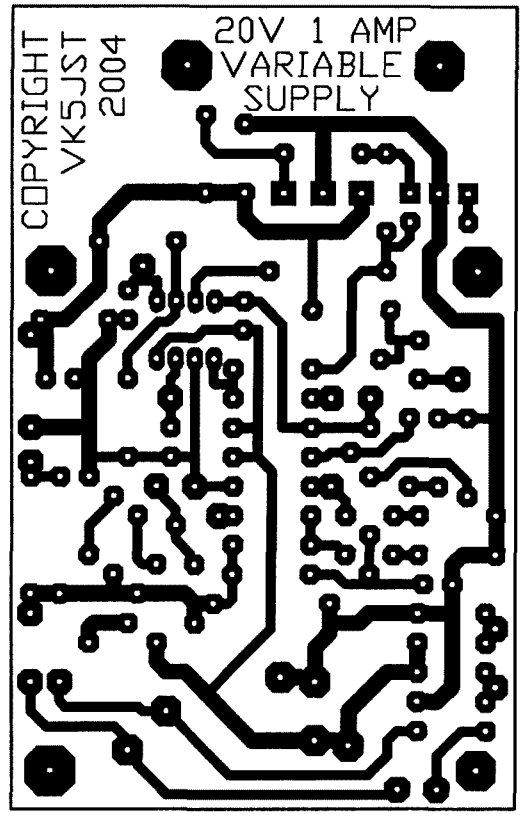


Fig 3. The PCB artwork.

ADJUST CURRENT LIMIT pot. If more current is demanded by the load than has been set by the user, the error amp output (IC1B pin 1) moves negatively turning on the current limit led (LED2) and stealing base drive current from the Darlington output transistors, T4 and T5, until the current limit set by the user has been achieved. Note that R15 allows IC1B to always sink more current than IC1A can source.

The last part of the circuit requiring clarification is T3 and its associated components. The voltage regulation of small transformers such as the 6672 is never good (typically 20%) and under conditions of no load the dc rail voltage

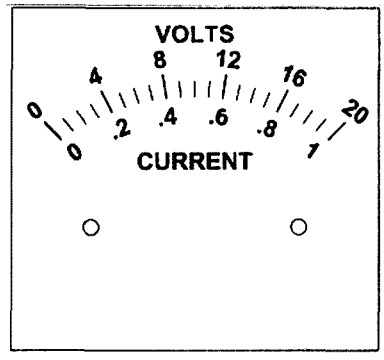


Fig 4 – Meter scale artwork.

rises to around 35 V. This is in excess of that allowed for the LM 358. Under conditions of full load the rail drops to around 28 V. T3 is yet another constant current source which, with a 35 V rail supplies around 18 mA to a combination of the op amps and the zener diode. This limits the maximum supply to the op amps to 30 volts and also protects the op amps from spikes on the main AC supply. When the supply rail drops below 30.6 volts the zener switches off and T3 goes into saturation, supplying only the current demanded by the op amps and providing a supply voltage to the op amps of only 0.6 volts less than the supply rail. Spike protection of the supply is also enhanced by D12 & D13 which bypass spikes from either the load or ac mains around the regulator circuitry. Last, the components D6 & D7 together with bleed resistor R2 provide a negative rail for the op amps which is 1.6 volts below the negative supply terminal. This allows the op amps to pull the output voltage right down to zero.

Construction

The first item to be made is the laminex front panel.

After carefully marking out and drilling this item, use it as a template to produce the holes in the metal work so that the two items exactly match. Depending on exactly where the ventilation slots in the case metal work occur, it may pay you to slightly adjust the position of some of the front panel holes.

Drill the holes in the case bottom, and if appropriate, add the holes in the case lid for the fan (see earlier comments). Lettering can be added to the front panel using Letraset or similar, and protected with a light overspray of low gloss polyurethane lacquer.

Next, drill and tap the two additional holes required in the heatsink and mount T4 and T5 on the underside of the sink. No mica or silicone rubber washers are necessary but use thermal grease to ensure good thermal contact.

Fabricate the printed circuit board and mount all components. The heatsink is attached to the PCB using long 3 mm

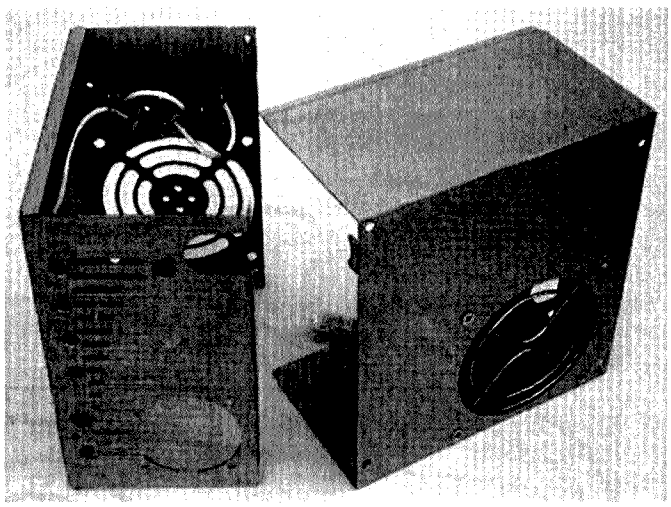


Photo 2 – Modified metal work of the case.

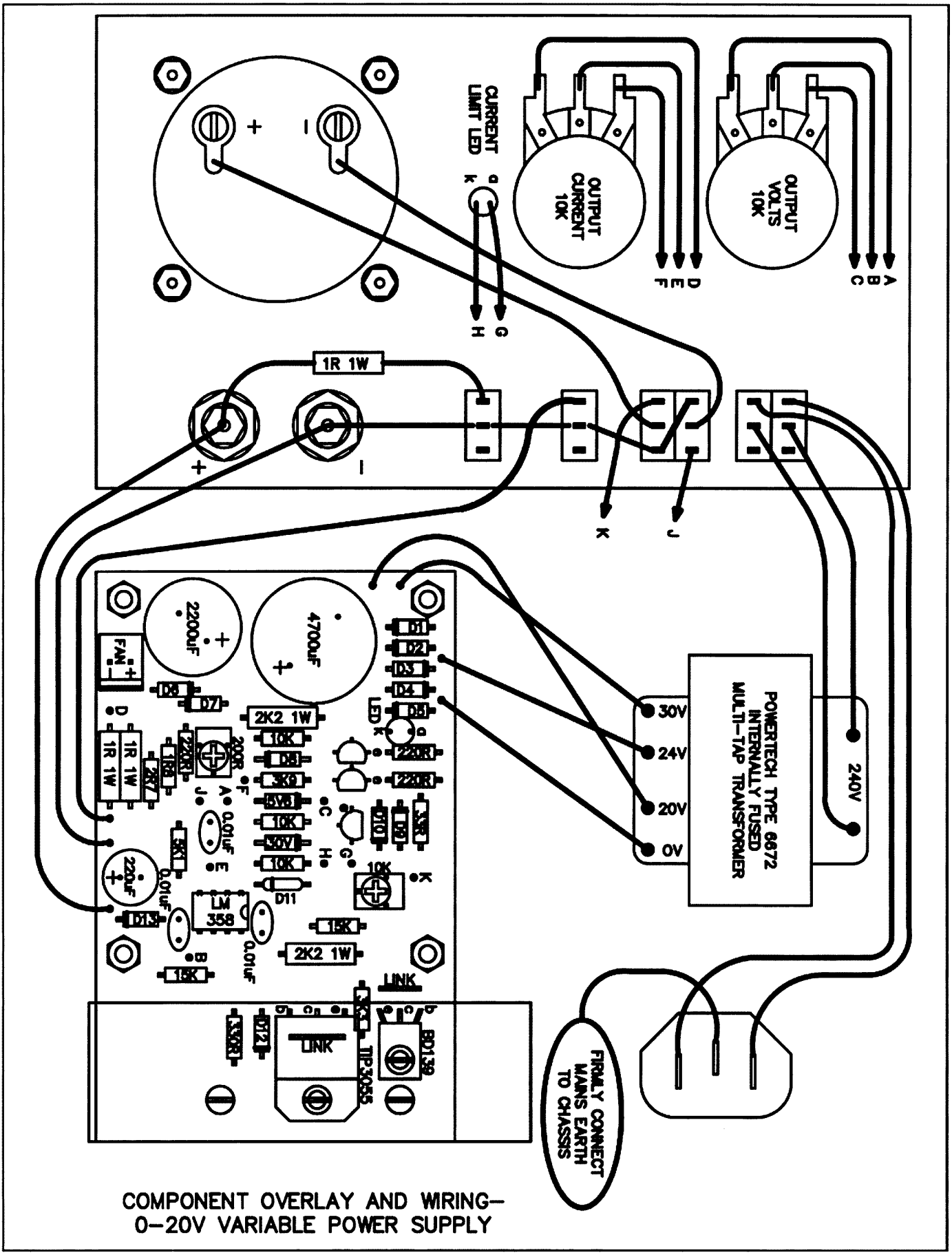


Fig 5. The PCB component overlay, etc.

screws and 12 mm long 3 mm bore spacers. The leads from T4 and T5 are bent as close as possible and at right angles to the transistor bodies.

Provide long multi-coloured flying leads for all connections from the PCB to the front panel and transformer. Remove the fan connector from the old power supply PCB and use it on the new one.

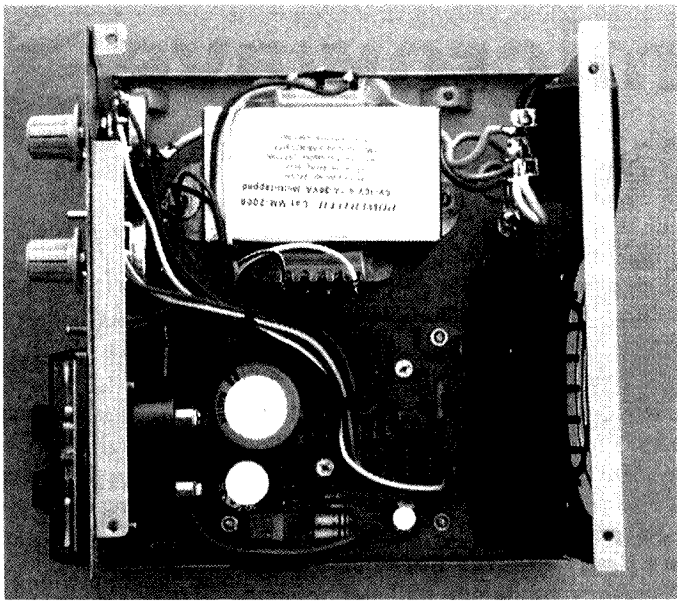


Photo 3 – Plan view of the assembled power supply.

Mount all hardware except the transformer, and complete all wiring except for the leads to the transformer. Screw the transformer into the case and add the wiring to it.

Ensure that physical contact with 240 volt ac mains is not possible by covering any exposed part of this wiring with heat-shrink tubing. Plug in the fan but do not screw down the lid yet. You are now ready to test.

Testing

Set all potentiometers and trimpots to half travel and check that S3 is set to monitor output voltage.

Set the current limit switch (S2) to 100 mA and ensure that the supply output is not shunted by S4.

Briefly apply the mains and check that the voltmeter reads up scale and can be varied using the SET OUTPUT VOLTS pot.

Next, close S4 and set S3 to monitor output current. Briefly apply the mains and confirm that the output current can be varied using the ADJUST CURRENT LIMIT pot. Open S4.

Place a DVM on, say, its 1 amp dc range across the output terminals to monitor supply short circuit current.

Reconnect the mains to the power supply and adjust TP1 so that the current meter reads correctly.

Confirm that the current meter reads correctly with the power supply set to deliver up to 1 amp.

Select the 200 volt dc range on the DVM, set S3 to measure output voltage and adjust TP2 so that the supply voltmeter reads correctly. This completes testing.

Specifications

All measurements taken with an output of 20 Vdc

Load regulation:- less than 1 mV output change for output currents from 0 – 0.95 amps

Line regulation:- less than 1 mV output change for AC mains inputs from 220-260 Vac

Hum and noise:- less than 1 m VRMS at an output current of 0.95 amps

Note that it is not possible to set an output voltage if the supply current limit is set to zero!

ar

Correction

We have to correct the calculation on page 15 right hand column of the May issue of AR .

1.3 dB as a power ratio is calculated as follows:

antilogarithm of 1.3/10 = a'log 0.13 = 1.3489629, approx

To calculate the loss, take the inverse and subtract from 1.0

The inverse = 0.7413102 pu

The loss = 1.0 - 0.7413102 pu = 0.2586897 pu, or approx 26%.

Not 36 % as quoted in the article.

VHF and microwave propagation characteristics of ducts

Part 2

Andrew L Martin, VK3KAQ

Observation and theory

Ducts occur in meteorological conditions where the temperature increases with increasing height over a distance of a few 10s of metres, instead of decreasing with increasing height as is normal in a well mixed atmosphere. Regions where the temperature increases with height are called temperature inversions. An example of an elevated temperature inversion is shown in Figure 8 where at around 580 m the temperature increases over a short distance from about 18 deg C to about 24 deg C at 680 m. Above and below this point the temperature is seen to decrease with height in the normal way.

Such temperature inversions trap water vapour below them to form a duct as shown in Figure 8 where at around 580 m the water content decreases from about 8 gm/kg below the temperature inversion to 3 gm/kg above the inversion. A corresponding dramatic decrease in humidity that is associated with the temperature inversion is also evident in Figure 8.

From amateur observations the two most outstanding effects of ducts are firstly that the upper and lower frequency limits are well defined and have something to do with duct strength and secondly, locating antennas closer to a duct is better for achieving long distance contacts. These effects will be used to validate the equations that describe duct behaviour. Several other observed effects are noted later.

The most common way to calculate a duct profile is to obtain the modified refractive index M [16] from:

$$M = \frac{77.6}{T}\left(P + \frac{4807\,xe}{T}\right) + 0.157xh \quad (1)$$

where:

T is temperature in degrees Kelvin
P in the pressure in hectopascals
h is the altitude in metres

and e is the vapour pressure given from:

$$e = 6.1078x10^{(7.5xTd/(237.3-Td))} \quad (2)$$

where T_d is dew point temperature.

A series of duct M profiles is shown in Figure 9 where the characteristics of the different types of ducts are evident. The approximate dimensions for each type of duct are also given.

The data to calculate the M profiles can easily be obtained [15]. Using equations (1) and (2) an M profile for the data of Figure 8 is calculated and shown in Figure 8. This M profile indicates the presence of an elevated duct at 600 m (see Figures 8 and 9). The elevated duct position in Figure 8 corresponds to the increase in temperature and a decrease in humidity and further corresponds to the increase in signal amplitude from the SODAR measurements of Figure 4 taken at the same time. A change in wind direction is also associated with the duct, the wind shear also being seen in the SODAR data of Figure 7. The water vapour content decreases above the duct indicating that water vapour is trapped by the temperature inversion.

The elevated duct has a depth of 350 m, a width of 35 M units and a duct gradient *dM/dh* of *0.71M/m*, Figure 1. Typical values for duct gradients are between 0.1 (weak gradient) and 2 (strong gradient). The size of the duct (depth and width) determines the minimum frequency, equation (3) while the strength of the duct (gradient and depth) determines the entry and exit angles for the duct, equation (4).

Having set out the basic properties of a duct, the propagation characteristics can now be investigated. An estimate of the longest wavelength that can be propagated by a duct using the duct dimensions can be estimated from [17]:

$$\lambda_{min} = 0.6 \times A \times D \times \sqrt{\Delta M} \quad (3)$$

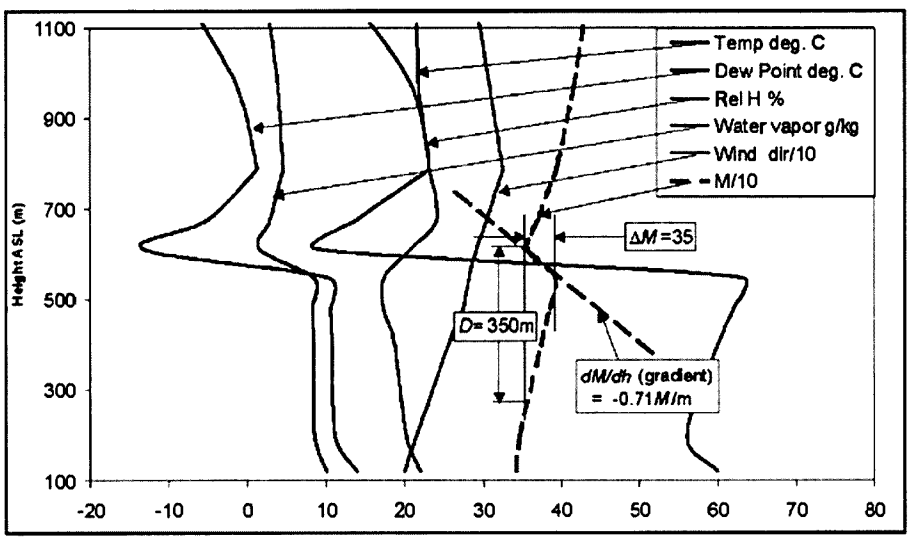


Figure 9. M profiles for various types of ducts. The depth of each D duct is shown for each type of duct. The M profile for a standard atmosphere (a), an evaporative duct has depths of up to 40 m (b), surface ducts have depths up to 300 m (c and d) and elevated ducts have depths up to 300 m at heights between 400 m and 1400 m(e). Elevated ducts also occur above 1400 m but are of limited interest to amateur operators.

where:

A is 3.77×10^{-3} for a surface duct and 5.66×10^{-3} for an elevated duct

D is the depth of the duct in metres

ΔM is the maximum difference in the modified refractive index within the duct.

The maximum wavelength that can be transported for a range of measured ducts is shown in Figure 10 [17]. This concept of a maximum wavelength (minimum frequency) that a duct will support is consistent with all of the amateur observations. For the data from Figure 8, and using Figure 10, the minimum frequency that could be transported by this duct is about 60 MHz (5 m) as it is quite a large duct. As the depth of the duct becomes shallower, shorter maximum wavelengths are supported as shown in Figure 10.

The amateur observations show there is also a maximum frequency that a duct can support. This is further confirmed by the work of Baker and quoted by Howse [5]. This is an issue because the current theory does not indicate that a duct has a maximum frequency as well as a minimum frequency.

It may be that in fact the entry into and exit from the duct is frequency dependent and provides an explanation for the observed effects. A formula from [18] gives the critical angle Φ_t at which a signal can be trapped by a duct:

$$\Phi_t = 7.39 \times 10^{-2} \times \sqrt{(|dM/dh|)xD} \quad \text{deg.} \quad (4)$$

where:

$|dM/dh|$ is the magnitude of gradient of modified refractive index.

The duct parameters of Figure 8 give a trapping angle of 1.16 degrees. Equation (4) assumes that the refractive index gradient is linear over the whole duct and that the surface of the duct is smooth. As (4) is not frequency dependent, it indicates that all frequencies above f_{min} would be trapped by the duct. It is most likely that (4) is very conservative and that the duct structure is more complex resulting in a gradual low and high frequency cut off rather than one well defined low frequency boundary suggested by (4). The observations show that trapping by a duct has a lower and upper frequency limit. There is thus a need to arrive at a better understanding of the mechanisms involved.

By modifying equation (4) to include a frequency dependent ratio, the author developed a formula that better describes the trapping by a duct as a function of frequency and duct parameters. This formula (5) is now more consistent with the observations. The concept of this modification of (4) is that the duct trapping angle is reduced by the ratio of the duct minimum frequency to the operating frequency. This formula can be used to estimate the maximum trapping angle Φ_{tf} for any given frequency to enter into a duct. For duct trapping angles greater than Φ_{tf} the given frequency will not be trapped by the duct and will pass through. This addition of a frequency dependent ratio to (4) now provides the observed frequency dependence so that:

$$\Phi_{tf} = \Phi_t \times f_{min}/f \quad \text{deg.} \quad (5)$$

where:

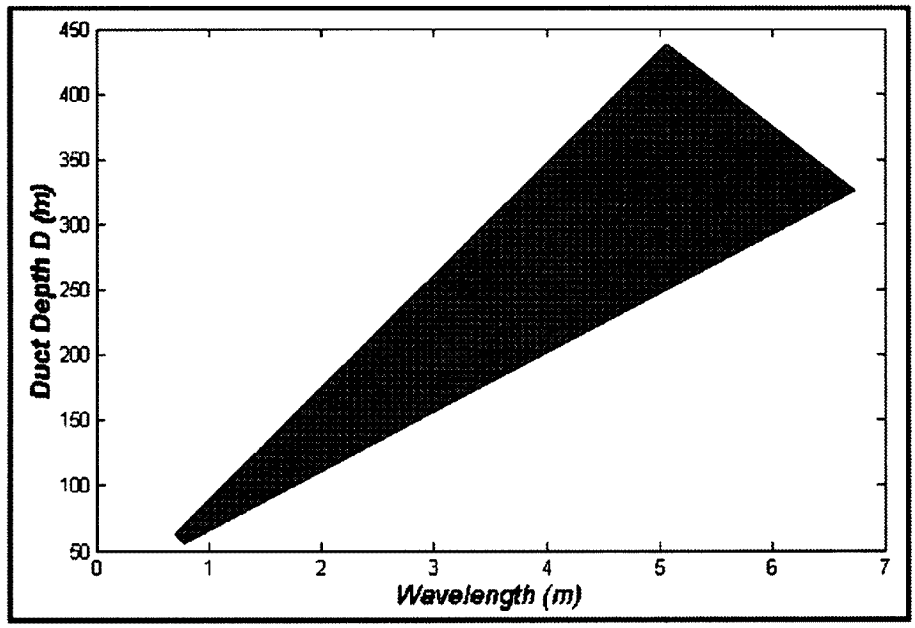


Figure 10. The range of maximum wavelengths that could be transported by a duct of particular depths calculated from measured data.

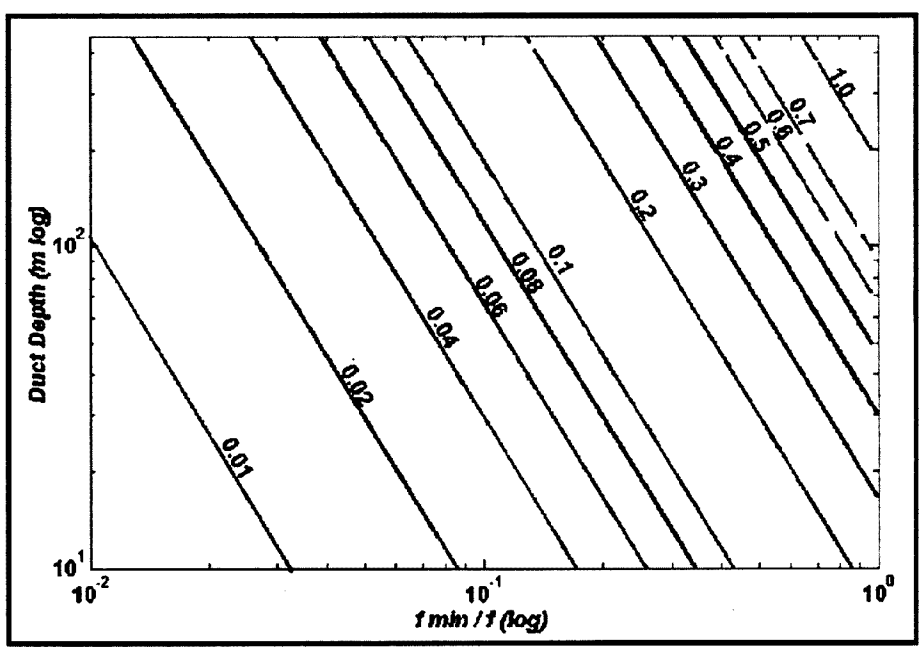


Figure 11. Duct entry angle (degrees) for a range of duct depths and f_{min}/f with dM/dh = 1.0. For other values of dM/dh multiply the above angles by sqrt(dM/dh). The data assumes that the duct is smooth. For a rough duct with 4 km long gravity waves [14] and a height variation of +/-2 m the minimum sustainable duct entry angle is about 0.1 degrees. The duct roughness has the effect of providing an upper frequency limit for a given duct strength.

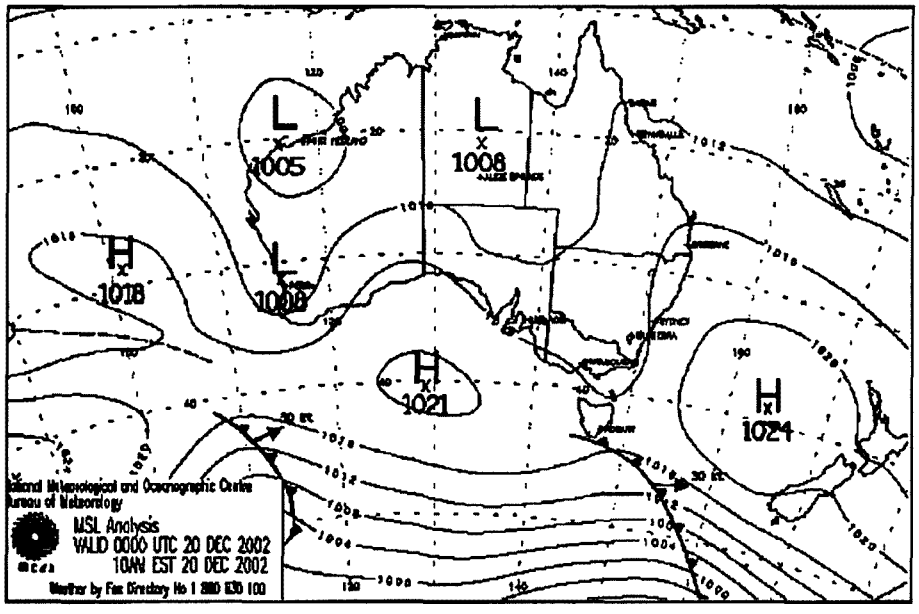


Figure 12. MSL analysis for a period of good VHF propagation from Esperance to Melbourne on 20 December 2002.

f is the frequency for which the angle of trapping to the duct is required and $f > f_{min}$ so that $\Phi_{tf} < \Phi_t$.

The duct entry angles given by Equation (5) over a range of duct depths and f_{min}/f and for $dM/dh = 1.0$ are shown in Figure 11.

To illustrate the effect of the combination of minimum wavelength and actual frequency consider that a strong duct with a 150 m depth has an approximate maximum wavelength from Figure 10 of 2 m (144 MHz). The corresponding duct trapping angle at 144 MHz from Figure 11 is around 0.8 degrees for a duct dM/dh of 1.0. For an operating frequency of 1.2 GHz (9 times or f_{min}/f of 0.11) the duct trapping angle is now about 0.1 degrees. This indicates that a station operating at 1.2 GHz has to be considerably closer to the duct than a station operating at 144 MHz in order to minimise the duct trapping loss. For a larger duct of 320 m depth and with the same dM/dh of 1.0, the maximum trapping wavelength is about 5 m or 60 MHz with a duct maximum entry angle of over 1 degree. The 1296 MHz station with f_{min}/f of 0.046 has a duct trapping angle of 0.06 degrees and needs to be close to or in the duct otherwise the duct trapping loss will be too high and preventing communication at 1296 MHz.

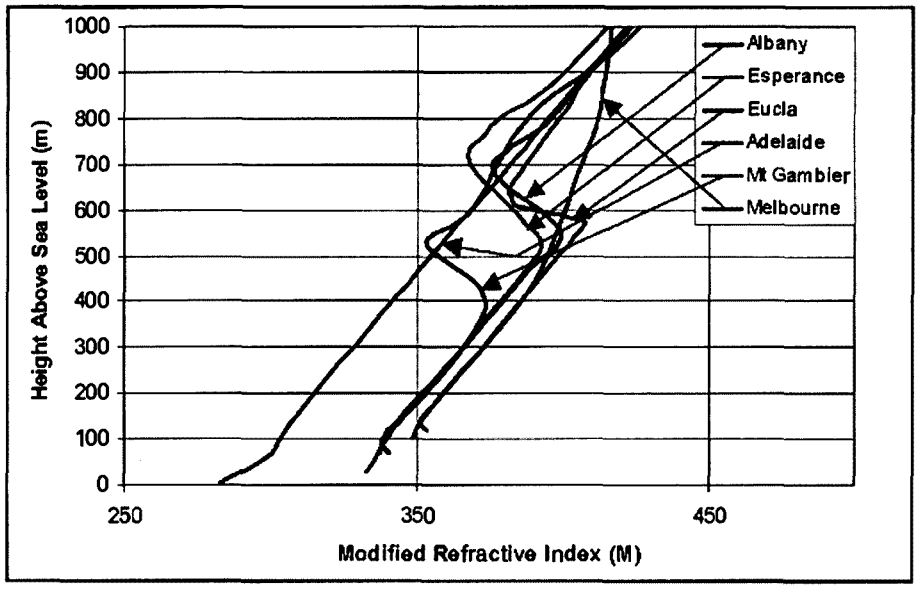


Figure 13. M profiles for the indicated stations for 00.00 UTC, 20 December 2002. This indicates the position of the elevated layer around the time of the good propagation conditions.

Entry to a duct at the lowest frequency that the duct can sustain is relatively easy as at this frequency the usable entry angle is largest. This seems to indicate that propagation at the lowest frequencies sustainable by the duct should produce long distance contacts. The reason why this is not possible is that the duct characteristics vary over the region where the duct is present so that the duct may support 60 MHz propagation only in the regions where the duct is weaker. In regions where the duct is stronger, only higher frequencies are supported so that long distance propagation at frequencies around 60 MHz is precluded.

As previously discussed, the surface of the duct has a wave-like structure. This surface roughness is probably due to internal gravity waves and wind shear induced instabilities in the stable boundary layer [14] that is associated with the inversion and distorts the duct surface by giving it a wave shape that is visible in the original photo used for Figure 1. This surface wave now causes the duct to have a continuously changing angle with respect to the horizontal so that a signal propagating along the duct is now required to adapt to this surface wave angle. If the angle of trapping to the duct at a particular frequency is smaller than the surface wave angle then the signal will not be trapped by the duct. The author developed the concept of surface wave angle Φ_{SR} which is approximated by:

$$\Phi_{SR} = a\sin(4 \times A_s/\lambda_s) \text{ degrees} \quad (6)$$

where:

A_S is the amplitude of the surface wave and

λ_S is the surface wave wavelength.

For a duct with a λ_S of 4 km and an A_S of 2 m the surface wave angle is about 0.1 degrees. For the previous example of a 1296 MHz signal with a trapping angle of 0.06 degrees, a shear roughness angle of 0.1 degrees would indicate that the 1296 MHz signal would not be able to be trapped by the duct. At 10 GHz it is even more critical to be in the duct or very close to it if duct propagation is to be contemplated because of the effects of the duct surface waves.

It is thus evident that higher frequencies will have higher duct trapping loss than

lower frequencies accounting in part for the observed frequency dependence assuming that the duct is smooth and follows a nice curve. If the surface of the duct is rough due to the effects of surface waves then the trapping angle will be larger for any given frequency. This effect will further reduce the upper frequency limit that the duct can transport. Smoother ducts transport higher frequencies than rougher ducts.

The equations above, plus the assumption that ducts have rough surfaces due to surface waves, gives a reasonable explanation of the observed frequency dependence for ducts with different strengths and also provides an explanation of the various duct entry and exit effects noted.

20 December 2002 analysis

On 20 December 2002 good propagation conditions were reported between Esperance and Melbourne [19]. The MSL analysis map for this day shows a large high-pressure system with a central pressure of 1021 positioned in the Great Australian Bight, Figure 12. This is a classic "good VHF propagation" situation [5].

To find out a little more about the nature of the duct that was present on 20 December the radiosonde soundings from Albany, Esperance, Eucla, Adelaide, Mt Gambier and Melbourne are analysed to provide M profiles for each of the stations and are shown in Figure 13.

The M profiles show an elevated duct at Albany, Esperance, Eucla and Mt Gambier. The top of the elevated duct is at a height of between 600 m and 700 m on the Western end of the path and at 500 m at Mt Gambier. There is evidence of a duct at Melbourne as the M profile is bent above 500 m. The time of the profile at 11.00 am local time in Melbourne means that there was probably sufficient surface heating to break up the duct structure on this day. The SODAR data from Figure 4 provides clear evidence for a duct being present earlier in the day on 20 December 2002 at 600 m. It is interesting to note that the top of the elevated duct in this high-pressure system is entirely between 500 m and 700 m providing further evidence that the height of the duct is similar over the whole high-pressure system. There is no evidence of the elevated duct drooping down to become a surface duct, see Figures 4, 5 and 13.

The profiles from the Western end of the path are taken at 00.00Z (08.00 local time) when the duct has not yet been disturbed by local heating. The profile from Adelaide shows no evidence of an elevated duct as the duct may have been disturbed by local surface heating. The temperature was 30 deg C in Adelaide at the time of the observation. The path taken by the VHF signals from Esperance to Melbourne passes south of Adelaide so that if a duct is not present at Adelaide it does not have any effect on this path.

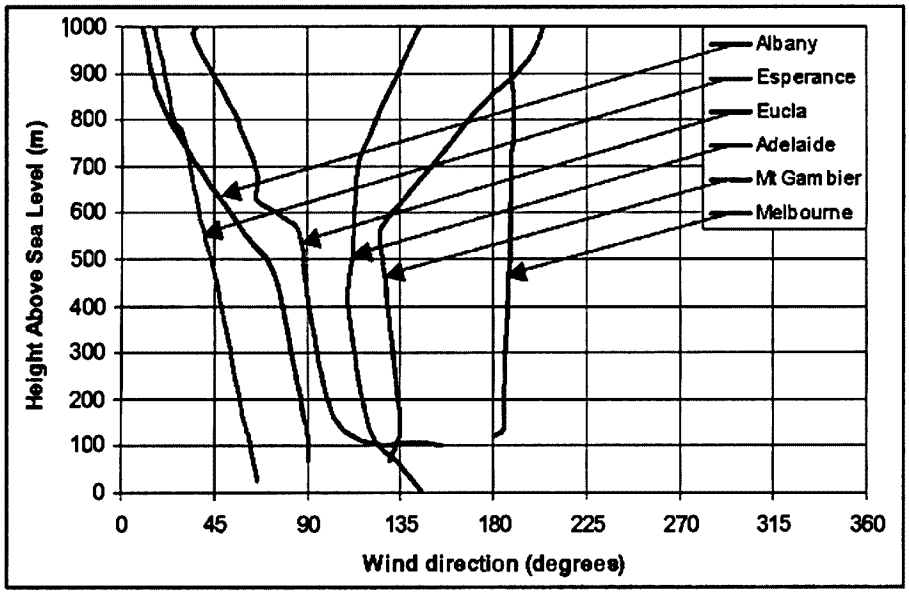


Figure 14. Wind direction for the indicated stations for 00.00 UTC, 20 December 2002.

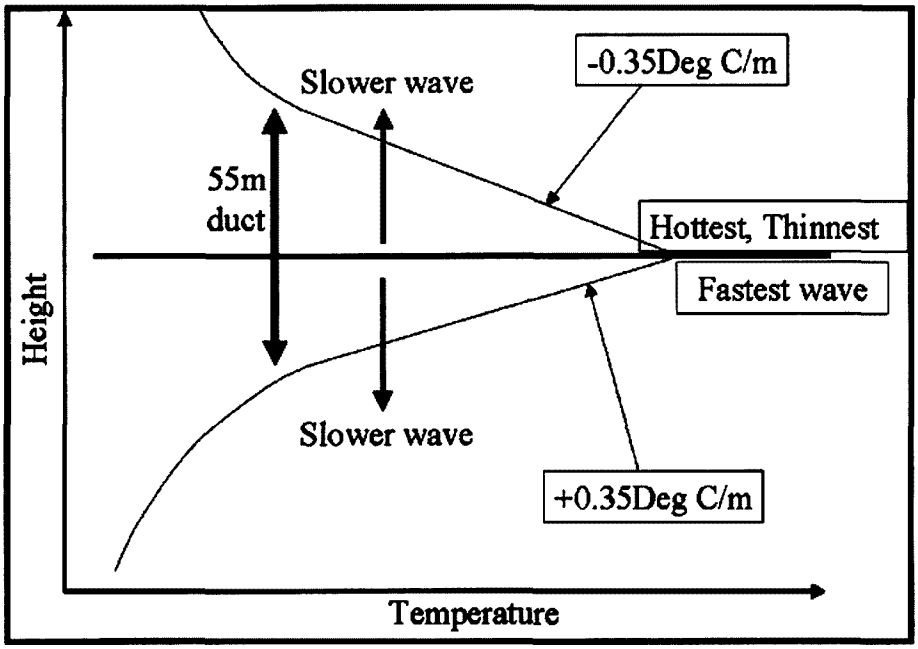


Figure 15. In the duct the upper and lower boundaries have a temperature gradient of 0.35 degrees C/m. At the hottest part of the duct the air is driest and thinnest and radio waves travel faster than in the cooler parts of the duct where the radio waves travel slower.

The wind direction for the same time of the *M* profiles is shown in Figure 14. The wind is approximately east on the western part of the path going more southerly further towards the eastern end of the path. Above about 500 m the wind goes more northerly at the western end of the path and more southerly at the eastern end of the path resulting in the wind shear associated with the elevated duct. These wind directions are entirely consistent with wind in a high-pressure system where the surface wind flow is anti-clockwise around the high-pressure system. It is this wind direction and the presence of elevated ducts that indicates that the high-pressure system causes the elevated ducts and that most likely no other meteorological effect is involved in the formation of elevated ducts. This discounts the requirement of sea breeze effects to form a duct over this path [5].

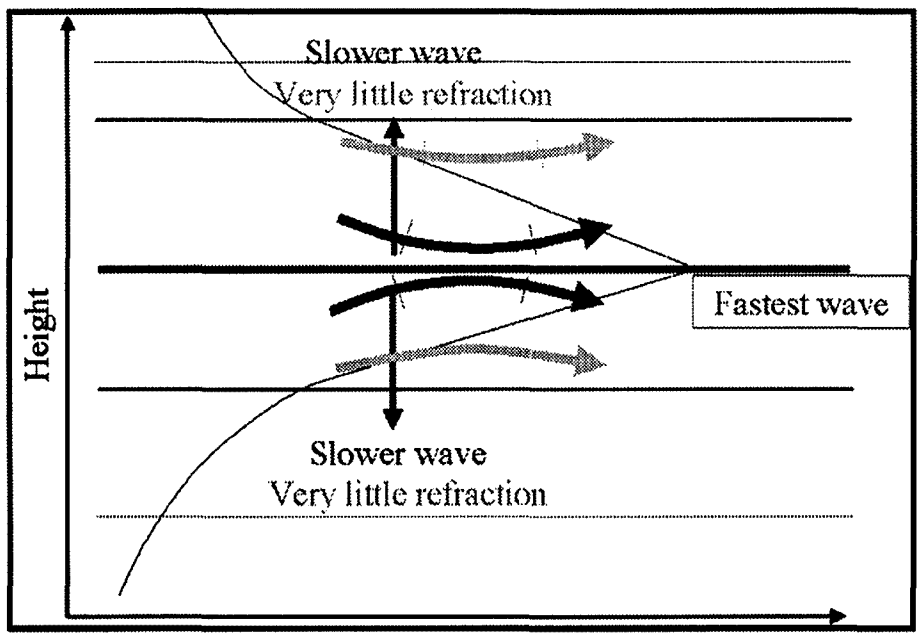


Figure 16. At the centre of the duct the wave front is bent more than further out in the duct resulting in a bending of the wave front.

Putting it all together

In order to understand how the observed effects and the theory come together the structure of the duct needs to be examined in some detail. The elevated ducts are of the most interest for long distance propagation and are discussed here.

The elevated duct structure is very complex. It has substantial temperature changes and associated changes in wind speed and direction (wind shear) Figures 4, 5, 6 and 7. This wind shear shown in Figure 7 is caused by the subsidence in high-pressure systems when the falling drier air encounters the cooler, denser more humid air below and results in a "balance point" and resulting wind shear. At this "balance point" the compression of the falling air causes an increase in temperature as the falling air is compressed against the more dense air below. The changes in temperature and humidity plots are readily evident in Figures 4, 5, 6, 7 and 8 at around 600 m. When the temperature increases with a corresponding decrease in humidity a duct is formed.

The mechanism by which radio waves are refracted in a duct is that the wave front travels faster in the less dense air found at the centre of the duct and slower in the cooler, more dense air further from the centre of the duct. The radio signal is thus refracted away from the centre of the duct as shown in Figures 15 and 16.

If the radio wave comes from above the duct, assuming that the duct is smooth, it can be refracted out again and not stay in the duct at all and sub-refraction occurs, Figure 16. If the radio wave is able to maintain exactly the right position and stay within the duct the wave is able to travel great distances by super-refraction, Figure 17. This is difficult to achieve as the duct will probably not have exactly the right refractivity gradient to achieve this.

It is more likely that when the radio wave enters the duct it will repeatedly enter and leave the duct by refraction along the lower side of the duct and by this means travel great distances. This concept of repeated refraction is able to explain long distance propagation via ducts with the variable refractivity gradients that are more evident in practice. The angles of refraction are of course very small as each refraction may be up to 50 km apart, Figure 18.

As the trapping angle of the signal to the duct increases the radio wave is less likely to be refracted enough to stay in the duct and it will reach the point where it will pass through the duct, Figure 19.

So far only a smooth duct has been discussed. Surface waves associated with the formation of the duct, Figures 7 and 8, cause the surface of the duct to be rough in a manner that the surface of the ocean is roughened by the wind across its surface. This roughness due to gravity waves can readily be seen on the top of elevated ducts, it has a wavelength of about 4 km (not electromagnetic wavelength).

These surface waves provide a lower limit to the duct trapping angle so that higher frequencies with smaller duct trapping angles cannot be propagated via the duct. For instance, a duct roughness length of 4 km and a variation of the duct vertical position of +/-2 m results in a duct roughness angle of about 0.1 degrees. This means that frequencies which require duct entry angles of less that 0.1 degrees cannot be sustained in the duct because the duct surface waves cause them to "spill out". This provides an upper limit to the frequencies that a particular duct can propagate. The only way that higher frequencies can be propagated via a duct is for the duct depth to decrease, for the duct gradient to increase and/or the duct roughness to decrease. This provides a reasonable explanation as to why weak ducts cannot propagate microwave signals and why frequencies of up to 10 GHz are only rarely propagated over long distances via a duct because the very strong ducts required occur only rarely.

The surface waves allow signals to enter and leave the duct more easily so that the duct is "leaky" along its entire length, Figure 20. As the turbulence scatters the radio signal, there will be an associated loss of the signal because of the multiple refractions from the rough duct surface.

The entry angle to the duct is a critical factor and is a reason why stations at higher elevations are able to use the duct over greater distances than stations at lower altitudes. As the ducts become more extreme the refractive gradients are higher and the entry and exit angles are consequently smaller. This is the reason that under some very good conditions stations towards the middle of the path

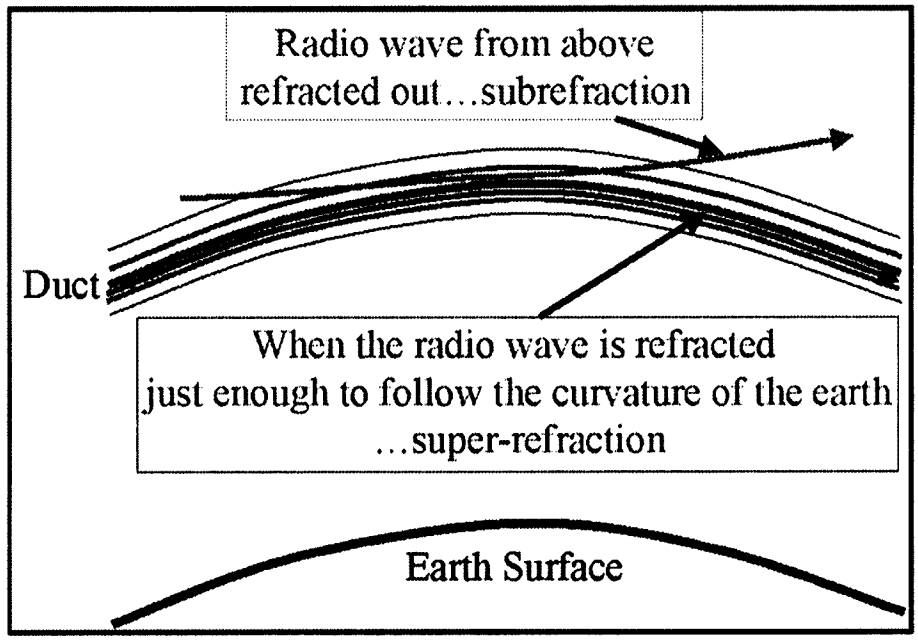


Figure 17. When the radio wave is refracted from above the duct the wave can be refracted out of the duct in a process known as sub-refraction. When the radio wave is in the duct it can be refracted just enough to stay within the duct so that super-refraction occurs and the radio wave travels over great distances if the temperature gradient is optimum. Slight changes in the temperature gradient would prevent the signal from maintaining its position in the duct.

where refractive gradients are higher, can be "passed over" and miss out on the DX altogether.

The concepts developed here are able to explain all of the effects noted earlier and provide a better understanding of the characteristics of elevated ducts and how VHF and microwave signals interact with them.

To return to the issues:

- The concept that ducts act as a wave guide is probably incorrect. The signals travel along the duct by multiple refraction from the surface roughness of the duct. The duct acts as a "boundary layer" by guiding the signals around the surface of the earth by multiple refraction from rough surfaces.
- The ducts are frequency dependent where the lower frequency limit is related to the duct strength and depth while the upper frequency limit is set by the duct roughness.

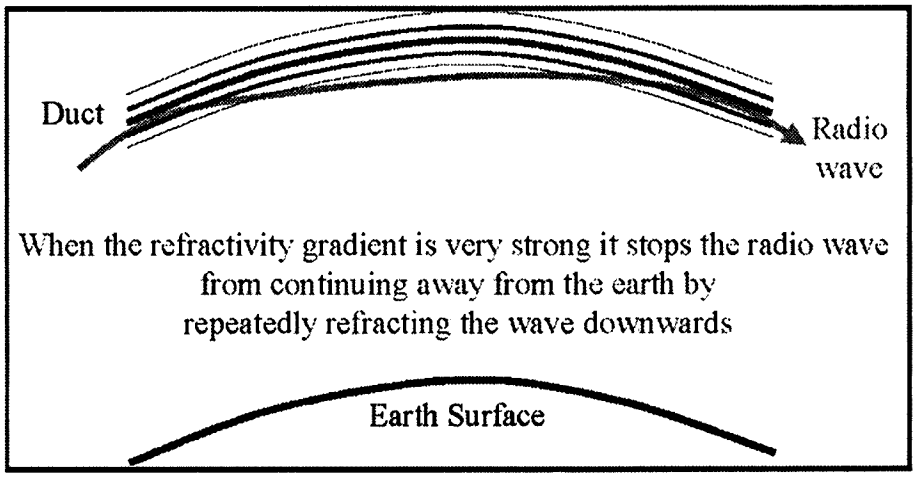


Figure 18. The radio wave does not stay exactly in the duct but is repeatedly refracted out only to re-enter at greater distances. This process more easily describes the observations and the ability of the duct to propagate many different frequencies depending on the duct temperature gradient.

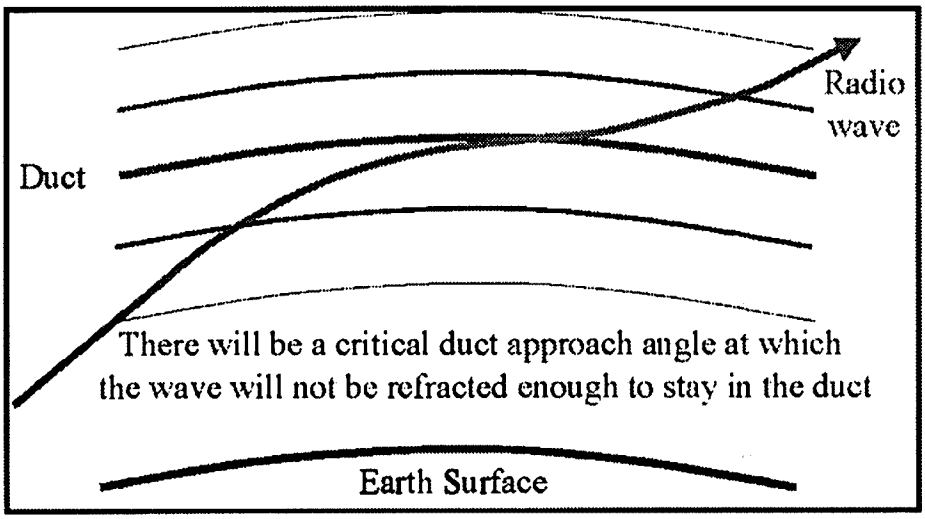


Figure 19. If the angle of the signal to the duct is larger than the duct trapping angle the signal passes through. This is a frequency dependent effect.

- It sometimes appears that coupling to the duct is only at the ends. Coupling towards the middle of the duct depends on the strength of the duct and the entry angle so for some stations well below the duct it may appear as if the coupling is only at the ends.
- It is not essential that the antenna is "in the duct" but clearly closer to the duct is better and is illustrated by the higher placed stations working more DX via ducts.
- Evaporative ducts only occur over water. Radiation cooling is the cause of ground ducts over land unless of course a lake is present in which case an evaporative duct also occurs.

Summary

From the results of many observations and the development of a better understanding of the characteristics of elevated ducts the following results and observations can be summarised:

- Elevated ducts remain elevated, they form and break up at a given height, the height of the 600 m elevated duct does not change with the evolution of the high-pressure systems.
- Surface ducts rise and break up during the day and fall in the evening to reform near the surface, they do not rise to sufficient height or remain strong enough to propagate VHF/UHF signals over long distances.
- The radiosonde provides a reasonable indication for predicting ducts but it is limited in resolution and often misses key structures. Radiosonde measurements are excellent when there is nothing else.
- Ducts act more like a boundary layer by repeatedly refracting VHF and UHF signals resulting in long distance propagation.
- The smaller the entry angle (closer) to the duct the better the coupling of signals into the duct.
- Characterizing the duct as a "wave guide" is probably incorrect given the evidence.
- The duct is frequency dependent, band pass, the low frequency cut-off being determined by the duct depth and strength while the high frequency cut-off is determined by the duct surface roughness.
- Surface evaporation ducts occur over water, surface radiation ducts occur over land.
- Stations at higher elevations are able to work more duct related DX than stations at lower elevations because of the reduced entry angle into the duct with higher elevations resulting in better signal levels from distant stations.
- High-pressure systems in the Great Australian Bight are probably the only mechanism required for elevated ducts to form, no other mechanisms are required.
- The duct in a high-pressure system is at approximately the same height over the whole high-pressure system.

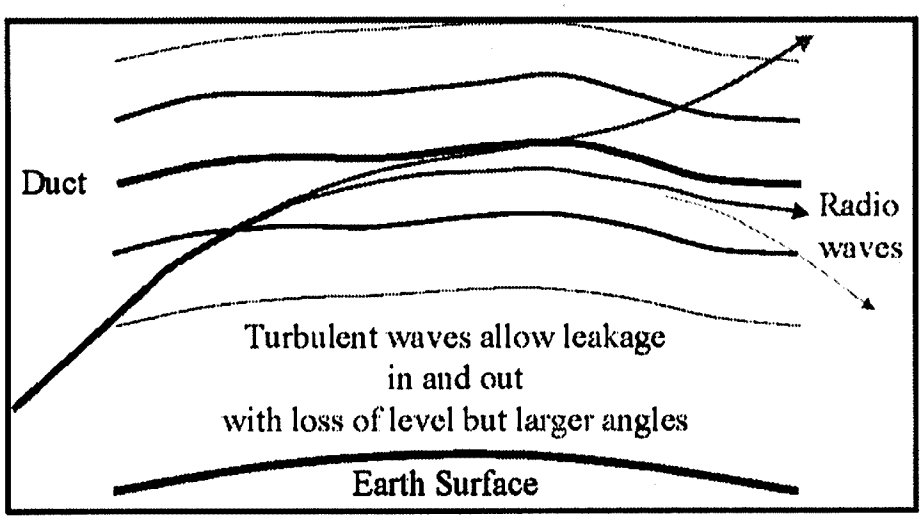


Figure 20. The duct surface is not smooth but rough allowing signals to enter and leave more easily, also resulting in an upper frequency limit for the duct.

Acknowledgment

Tele-IP Limited is acknowledged for providing data from its StratoSonde SODAR for use in this paper [9]. The many contributions from other amateurs by way of observations and just being there to make a contact are also acknowledged.

References

[1] R. A. Hull, "Air-Mass Conditions and the Bending of Ultra High Frequency Waves", QST June 1935.

[2] Isted G A (1958) Guglielmo Marconi and communication beyond the horizon: a short historical note.

IEE Symposium on Long-Distance Propagation above 30 Mc/s, 28 Jan 1958. Pp. 79-83.

[3] Howard Oakley "The history of VHF propagation beyond line of sight", http://www.quercus.demon.co.uk/thistory.html.

[4] Kerr D E (1951)(editor) Propagation of Short Radio Waves. Reprinted by Dover Publications INC, New York, 1965

[5] Howse, W. J. "VHF, UHF and Microwave Propagation and The Great Australian Bight", Amateur Radio, Vol.69, No.3, March 2001, PP 4-7.

[6] Papers first presented at GippsTech 2003 and 2004.

[7] Consolidated and revised version of the paper published in 2004 by the NSW VHF Group,

[8] S. A. Isaakidis and T. D. Xenos, Progress in Electromagnetics Research,PIER 49, pp 257-271, 2004.

[9] http://www.stratosonde.com

[10] A. L. Martin., "A New Technology SODAR; Providing Very High Spatial and Temporal Resolution Profiling to 1800 m", In Proc. 12th International Symposium on Acoustic remote Sensing, 11-16 July 2004, Clare College, Cambridge UK, pp 153-157.

[11] R. Blackwell et. al, The VHF/UHF Handbook, UK, DIR Publishing, First Ed, 1992. pp. 2.23–2.24.

[12] ITU-R Study Group 3, Recommendation P.530-1999.

[13] Andrew. L. Martin, "Considering the Impact of the Draft New ITU-R Working Party 9A Report on the Design of Line-of-Sight Microwave Radio Systems" Proc. of the 7th ECRR, Dresden, Germany, 12-15 September 2000, pp 263 – 268.

[14] http://pcl.physics.uwo.ca/pclhtml/gravitywaves.html

[15] http://weather.uwyo.edu/upperair/sounding.html

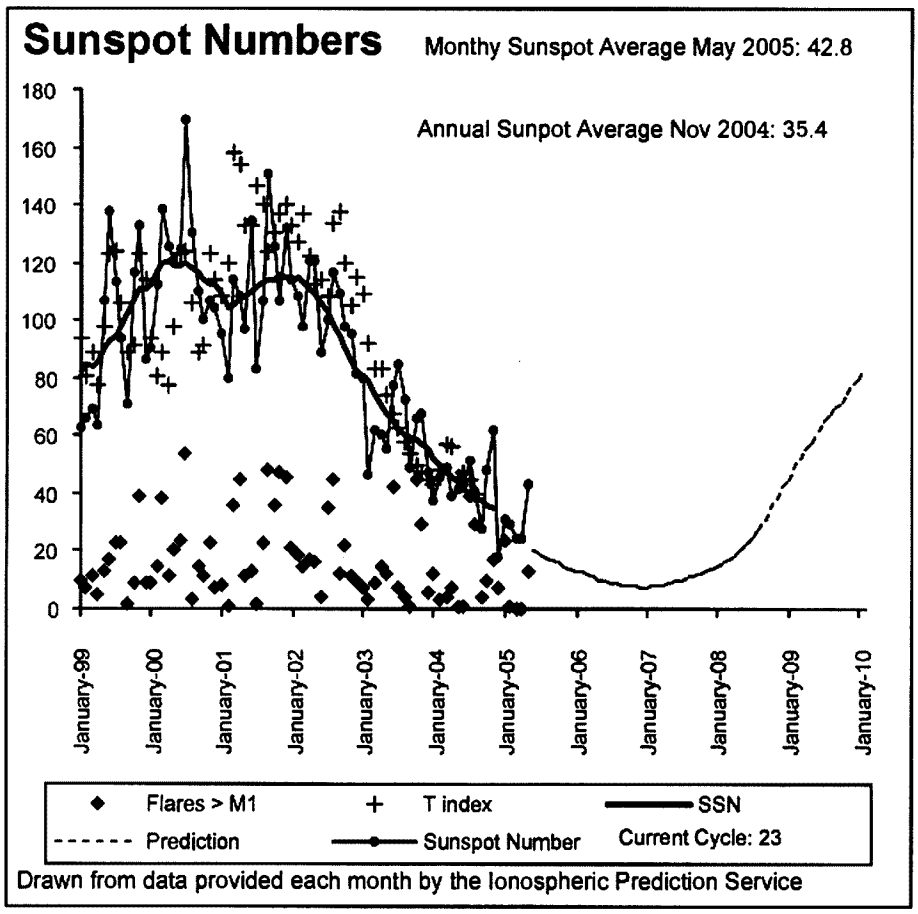
[16] J. A. Hermann et.al. "Impact of Elevated Atmospheric Structures Upon Radio-Refractivity and Propagation", http:/www.ips.gov.au/IPSHosted/NCRS/wars/wars2002/proceeding.

[17] I. M. Brooks et. al. "Observations of Strong Surface Radar Ducts Over the Persian Gulf". www.env.leeds.ac.uk/~ibrooks/ publications/JAM1999-radar-ducts.pdf.

[18] A. D. Papatsoris, "Spectrum Monitoring and Measurement Techniques", http://www.dtk.gov.mk/Portals/57ad7180-c5e7-49f5-b282-c6475cdb7ee7/Space-wave%20Propagation.ppt.

[19] "VHF – UHF..An Expanding World", Amateur Radio, Vol.71 No. 2, February 2003.

ar



WIA news *continued*

power distribution system.

If the Motorola BPL system were used in Australia and New Zealand, unacceptably high levels of interference to HF users might still occur due to the increased length of line carrying the BPL signal into the home, and the likely necessity for higher injected power to enable the BPL signal to span that greater distance.

WIA President and Vice President attend the NZART Conference

WIA President Michael Owen, VK3KI and Vice President Ewan McLeod, VK4ERM attended the NZART annual Conference held in New Plymouth on the weekend of 4 and 5 June 2005.

Michael and Ewan were invited to attend the NZART council meetings before and following the traditional Queens birthday weekend conference.

In a speech at the Annual Dinner, Michael stressed the importance to the WIA of its relationship with NZART.

During the meetings it was agreed that NZART and the WIA would work more closely in relation to Standards and to explore the production of a joint reference CD.

ar

Women in radio

Christine Taylor VK5CTY

ALARA turns 30

On this, the thirtieth anniversary of the founding of Australian Ladies' Amateur Radio Association Inc. (ALARA), it is appropriate that we recognise two "women in radio" who represent two of the faces of ALARA. ALARA was founded in July 1975 by a group of VK3 YLs.

Myrna VK5YW

Myrna VK5YW was one of the first interstate members and conducted the first Nets held on HF.

The list of stations on those early nets is interesting because while there were some YLs with their own callsigns there were a number of others, as XYL of XXX, operating with their OMs in the shack with them. There were also quite a number of OMs who joined in without a YL present. The one thing that was obvious was that there was a lot of interest in the amateur community in this new "special interest" group.

Myrna got her licence in April 1975. She would love to have been assigned the callsign VK5YL (Young Lady) but was quite happy with VK5YW (Young Woman) instead. If she had passed her Morse sending exam at the first try she would probably have been given the 5YL callsign, instead it was Denise who became VK5YL

Denise had previously held the callsign VK1YL so was understandably given 5YL when she moved to VK5. There had been an earlier YL amateur, Betty, from Murray Bridge who held the VK5YL callsign from 1936 till the outbreak of WW2. Because she did not take up her radio interests after the War the callsign was available again.

An early picture of Myrna VK5YW operating as net controller for the first ALARA 80 metre nets

Myrna and her OM, Norman VK5NM had become interested in amateur radio after they had found their house was back to back to that of one of the government telegraph operators during their time in New Guinea. When they moved to South Australia Norman attended classes at the WIA. He got his licence in October 1965. Sometime after that Myrna went along to classes, too.

Myrna was the only YL in her class, an experience shared with many other YLs. The course started with 20 students but finished with only ten of whom Myrna was one. One particular memory of those classes that illustrates how things have changed was the smoking in class. Back in 1975 there was nothing unusual about most of the students, and often the teacher, smoking throughout a lesson. Unimaginable these days!

Myrna and Norman had built his first transmitter but bought a new Tentech rig for HF when Myrna got her licence. They mounted their aerial on a tower which still stands in the backyard though it has no aerial on it now. Both were dedicated CW operators from the beginning.

Unfortunately only thirteen months after Myrna got her licence Norman became a Silent Key. Myrna kept on operating on HF for several years but the pressure of being a working Mum with three children meant that there was little time for radio, so, rather than see the Tentech become valueless as it was replaced by more modern rigs, Myrna did sell it. She kept up her VHF, though, and well remembers one particular trip from Adelaide to Brisbane with the children, when she was directed almost all the way by local amateurs on 2-metres.

They made sure she turned the right way, and got onto the right road, as she drove along. There is nothing like local knowledge to keep you on the best roads, is there? Back in the 80's the roads through the middle of Australia were not nearly as good as they are today. You could very easily have found yourself in trouble without some local help.

Myrna VK5YW

As a country girl herself, she grew up in Salter Springs in the Mid-North of SA, where her father was a Soldier Settler; Myrna has always had an affinity with country people. She still has family in Salter Springs whom she visits regularly.

Myrna kept up her membership of ALARA even after she gave up operating. She has attended many of the Birthday Luncheons and now that she has at last retired from work, she looks forward keenly to the monthly lunches in Adelaide.

ALARA'S Birthday

Each year we celebrate our birthday on the 4th Saturday in July with a Birthday Net, from 1000 to 1200 UTC on 3.588 MHz ±
We welcome YLs, whether you are a member or not, to come on air and have a chat.

Maxie DL4YL

Within a year of the foundation of ALARA, early members were applying to sponsor their DX friends into ALARA. This was the beginning of our sponsorship arrangements. There is no obligation to sponsor anyone, but for some of us, it is the most interesting part of our membership. Sponsors exchange badges and other items that relate to the YL organisations in other countries. They send each other Christmas and birthday greetings and introduce them to their families. They become friends without necessarily ever meeting.

Maxie is one of the DX members of ALARA. However Maxie is different because she is also a regular visitor to Australia. Maxie and her sister, Marile (not an amateur) come here every three years or so. They have amateur and other friends in many places and plan their trips around seeing these people, while seeing much, much more. In fact they have probably seen more of Australia than most of us.

Maxie and her husband Heinie both passed their amateur licence exams in April 1958. Maxie did not ask for but was given the callsign DJ4YL and Heinie DJ4KU. They had become interested a couple of years earlier through Walter DJ2WS, becoming Short Wave Listeners first (for which there was an exam).

Heinie and Maxie had separate rigs. Heinie had a Heathkit DX 100 transmitter and a Geloso receiver, while Maxie used a BC 348 receiver and a handmade COPA for CW in her parents' house before they married. They both used CW exclusively until quite recently when Maxie joined her local club and bought a VHF handheld and started using phone. Heinie was probably the most frequent user of the amateur station but Maxie had a regular sked on Wednesdays and participated in contests from time to time

Heinie was a white stick operator as the result of an accident as a child. He was also a lawyer and eventually a judge. Maxie became his reader etc almost from the time they met as university students interested in music. Nevertheless, through amateur radio both of them made friends around the world through their hobby. On several occasions when these DX ham friends were travelling around Europe they stayed with Maxie and Heinie.

Heinie died very suddenly in 1986, which changed Maxie's life entirely. She still reads books for the blind and has become a proof-reader for a publishing house among the other interests of music and amateur radio.

Now, as Maxie and Marile come to Australia (which they love) they visit the VK amateurs. They stay with or near Syd now VK4STC but formerly a VK3 amateur, and in VK5, they stay in a granny flat at the home of Sheila, widow of Bill VK5VK, an arrangement that pleases everyone. It was Bill who first introduced Maxie to ALARA because he got in touch with me back in 1991 when he knew Maxie was coming to visit him and Sheila. ALARA invited them to one of our regular luncheons and it all went on from there.

Through ALARA they have met Dot VK2DB and her OM John VK2ZOI, and quite a number of the ALARA YLs in VK5 so Maxie and Marile plan their tours to include visits with them, too. A very enjoyable arrangement all round.

With Bill and Sheila they have spent some time on Kangaroo Island. With me and my OM Geoff they have stayed at our bush shack near Swan Reach, but on their own they have visited the Bungle Bungles, Katherine Gorge, most of the National Parks in New South Wales and Queensland to name just a few on and off the beaten track places

Maxie DJ4YL with her sister Marile with a friend at Cleland National Park

On their most recent trip they arrived in Adelaide from Melbourne via the Great Ocean Road. On that particular tour they were almost the only passengers so they probably saw more that usual - and loved it all. Then, before they left SA they spent a week camping on the Coorong. As I say they have seen much more of Australia than most Australians, all because of amateur radio. It is a great hobby, and a great way to make friends.

ar

News from...

QTC to live on

June 2005 is a very historic month indeed, as the last stand-alone issue of the journal of renown QTC has been published. QTC was first published in July 1927 following the inaugural meeting of The Queensland Radio Transmitters League (eventually to become the QAC). Leo J Feenaghty VK4LJ was the first Editor, Bruce VK4EHT the last. The objective of QTC was plainly spelt out in the first paragraph of the first issue: "With this issue of QTC the Queensland Radio Transmitters' League enters upon the second state of its activities, that of organised publicity and promulgation of reports of its doings and Plans for the future."

July 1980, Editor David Jones VK4NLV (now VK4OF) polled members about the content and future of QTC. Interest in QTC grew back and the magazine adapted to meet the needs of the Queensland membership. At the February meeting of the WIA-QAC the decision was made to discontinue the pamphlet production of QTC, QTC now to be part of the National WIA publication Amateur Radio with the unique masthead, which retains the heritage of QTC.

QSL Bureau calling

The current managers of the VK4 Inwards QSL Bureau, Shirley VK4HSG and David Gulley VK4DCG will step down by the end of this year. So if you have the calling to serve our Hobby in a most important way, contact the WIA-QAC or Shirley and David and ease yourself into the life as a QSL Manager.

The North Queensland Amateur Radio Convention 2005

That premier event on the worldwide Amateur Radio calendar is taking place again in 2005.

VK4

The North Queensland Amateur Radio Convention will be happening during the day at the Douglas Campus of James Cook University and during the night at Anita's Restaurant, Cluden Park Motor Inn from Friday September 16th to Sunday September 18th. For information pack and registration form either surf to http://www.vk4tub.org/tarc/convention.htm or request one from vk4wit@wia.org.au

A limited number of printed copies is also available from most Queensland radio clubs.

City of Brisbane Club

Just received some great news from Mick VK4NE. Seems his club's 6-metre repeater on 53.975 is up and running again after replacement of both its antennas. More details on this work will be disclosed at their June 14th meeting.

Brisbane VHF GROUP Repeaters

The Brisbane VHF Group owns and operates two significant Brisbane area repeaters, namely VK4RBN on 147.0 MHz at Mt Glorious and VK4RBC on 438.525 MHz on Mt Coot-tha. The Group would like to remind users of these repeaters that licensing and maintenance of them costs money on a recurring basis. Although obviously we can not ask for financial support "on air", support in a tangible way by repeater users is very welcome. Contact the Group Secretary Jason VK4YOL at 10 Geraldine Street, Wavell Heights, 4012, or go along to a meeting. VHF group says, "thanks in anticipation of your support!"

ATV SEQ-ATV Group

VK4RSS SSTV repeater is back on line after a long absence. Location is Ocean View north of Brisbane. It has an extensive coverage north to Caloundra and south of Brisbane so give it a try. Frequency is 438.575 MHz (negative offset). This repeater has SSTV priority with voice transmissions secondary. John VK4ET provides a replay of your pictures if desired. A 1750 Hz access tone is required. Replay operation time is approximately 0900 to 2000 hrs daily. In addition John VK4ET has established a HF SSTV repeater from his location at Brackenridge on 24.940 MHz USB. His antenna is a Delta loop at about 13 metres in height with a TX power output of 60 watts. A 1750 Hz tone is required for access. Repeater operation times are approximately 0900 to 2000 Hrs daily. Please give it a try. Reports are welcomed.

Bundaberg and Hervey Bay WICEN

The combined training day for Bundaberg and Hervey Bay WICEN groups was held several weeks ago, 15 attended and Acting S.E.S. Controller Richard Cooley welcomed the members and, for the Hervey Bay contingent, pointed out the vital role played by Bundaberg WICEN in providing all radio comms for Welfare.

Rusty VK4JM presented the program for the day which included: The role of WICEN; Message writing procedures; Standard operating procedures, forms to be used and the comms Diagram. Activation of Bundaberg WICEN. Practical operations including setting up a station. The debrief and close at about 1600 hrs completed a very successful day and Hervey Bay went home fired with enthusiasm and ready to set up a group at the Bay.

The last word

You have all heard the quotation "A database is accurate at one point in time" (or similar). Well, the QTAC one 'ain't' any different. So, would you all take a look at http://vk4radio.info and check out the listings of repeaters and beacons. There are lots of blank spaces in things like HASL (ie: Height), Time Out, and we even suspect that some repeaters and beacons may not be operational. So if you know the missing bits or know that any data needs to be amended, then please send an advice to QTAC at their address, which of course is qtac@wia.org.au

Your QTAC men - Andrew, Don, Len and Bill would love to hear from you.

VK7

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

More VK7 records set

On May 8, 2005 Joe, VK7JG worked Johan, ON4IQ on 6 m EME using the mode JT65A. Joe believes this is the first ever VK7 6 m EME contact and may also be an Australian 6 m EME record at a distance of 17,023.9 km. Joe commented "that all this has been made possible with Rex VK7MO providing the enthusiasm and encouragement and Joe Taylor, K1JT's WSJT programme."

BPL in VK7 – Aurora Energy's 2nd trial

By the time you read this, the BPL trial would have begun. July 4 was the official start date and what appears to be the infrastructure for the BPL rollout is appearing on power poles around Hobart. A mobile field strength team has been assembled and is ready for field measurements. A VK7 BPL Watch web page has been established on the Regional website and is regularly updated as information comes to hand.

Congratulation to VK7MO

Rex, VK7MO scoops the pool in the Ross Hull Memorial VHF-UHF Contest 2004-2005! The new digital section of this revised contest was convincingly won by our very own Rex, VK7MO. This is an excellent result, congratulations Rex.

YL Voice Net

Early Sunday mornings has seen Shirley, VK7HSC involved in a regular YL Net using IRLP. 0700 local time and the net can be found on IRLP reflector 9258. This net's early time allows contacts to be made worldwide and the net controller is John, KC8FCW. This has been arranged through the packet YL group. OMs are welcome too!

Did you miss that VK7 Regional Broadcast?

No worries – it is also available via e-mail mailing list and on the Internet. The easiest way to subscribe is click on the link on the front page of the regional website. The e-mail and Internet versions of the Regional news also gives you all those Internet and e-mail addresses that are not read out when it goes to air. If your e-mail mailbox is already overflowing then you can read the broadcast online at the regional website and head to the VK7 Regional News page.

Central Highlands Amateur Radio Club of Tasmania

A quick reminder to put the Wadda Cup contest in your diary – 24th September 2005.

The club is holding its winter getaway weekend at the Liawenee (please note change of location). The weekend is set to start on Friday July 22nd until Sunday July 24th. Comfortable accommodation is available. BYO is the go. If you need accommodation, you must confirm a booking with David, VK7KDO on 6273 0642. We hope to see you there.

North West Tasmania Amateur Radio Interest Group

NWTARIG Membership Certificates are now available, and members are asked to make arrangements for collection by contacting Tony VK7AX on 6425 2923. Activity on SSTV is increasing in the NorthWest area using 2 m on VK7RMD and the SSTV Internet gateway of VK7AX. Experimentation also includes digital SSTV. 'Spectrum Extra' is now being aired Thursday nights at 19:30 on Northern repeaters with many interesting segments being broadcast.

Northern Tasmanian Amateur Radio Club

The June 8th meeting saw Norm, VK7AC update the club on the BPL trial. Allan, VK7AN and Kevin, VK7KVN then gave excellent talks the G5RV versus the Carolina Windom, a good night's entertainment. A reminder that the Mt Arthur repeater (VK7RAB) is a solar powered and less sun = less charge to the batteries. For cross-town contacts please use VK7RAA.

Radio and Electronics Association of Southern Tasmania Inc.

We welcome Damien, VK7HDS to the amateur airwaves. Damien is one of our HF CB rebroadcasters and got his amateur ticket recently. VK7RAD repeater now has a 2 m output back and operating on 147.975MHz. This repeats all it hears from 70 cm and 6 m. VK7RBW has also been repaired and updated and now requires a 123 Hz CTCSS tone to access. By the time you read this, the REAST WICEN group will be doing last minute preparation for the VK7 leg of the Subaru Safari 2005 on 9 & 10 July. Good luck.

On June 1st, Graham Lill, VK7ZGL who is a traffic engineer gave a fascinating talk on traffic management and engineering in and around Hobart including the Tasman Bridge and Cat's Eye corner on the Southern Outlet. Thanks Graham.

ar

Silent Keys

Don Brooks, Ex VK7DB.

Don will be remembered in Ham radio circles, together with the late Peter Frith VK7PF, as being instrumental in achieving the first VHF contact between Mt Barrow and Mt Wellington in 1954, a significant and historical event.

Don was an active amateur up till the last ten years or so when failing health confined his activities to his home and immediate family.

Vale Don.

Alex Szopko VK7CS

Alex obtained his Amateur Operator's Certificate of Proficiency in 1970 with the callsign VK7CS. Alex then obtained his Telecommunications Technicians Part-1 certificate from the City and Guilds of London Institute in 1971. Alex was also a member of the Australian Institute of Science Technology. Alex retired in 1990 and continued his passion with electronics, radio, and computers until the end.

Vale Alex

ar

ALARA

Christine Taylor VK5CTY

The Contest is coming!

Next month is a busy one. In the middle we have the Remembrance Day Contest and at the end we have the ALARA Contest. Please don't forget either of them. In the Remembrance Day Contest we recognise those who went to war on our behalf and in the ALARA Contest we celebrate the women amateurs who make up a small but important proportion of the amateur world.

To make sure we have plenty of time to chat the ALARA Contest runs for 36 hour and includes two sessions on 80 metres. This band is the one which best allows amateurs within Australia to talk to each other, and the evenings are the best times for this frequency. However, do not ignore the other bands and times. Make sure you call often and try to make contact with YLs in other parts of the world.

Don't forget that CW contacts on any band can be scored toward the Florence McKenzie Trophy. It is time we have another winner. Why not give it a try? In case you are not sure why only CW contacts score toward this award, it is because, during WW2 Florence VK2FD taught over 30, 000 men and women, to be CW operators. She was instrumental in persuading the government to enlist women as telegraphists, which released more men for other duties. She was also the very first VK YL amateur.

OMs please join in our Contest and give us some points. Unfortunately you can only get points toward the Contest when you make a contact with a YL but it can be made with a YL anywhere in the world.

We welcome the logs from OMs and need all the logs from the YLs participating. We always hear more stations than we receive logs so why not make it different this year? The Contest Manager is again Marilyn VK3DMS QTHR the callbook and at gsyme@wia.org.au

The ALARA Award

If you have participated in the ALARA Contest you may have made enough of the right combination of contacts to be eligible for the very elegant ALARA Award. You need ten contacts with ALARA members, which must include contacts with five different VK states.

All bands and all modes are acceptable. Applications to Jean Shaw through the QTH of her OM VK3YL.

If you need those extra states to qualify at a time when the ALARA Contest is not on, why not call in toward the end of one of the Monday night Nets. If you say you want contacts for the ALARA Award we will gladly stay on after the Net to give you the legal connect.

The ALARAMeet

Have you booked your caravan site or cabin or room yet? The time till we all meet in Mildura is getting shorter. If you have been to an ALARAMeet before, you know you will have fun whether you are a YL or an OM. If you haven't been to one yet, maybe this is the year.

We have a number coming from New Zealand and a few from other DX places. Some of them are 'old hands' some are going to be at their first gathering. All will be welcome.

If you are a local Mildura amateur, YL or OM, please get in touch with Marilyn VK3DMS and come along to our Dinner on the Saturday or participate in some of the other outings and activities. We are usually lucky enough to have few locals along, wherever we go. There is nothing like local knowledge to tell us visitors what else there is to see, round about, in case we can stay for longer than just the weekend of the ALARAMeet.

Please come along and help us celebrate the 30 years since those first YLs decided they should form themselves into their own organisation within the WIA and the amateur world.

The ALARA Sponsorship Scheme

Almost as soon as ALARA was formed in 1975 the members decided to do as other YL organisations were doing, to have sponsored members from overseas. The idea is that when you make DX friends you can sponsor them into ALARA. Most often they make you members of their home group, too, but there is no requirement to do so.

There is no requirement on our members to sponsor anyone, though many do so.

Most YL organisations have regular newsletters through which they keep in touch with what others are doing. Quite a number of people send notes to the editors every so often so we also keep in touch with what they are doing. It is always interesting to read about the activities happening in other parts of the world.

We usually exchange letters at Christmas and birthdays if we know when they are, and now in these days of emails we often exchange little items of interest we come across. Some sponsors both in Australia and overseas are good correspondents and some are not - but that is the same for us all with our friends and families, isn't it?

ALARA has a Sponsorship Secretary who arranges sponsors for anyone wanting them. She also announces every now and then that she has been asked for a VK sponsor for someone overseas. She rarely has to wait long before a member offers to take on the new person.

As ALARA members we pay a membership fee for our sponsored members and if they have a reciprocal arrangement they pay for us to be members of their group. The cost of the memberships only cover the cost of the magazines so it is not expensive. It certainly is worthwhile.

ar

DX - news & views

John Bazley VK4OQ,
P.O. Box 7665,
Toowoomba Mail Centre, QLD 4352.
E-Mail --- john.bazley@bigpond.com

When I wrote in May – 'that there is no doubt that DX appears to be alive and well in Australia' I had no idea that Mai – VK6LC would be announcing the new W.I.A. 3 & 5 Band DXCC awards – great news. It will be interesting to see how many people apply for them.

CQ Magazine announced in March the revival of a yearly DX award ' The Annual DX Marathon.' which was last run by CQ in 1948. The revived CQ DX Marathon will be essentially a year-long DX contest, with stations competing to contact as many different countries ("entities") and CQ Zones of the World as possible over a full-year period, then starting again at zero at the beginning of the next year. The programme was outlined for the first time at the International DX Convention in Visalia, California on April 16th last. Scoring will be very simple, consisting of the total number of DX entities and CQ zones contacted over the course of a year. There will be no multipliers and each country and zone will count only once. In the case of a tie, the station whose last qualifying contact came earliest in the year will be the winner.

Complete details and rules will be posted on the CQ website (www.cq-amateur-radio.com) after the May issue of CQ magazine is in subscribers' hands. The first event will commence in 2006.

So how have you found conditions on the LF & HF bands during the past few weeks? As the sunspots continue to decline it is interesting to see the increased activity that has taken place on 10.1 MHz. There have been some really good openings on that band particularly as more amateurs are realising its potential. There are now far more rotary beams and phased arrays being used than 12 months ago which I imagine accounts for some really outstanding DX signals 'popping up' on an apparently dead band!

Now to DX News!

VU4 Card Clarification NC1L

Bill Moore, DXCC Manager.

We are accepting VU4RBI/VU4NRO QSO cards. A few cards have been rejected on the basis of incomplete information on the cards.

If you received a QSL card complete with all data (time, date, band, mode and callsign), there is no problem. If you have a QSL card with less than complete data (callsign only, missing time/date, etc.) we will need to see the card at HQ. This is usual procedure. Blank cards and cards missing information are always subject to inspection at HQ. Do not add the missing information. As always we strive to maintain the highest integrity possible in the DXCC program.

Taking just two – at random – of the DX operations last month.

Did you catch the recent short operation from Market Reef OJ0VR by OH1VR, Seppo? In 19 hours they made some 850 QSOs with 100 watts and a Windom. He reports this was his last trip to OJ0. Seppo goes on to report he has plans - starting in mid October to travel around the world in 60 days in celebration of his 60th birthday. He expects to start on October 17th and spend 10 days on each of the six continents. Final plans will be announced in August. We could have some 'interesting DX spots' - QRX as this one continues to develop. Or Hans A25/DL7CM and A25/DM2AYO who were active on all bands.

Since the last edition of DX News & Views there have been several operations from Pacific Islands and of course the WPX Contest. The latter produced some great opportunities to work some of the more rare spots activated specifically for the Contest. Hope that you managed to work some 'wanted' countries or specific bands .

What have we got to look forward to ?

The next DXpedition which I am sure will be of interest to many VKs is the planned trip to Kure KH7C from September 24th to 8th October. Four stations will be active. Operators will be KK6EK, NI6T, N6MZ, N0AX, N7CQQ, W6KK, DJ9ZB, I8NHJ, K6SRZ, K6DZL.

From 26th July to 5th August (three days longer than originally intended) W8GEX, K8LEE and W9IXX plan to activate Sable Island CY0AA on 160 to 6 metres CW,SSB,RTTY and PSK. QSL to K8LEE. Logs will be on line and updated daily --- http://www.wb8xx.com/sable .

More information is now available on the planned trip to East Kiribati T32 that I mentioned last month. It is planned to operate from two new IOTA islands – the first will be Flint Island and if they are unable to land there they will try to do so on Vostok Island. The other will be Millenium Island. The operators will be IT9YRE, I1SNW and IT9EJW.

F5CW reports that the expedition to Glorioso Islands FR/G has been postponed. Apparently the French military authorities discouraged the team from landing in late May for security reasons. Further updates will be posted to http://glorieuses2005.free.fr/: Dany said "we are a bit upset with this situation but we never give up".

VK9XD Christmas Island. David-VK2CZ plans to operate from there 25th October to 6th November taking in CQWW SSB Contest as SO/AB. QSL via VK6NE (vk6ne@upanaway.com) [Neil Penfold, 2 Moss Court, Kingsley – WA 6026, Australia].

VK9XG Christmas Island. Charlie-W0YG will also be there the same times as David. QSL to his home call.

SV9/F8UFT Crete Claude-HB9CRX will be active from the 17th July until 31st July 40-10m, CW, QSL via F6ICG or vis the bureau .

3V8SM Tunisia operating from 26th July until 31st July including the IOTA Contest using 80-10m, SSB, RTTY and

continued on page 37

Beyond our shores

David A. Pilley VK2AYD
davpil@midcoast.com.au

Malaysia:

HF privileges granted new hams

Some good news for hams in Malaysia who have been waiting all their lives to receive High Frequency operating privileges. 9W2JAR reports that this dream has finally come true for some of them.

Jaja says over qrz.com that a total of 19 "B licence" hams passed the Morse Test held at the Malaysian Communications and Multimedia Commission headquarters from March 29th to the 31st. They were granted the 9M2 prefix callsign as new Malaysian ham radio ambassadors.

This was the first time the Malaysian Communications and Multimedia Commission has organised the Morse Test since it took over the management of Amateur Radio hobby from Department of Telecommunication a few years ago. The last time a Morse Test was held was in the year 1997. (9W2JAR)

(ARNewsline)

Vatican:

Ham radio dying in the Vatican

Ham radio could soon be a thing of the past in the Vatican. This is because there are no longer any H-V prefix stations to man the controls. Amateur Radio Newsline's Mark Abramovich, NT3V, was in Rome covering the selection of the Catholic Church's new pontiff when he discovered that ham radio operations from all three Vatican stations may soon be QRT for good.

Mark spoke with Monsignor Lombardi who handles communications for the Vatican TV and Radio about the Vatican's ham stations and was shocked to learn that they had all fallen silent. That's right, he says HV1CN, assigned to Vatican Radio, as well as HV5PUL, operated out of the Pontifical Lateran University, and HV3SJ, held by the Jesuit house in the Vatican City, were all inactive.

If Vatican ham radio is to survive, it looks like it will take an experienced DXer with some good diplomatic skills to get in touch with the Vatican or the North American College to offer an assist in keeping it alive.

(ARNewsline ™)

U.S.A.

Law enforcement

In May bail was set at a quarter of a million dollars (US$250,000) for a former Radio amateur who was arrested on May 5th and charged with interfering with various radio services. The judge who set bail said the bond would have to be fully secured. This means that he must put up cash or property in the amount of US$250,000 to secure his release from custody. The arrest followed alleged jamming of radio frequencies being used by the United States military, the United States Coast Guard, law enforcement and public safety agencies including those used by ham radio operators. Assuming that the person is able to make bail, a spokesman in the US Attorney's office said the person would be subject to home detention and barred from possessing any radio equipment. The person might also be fitted with a tracking device like that worn by millionaire business woman Martha Stewart since her release from jail. And like others under government watch, the residence would remain subject to search at just about any time.

(ARNewsline)

Sweden:

Deregulates amateur radio

Sweden's telecommunication regulatory agency PTS has taken steps to deregulate Amateur Radio and essentially no longer requires a government licence. Effective last fall, the PTS turned over Amateur Radio operator "certification" to the Society of Swedish Radio Amateurs (SSA), that country's IARU member-society. Under the new regulatory regime, the SSA administers testing and issues operator certificates and call signs, which have SA prefixes and three-letter suffixes. There's no longer a Morse code requirement for HF access.

The PTS still handles relevant international agreements, such as band allocations, in conjunction with the ITU. Sweden no longer dictates mode-specific sub-bands within amateur bands, but band plans are in place.

The new call signs can be issued by both the SSA and the PTS, but the SSA option reportedly is less expensive. All previously issued Swedish call signs are valid for life. Foreign visitors from countries outside the CEPT agreement must still apply to the PTS for temporary operating authority in Sweden.

(ARRL News)

Kenya:

More bands available

Kenya's telecommunications regulator, the CCK, recently issued a new schedule of Amateur Radio frequencies, modes and power limits. Ted Alleyne, 5Z4NU, of the Amateur Radio Society of Kenya reports that radio amateurs there now may use 30 meters (10.100 to 10.150 MHz) and 160 meters (1.810 to 1.850 MHz).

(ARRL News)

Thailand:

New bands for contests

The National Telecommunications Commission of Thailand has granted permission through 2005 for all Thai radio amateurs to use 80 and 160 meters during contest periods. HS- and E2-stations may use 1.800-1.825 MHz and 3.500-3.540 MHz, CW or SSB, during contest weekends.

(ARRL News)

Czech Republic:

New regs in force

Starting May 1 in the Czech Republic, new regulations provide access to 7.100 to 7.200 MHz for Amateur Radio on a secondary basis. Power output is limited to 250 W PEP. The Czech Republic also has begun issuing Novice class licences with OK9-prefix call signs and three-letter suffixes. Operation is permitted on 160, 80, 15 and 10 meters on HF, and up to 2 meters on VHF, at a maximum power output of 10 W.

(ARRL News)

continued on page 37

Bill Magnusson VK3JT

Hamsat a great success

After some weeks away from home, during which time HAMSAT was commissioned and renamed VO-52, I finally had an opportunity to fire up the gear and have a listen on Jun-5.

It was good to hear so many stations on the satellite. I heard calls from VK2-3-4-6-8 and ZL in just one pass. During the latter part of the pass I heard a noteworthy contact between VK6 and ZL, a very good effort since the satellite would have only been two or three degrees in elevation at both ends of the QSO.

Signals were excellent with little or no QSB. When VO-52 was high in the sky even one watt into the beams was enough for a strong downlink signal. VO-52 is a low earth orbiter. It carries a linear transponder. As with any other satellite supporting SSB or CW modes and in a similar low orbit, the rapid rate of Doppler variation can be a problem near the middle of overhead passes. It can be quite a challenge to keep your signal from drifting away from the starting frequency.

Mode-A was a piece of cake but once 70 cm or higher comes into the picture; it's not so easy. There has been much written on this subject over the years and opinions differ as to the best method of coping with the effect. Many operators adhere to the idea of leaving the receive frequency fixed and tuning their transmit frequency to keep the SSB resolved in the receiver.

Others like to tune the higher of the two frequencies as their preferred method. In the case of mode U/V, ie. the old mode-B, the transmit frequency IS the higher of the two so there's no argument between devotees of the two systems.

However, neither of these methods is completely successful in keeping a QSO on the same frequency for any length of time and will not absolutely guarantee not running into another QSO at some time. Only a completely computer controlled system of tuning can hope to do that.

Some people have been experimenting in this field and claims are being made that their systems are more or less successful. The jury is still out though and most who have tried the methods still report that the software and indeed the radios are not yet completely up to the task. This is an area where more development is likely to take place and - who knows - a successful method may be just around the corner.

By contrast, complete Doppler control for FM has been around for many years now and is totally adequate for voice or digital work even at microwave frequencies but SSB is another story.

Have a go at VO-52. It doesn't require highly directional antennas with auto-track. The power requirements are modest. Have a listen. You may be moved to try for a return signal. Then you can see if you are up to the challenge of fast moving Doppler. Good luck!

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

Half-yearly update of operational satellites

We'll give pride-of-place this time to the newly launched Indian HAMSAT,

VO-52

Launch Date: May 05,2005

Status: operational with Indian transponder.

Current Mode: U/V

Indian transponder:

Uplink : 435.225 MHz to 435.275 MHz LSB/CW

Downlink: 145.875 MHz to 145.925 MHz USB/CW

Beacon : 145.940 MHz continuous carrier signal

Dutch transponder:

Uplink : 435.225 MHz to 435.275 MHz LSB/CW

Downlink: 145.875 MHz to 145.925 MHz USB/CW

Beacon : 145.860 MHz 12 WPM with CW message

AO-51 ECHO

Catalogue number: 28375

Launch date: June 29, 2004

Status: Testing

Current Mode: PBBS and FM REPEATER – ON

Analog voice downlink: 435.300 MHz FM

Analog voice uplink: 145.920 MHz FM 67Hz PL tone

1268.700 MHz FM 67Hz PL tone

Digital Downlinks: 435.150 MHz FM, 38k4, 1 watt output

2401.200 MHz FM 38k4 bps

Digital Uplink: 145.860 MHz FM, 9k6 Digital

Broadcast: PECHO-11

BBS: PECHO-12

International Space Station (ISS) – ARISS

Status: Packet radio operational, occasional voice.

Worldwide packet uplink: 145.990 MHz FM

Region 1 voice uplink: 145.200 MHz FM

Region 2/3 voice uplink: 144.490 MHz FM

Worldwide downlink: 145.800 MHz FM

Repeater Uplink: 437.800 MHz FM

Repeater Downlink: 145.800 MHz FM

Russian callsigns RS0ISS, RZ3DZR

USA callsign NA1SS

Packet station mailbox callsign RS0ISS-11

Packet station keyboard callsign RS0ISS-3

Digipeater callsign ARISS

You will need to work out the most likely times to find someone at the microphone. The ISS daily crew schedule can be found at the following web site: http://spaceflight.nasa.gov/station/timelines/

Remember that the crew operates on UTC time. Since the Space Shuttle problems the crew work load has been very heavy and voice transmissions have been limited almost entirely to scheduled school contacts.

AO-7 AMSAT OSCAR 7

Catalogue number: 07530

Launch Date: November 15, 1974

Status: Semi-operational in sunlight.

Return to active status: June 21,2002

Uplink: 145.850 to 145.950 MHz CW/USB Mode A

432.125 to 432.175 MHz CW/LSB Mode B

Downlink: 29.400 to 29.500 MHz CW/USB Mode A

145.975 to 145.925 MHz CW/USB Mode B

Beacon: 29.502 MHz, 145.972 MHz, 435.1 MHz, 2304.1 MHz

FO-29 JAS-2

Catalogue number: 24278

Launch Date: August 17, 1996

Status: Operational

Voice/CW Mode JA

Uplink: 145.90 to 146.00 MHz CW/LSB

Downlink: 435.80 to 435.90 MHz CW/USB

Beacon: 435.795 MHz

Digital Mode JD

Uplink: 145.850 145.870 145.910 MHz FM

Downlink: 435.910 MHz 1200-baud BPSK or 9600-baud FSK

Callsign: 8J1JCS

Digitalker: 435.910 MHz

SO-50 SAUDISAT-1C

Catalogue number: 27607

Launched: December 20, 2002

Status: Operational.

Uplink: 145.850 MHz (67.0 Hz PL tone)

Downlink: 436.795 MHz (possibly 5kHz high)

To switch the transmitter on, you need to send a CTCSS tone of 74.4 Hz.

The order of operation is thus: (allow for Doppler as necessary)

1) Transmit on 145.850 MHz with a tone of 74.4 Hz to arm
2) the 10 minute timer on board the spacecraft.
3) Now transmit on 145.850 MHz (FM Voice) using 67.0 Hz to PT
4) the repeater on and off within the 10 minute window.
5) Sending the 74.4 tone again within the 10 minute window will reset the 10 minute timer.

UO-11 OSCAR-11

Catalogue number: 14781

Launched: March 1, 1984

Status: Silent, may be out of service.

Downlink: 145.826 MHz FM (1200-baud AFSK)

Mode-S Beacon: 2401.500 MHz

Nothing has been heard from this satellite since 2005-05-01

More information on UO-11 OSCAR-11 can be found at: http://www.users.zetnet.co.uk/clivew/

AO-16 PACSAT

Catalogue number: 20439

Launch Date: January 22, 1990

Status: Semi-operational, the digipeater command is on and open for APRS users.

Uplink: 145.90 145.92 145.94 145.96 MHz FM (using 1200-baud Manchester FSK)

Downlink: 437.026 MHz SSB (1200-baud PSK)

Mode-S Beacon: 2401.1428 MHz

Broadcast Callsign: PACSAT-11

BBS: PACSAT-12

GO-32 TECHSAT-1B

Catalogue number: 25397

Launch Date: July 10, 1998

Status: Operational but signal weak and subject to deep fading

Downlink: 435.225 MHz FM (9600-baud FSK)

Uplinks: 145.850, 145.890, 145.930 FM 1269.700, 1269.800, 1269.900 FM

Broadcast Callsign: 4XTECH-11

BBS Callsign: 4XTECH-12

NO-44 PCSAT

Catalogue number: 26931

Launch Date: September 30, 2001

Status: Operational but has passed its use-by date. If you intend to give this bird a go, familiarise yourself with the latest situation by visiting the AMSAT-NA web site.

Uplink/downlink: 145.827 MHz 1200 baud AX.25 AFSK via W3ADO-1

Aux/Uplink: 435.250 MHz 9600 baud via PCSAT-2 (off)

APRS Downlink: 144.390 MHz (Region 2)

Below is a list of the amateur radio satellites, which are in orbit but are not operational over VK-ZL at this time.

The list is included because a number (eg. AO-10) are possibly experiencing temporary failure due to battery problems when in eclipse. In addition, the remarkable experience with AO-7 may inspire you to keep a listening watch on the downlink frequencies of these birds in the hope of hearing something. Who knows? You may be the first to report an old satellite springing into life again. A full listing of frequencies is available via the AMSAT-NA web site and the keplerian elements are all listed on SpaceTrack.

AO-10	AO-27 is not switched on in the southern hemisphere
AO-40	AO-49
FO-20	IO-26
KO-23	KO-25
LO-19	MO-46
NO-45	POSAT-1
PO-34	RS-12
RS-13	RS-15
SO-33	SO-35
SO-41	SO-42
UO-14	UO-22
UO-36	And now possibly UO-11.

The above information is as usual gleaned from the AMSAT-NA News Service which is available to all by way of the AMSAT-NA web-site, www.amsat.org.

Goodies on the drawing board

PCSAT2

Will be carried to ISS on the return to service of the Space Shuttle. It will be fixed to the outside of ISS during a space-walk. PCSAT2 will use the same dual redundant AX.25 command and control system as used on PCsat (NO-44) offering 8 on/off commands, 5 telemetry channels and a serial port for the solar cell experiment telemetry. It also supports the Digital Comms Relay support of the PCsat/APRS mission. The packet uplink is on 145.825 MHz and the default downlands are in the 435 MHz band to avoid any possible interference with existing ARISS missions. PCSAT2 will have quad redundant transmit inhibits for EVA safety issues, thus, it is also easy to turn off to avoid any issues with other UHF ARISS experiments that may be activated in the future. Note that the mission lifetime of PCSAT2 is only 1 year. It is a sample-return mission, so there will not be any long term frequency or overload conflicts in spectrum management on ISS.

The PCSAT2 mission has several potential uses:

- A UI-Digipeater to help ease congestion on the currently shared ARISS PMS (Packet Mail system)
- A PSK-31 transponder for multi-user communications to improve accessibility for schools and ARISS outreach programs.
- An FM Voice repeater for full duplex crew communications to facilitate crew-to-school ARISS contacts.
- Routine Telemetry on the spacecraft systems.

Thanks to Bob, WB4APR for the above information.

Phase 3E

The proposed launch date for Phase 3E is early 2006. It is under construction at present. The AMSAT-Phase 3E satellite (P3E) is a communication and scientific platform destined for a highly elliptical orbit around the earth. The spacecraft is a joint project together with the P5A Mars mission and is being built by an international team under the leadership of AMSAT-DL. Additionally the spacecraft will be a test bench for technology developed for the P5A Mars mission. The main task of P3E is to act as communication platform for radio amateurs worldwide.

SSETI Express launch date announced

The launch date for SSETI Express and three 'cubesats' has now been confirmed as 25 August 2005, with the next day, the 26th, as a back-up. The satellite has now completed all its pre-launch tests and is presently back in the clean room where everything is having a final checkout and where the cubesats are being loaded into their launchers. Current plans show that the satellite will be packed and ready for dispatch to the launch site during the last week of June. SSETI Express will automatically downlink general telemetry at 9k6 on 70 cm and it will also be possible for amateurs to request specific downloads. It is planned that the 38k4 telemetry transmitter on 2.4 GHz will also be available for amateur voice operation as a Mode U/S transponder after initial tests on the satellite have been completed. AMSAT-UK provided the 2.4 GHz transmitter for the satellite.

ar

DX – news & views *continued*

PSK31. QSL via EC4DX.

J79PAK Dominica Pierre-HB9CUA plans his operation from 11th July until 3rd August he will be running 100 W on 40-6m. QSL via bureau or to his home call.

OX/EA3EKS Greenland, Hector should be active from 2nd to 5th August. QSL direct to his home call.

ON5NT, Ghis Penny, is back at home for a month of R & R but will be heading back to the United Arab Emirates on May 31st. He plans to be there for one month. QSL A6/ON5NT via ON5NT.

UT4UT, Nick Davydchenko, has postponed his IOTA trip to the Burmese island group of Irrawaddy/Yangon/Pegu (AS-167), which was expected from May 20 to 22. He now thinks his XY4U operation will take place in July.

STOP PRESS News.

Guy - FR7ZL - will be operating from FW8ZL from 13th July until 12th August on CW & SSB on 10.1 –14 –21 MHz. QSL direct only.

Comments, news & views please by August 8th for September Amateur Radio.

Special thanks to the authors of QTC DX PY2AA --- The Daily DX (W3UR) and 425 Dx News (I1JQJ) for information appearing in this months *DX news & views.*

ar

Beyond our shores *continued*

Malta:

CW operation needs exam

The Malta Communication Authority has automatically extended HF privileges to "codeless" Class B licensees. However, licensees in Malta still must pass a Morse code examination to operate CW on the HF bands.

Japan:

Relax Morse requirements

The Japan Ministry of Internal Affairs and Communications (MIC) took action May 24 to relax Morse code requirements for Amateur Radio licensing, but it did not eliminate them altogether. Effective October 1, 2005, the MIC will reduce the requirements for First and Second class licenses to 5 WPM – solid copy for two minutes. The previous code requirements for these licences were 12 and 9 WPM respectively. The MIC will drop the Morse requirement, now 5 WPM, for the Third class licence

(ARRL News)

ar

Another DC to DC converter for laptop use

Warren Stirling VK3XSW

The DC-DC converter described here is a modification of the K091 kit that was available from Oatley Electronics (http://oatleyelectronics.com/kits/k091.html) and is an extension of modifications suggested by Gil Sones, VK3AUI, to the original silicon chip design in an article posted to the wicen data group web site (http://datagrp.vic.wicen.org.au/lptpps.htm).

The Oatley kit is based on the original Silicon Chip sla battery charger design but provides for a higher output current and to this end includes a 40 A fast diode and a 40 A mosfet. Input and output filtering is also included.

I have modified the Oatley kit to provide the 18 V dc @ 1.8 A I needed to run a Toshiba laptop from a 12 V dc supply. The picture below shows these modifications:

A 470 µF 25 V electrolytic capacitor is added across the output. The original Silicon Chip design has a similar capacitor (250 µF) but the Oatley Electronics kit omits it. For a DC/DC converter application the capacitor is mandatory or the output will be unstable.

All the modifications described here refer to the component designations on the original Oatley electronics kit circuit, which is available for download at http://oatleyelectronics.com/pdf/k091.pdf. Diode D1 is changed from a 1N5404 3amp diode to a 6A40 6amp diode and fuse F1 is changed to a 5 amp type. This is because the output current requirements are greater than the original design allowed for so the input protection has been upgraded accordingly.

The kit provides wire to wind the current sensing resistor R2 and suggests two lengths in parallel for high output currents. This has been done in the prototype.

Capacitor C3 is changed from a 330pF ceramic to a 100pF high stability type; this roughly triples the oscillator frequency and makes a significant improvement to the conversion efficiency. Substituting a high stability capacitor for the new C3 and also the existing C4 makes the circuit largely immune to temperature variations.

A 10k 10-turn preset is added in series between the existing r6 (22k) and pin 6 of ic1 (mc34063ap1). This allows

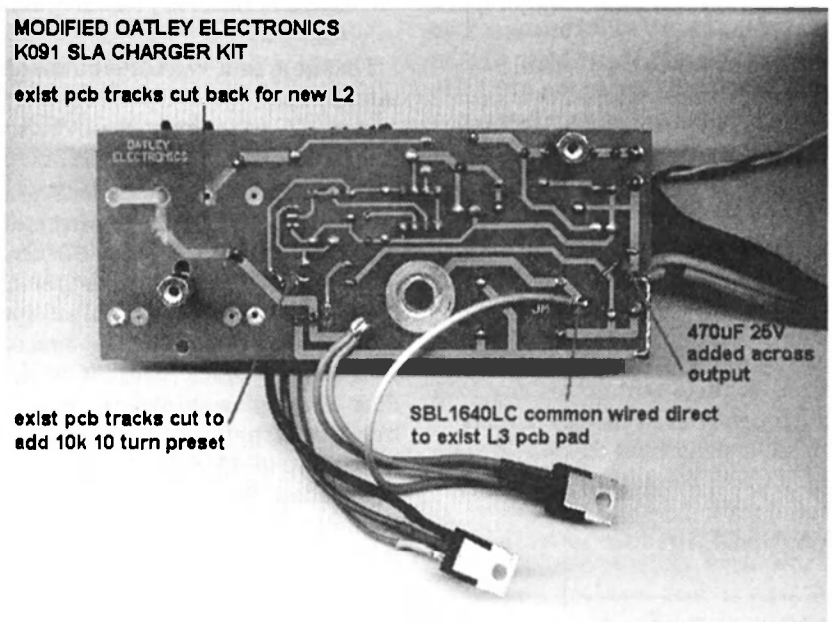


Photo 1

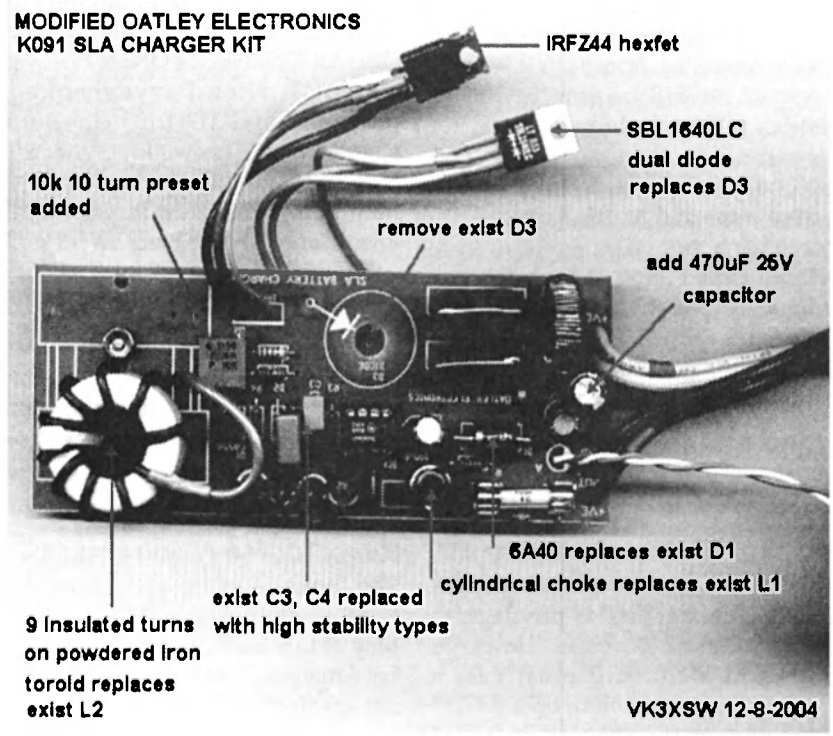


Photo 2

setting the output voltage between approximately 13.8 V and 19 V. The original split ferrite inductor supplied with the Oatley kit, L2, is replaced with a powdered iron toroid salvaged from a dead pc atx switchmode power supply. The toroid used in the prototype is painted yellow (permeability=8) and is approximately 27mm outside diameter, 14mm inside diameter and 11mm wide.

The salvaged toroid has all of the original windings removed and a single 9 turns evenly spaced winding added. In the prototype this winding was made from the 1mm copper wire used in one of the original windings and was covered in heat shrink to preclude the winding shorting to the toroid material, which is conductive. The new toroid is held flat to the pcb with a single cable tie.

Diode D3 is removed and replaced with a SBL1640LC removed from the same dead atx switch mode power supply as the new inductor L2. The original diode (a Motorola Z122108) does not switch fast enough with the higher oscillator frequency and generated significant heat. The replacement SBL1640LC has two high speed switching diodes mounted in a TO-220 case and, in comparison to the Motorola diode, runs almost cold. For this application both diodes are wired in parallel. Since both are on the same substrate no current sharing method is used between the diodes.

I've also tried an SBL2040LC recovered from the same dead atx power supply. This is also a dual diode package, using the larger top-3 package, the DC/DC converter efficiency is not as great when using it and the SBL2040LC got hotter than the SBL1640LC.

The input filter inductor L1 has also been replaced, with a rod type, which is 6mm diameter and about 11mm long. The winding is 15 turns of 1mm enamelled copper wire. While this wire has less resistance than that of the original toroidal inductor (and therefore won't get as hot for the same current draw) I've found that changing the input inductor only has a significant impact on the heat produced by the fet and the switching diode, both components are almost room temperature at sustained full output. The new L1 does get warm but runs much cooler than the original inductor it replaces.

The original output inductor L3 does get warm but I've found that changing it drops the converter efficiency and other components start getting hot.

I'm guessing that the " L" input filter (series L1 and parallel C2) and the π output filter (series L3 and parallel C5, C6) form a tuned circuit and changing either inductor (the easiest component to change) makes a significant impact on the converter efficiency and heat produced!

Both the SBL1640LC dual diode and the existing IRFX44 hexfet should be mounted on a heatsink, even though they ran at nearly room temperature in the prototype. They will need to be insulated from the heatsink as the metal tab on each of their cases has an electrical connection. In the prototype the metal case was used as the heatsink and also helps to suppress radiated interference from the converter.

The following measurements were taken on the prototype unit:

Input	Output	Efficiency
11.45v@3.8a	17.02v@1.8a	70%
13.8v@3.15a	17.72v@1.8a	73%
14.5v@2.8a	17.72v@1.8a	78%

ar

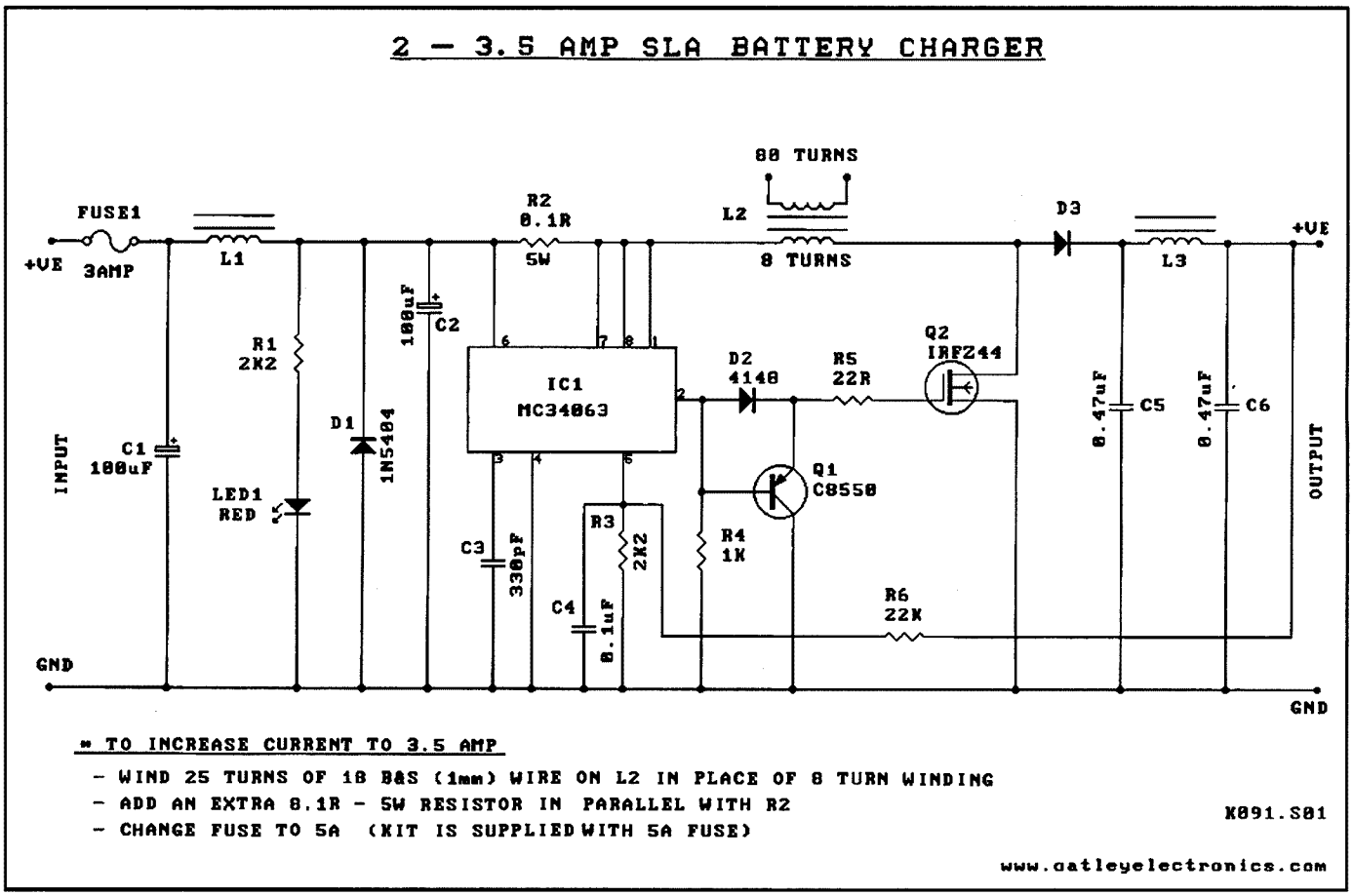


Figure 1

Contests

Ian Godsil VK3JS

Contest Calendar July – September 2005

July	1	Canada day Contest	(CW/SSB)
	9	VK/trans-Tasman 160 Metres Phone Contest	
	9/10	IARU HF World Championship	(CW/SSB)
	16/17	CQ WW VHF Contest (All modes)	
	23	VK/trans-Tasman 160 Metres CW Contest	
Aug	5	QRP Day Contest	(CW/SSB/FM/PSK31)
	6	TARA Grid Dip	(PSK/RTTY)
	6/7	10-10 Intl QSO Party	(SSB)
	13/14	Remembrance Day Contest	(CW/SSB/FM)
	20/21	Keymen's Club of Japan Contest	(CW)
	20/21	SEANET Contest	(CW/SSB)
	27	ALARA Contest	(CW/SSB)
	27/28	TOEC WW Grid Contest	(CW)
	27/28	YO DX HF Contest	(CW/SSB)
Sept	3	Russian RTTY WW Contest	(RTTY)
	3/4	All Asian DX Contest	(SSB)
	10/11	Worked All Europe DX Contest	(SSB)
	24/25	CQ WW RTTY DX Contest	(RTTY)

Greetings to all readers.

Last month I presented a pessimistic prediction in the hope that some of us may be stimulated into overcoming a level of apathy that I suspect exists in the Australian Amateur Radio Service. This month I am so pleased to comment on anther side of the picture through the results of the Harry Angel Sprint – see below.

Harry Angel Sprint

A very sincere thank you to those who gave time and effort to taking part and to those who also sent logs. A distinction must be made here, as there always seem to be more operators on air in a contest than ever send in logs.

The sending of the log is the final step of the "taking part" in a contest. It is not a question of finish or be buggered, I'm better than you, right or wrong, I didn't do too well so why bother, but simply a record of what you managed to achieve with your station.

It is particularly pleasing to note the participation of many of the newcomers to HF. I hope that they enjoyed the experience and will be motivated to try other events.

By the time you read this I expect the participants to have received their results and certificates.

For those interested in statistics, here they are for this event –

Total Logs: 23, via email 14, via mail 9
CW 3, SSB 18, Mixed 2

An apology to Andy Wood VK4KY and to all the other entrants in the Angel Sprint for a typing error in the results which were sent. That error has been corrected in the list below.

Points for thought

- Some comments were made that one station was so loud that it splattered over a wide band of frequencies. Do we need to run the full legal limit for contests within Australia?
- One correspondent complained that the event was not on ANZAC Day as listed on the SM3CER web site. Against this three operators said how glad they were that it was NOT on ANZAC Day, because of the length of the day already for many veterans, eg often up at 0400 hours for Dawn Services and Marches.
- I am genuinely concerned at the absence of VK6s, presumably because of the time of the contest, but also because of the difficulty in working across VK on 80 metres. Would another band or time make things more equable?
- VKs seem a long way behind the rest of the world in using loggers for contest work. Partly this is because of the unusual nature of some of our scoring systems compared to DX contests. However, as part of our code of keeping abreast of technology, if you have a shack logger with a contest module, or a dedicated contest logger, then PLEASE play with it at home and see if you can adapt the scoring to our local contests.

Also relating to contest logging, most loggers will score in the now world-wide accepted Cabrillo format. If your program does that, then please send

your log in that format as many Contest Managers now have this facility; also, if you are into DX contests, then this is the ONLY format that you will use for a legal entry these days.

- Several entrants in the Angel Sprint did not send addresses. If you read carefully you will see that you are asked to submit not only your log, but full details of who and where you are. There are good reasons for asking for this information and whilst you may think 'let the Contest Manager look it up', I assure you that this takes a very long time. Please abide by ALL the rules, including the Summary Sheet. (As a matter of interest, the Cabrillo logging format mentioned above does all this for you!)

If you have any comments on any of these points, please write to me, preferably via email as soon as possible, as I shall be in VK4 for several months with only limited access to email.

The Future

The Harry Angel Sprint is now history for 2005, but this month there will be the Jack Files, the 160 metre sections of the VK/trans-Tasman and next month the RD (see rules elsewhere) and ALARA Contests.

In their own ways these are all challenges to our technical and operating skills. Will you meet those challenges? I hope so.

73 and good contesting,

Ian Godsil VK3JS
Federal Contest Co-ordinator

Results of the Harry Angel Sprint 2005

CW			MIXED		
1st place	VK3JS	24 points	1st place	VK2BPL	64 points
2nd place	VK4AQ	20 points	2nd place	VK5UE	13 points
3rd place	VK4BUI	18 points			
SSB					
1st place	VK4KY	63 points	2nd place	VK5SR	57 points
3rd place	VK4YZ	55 points	4th place	VK2LCD	41 points
5th place	VK3EK	38 points	=6th place	VK6ZN/2	36 points
=6th place	VK7VH	36 points	8th place	VK4KSS	32 points
9th place	VK5YX	29 points	10th place	VK4SN	28 points
=11th place	VK3SC	26 points	=11th place	VK4FJ	26 points
=13th place	VK5HCF	25 points	=13th place	VK3PRA	25 points
15th place	VK4DMC	24 points	16th place	VK7JGD	21 points
17th place	VK3MUD	18 points	18th place	VK2JHN	14 points

VK2 news — Karuah Valley Radio Group

Exam Results

Grahame O'Brien
Exams Group leader, Karuah Valley Radio Group
02 49548688 vk2fa@arrl.net

It gives us great pleasure to inform you of the results of candidates who have done their amateur radio license exams with the Karuah Valley Radio Group.

The Group has conducted 2 examinations, the first examination being on Sunday 3rd April 2005. At this examination we had 4 candidates 3 novice candidates with 2.5 Hams being created. The .5 was a pass in regulations. We also talked one of the novice candidates into doing the extra full call exam paper that comes for emergency use. This candidate passed both and was very pleased that he did undertake both examinations.

Our 2nd examination was held on Wednesday 18th May, where we had 4 of 5 candidates pass. I think you would have to attribute the high pass rate to the Ron Bertrand course. All candidates had done Ron's wonderfull course

I would like to let you know of the success of 2 of the candidates, Ben Brice and his girl friend Penny Middleton.

Ben's father is Graham VK2VV and I must say that Graham has a smile from ear to ear.

Ben is only a few weeks away from going to spend 6 months in the jungles of East Timor as a volunteer worker. This being the situation Ham radio will be his only easy access to the outside world.

Ben only decided to do his exams 2 weeks before our exams were going to be held. I had a copy of Ron Bertrand's Novice course and I loaned it to Ben until the CD arrived from Ron.

Ben's Girl friend Penny was helping Ben with his study, Penny saw that the course structure was one that she thought that she would be able to pass and she decided that she would also sit for the exams so she would be able to talk to Ben whilst he is doing his work in the jungle.

I have to say it is very refreshing to see these outstanding young people coming into our hobby.

I think there are 2 factors that we can attribute to Ben and Penny's success: They are, the concentrated and dedicated effort that was put in by Ben and Penny and Ron Bertrand's ability to get the message across in his novice CD course.

The Karuah Valley Radio Group will be running more exams in the future and we would like to hear from any prospective candidates that might require our service.

The examination group leader for the Karuah Valley Radio Group is Grahame O'Brien and Grahame can be contacted of an evening on 02 49548688

The Karuah Valley Radio Group would also like to thank the staff in the national WIA office for their help in the processing of Ben's results so he can enter into negotiations with the United Nations to get an East Timor callsign before he leaves on his adventure.

ar

2005 Remembrance Day Contest
August 13–14

Introduced by Chris Edmondson VK4AA

Along with a new Contest Manager for this year come new rules and, importantly, a new way of determining the overall winner. The formal rules for the 2005 Remembrance Day Contest appear on the next page.

The RD Contest is an important event on the Australian amateur calendar, with heavy participation by individual operators and serious competition between states.

But we felt that some of the spark was dimming a little, and this year's changes are aimed at restoring the drive and renewing the enthusiasm in the grand old lady. We specifically wanted to strengthen the RD without confusion, and hope the new rules will help the RD retain its rightful place as the premier Australian contest event.

The Remembrance Day Contest for 2005 will be held on August 13-14 2005, for 24 hours commencing 0800 UTC on the Saturday evening.

Firstly, in essence, what won't change is the spirit of the thing. We haven't meddled with the basics which make the RD so very special. The winning state will be the one which stands head and shoulders over the rest. Those things won't ever change. Other things will.

Our first presents are to HF operators, who can now claim double points for all contacts in excess of 1000 km on any HF band. Contacts with any station within VK8, VK9 and VK zero will also earn double points for both sides of each contact. Logs for VK5 and VK8 will from 2005 be considered as coming from different states.

Logs should still show sequential numbers starting at zero, with bonus points tallied at the end of the contest and added to the claimed score.

SSB and CW will continue to be separate modes on HF, and, subject to licence privileges, any operator who works stations using 10 metres FM above 29 MHz will have the opportunity to immediately re-log the same station using SSB or CW below 29 MHz.

On VHF, we'll forge ahead by going back to the days when VHF operators could work a station on FM and immediately rework them on SSB or CW, or, indeed, both. This provision was inadvertently changed several years ago when the then manager moved to ban completely automated exchanges between packet stations.

The effect it had was to almost totally eradicate CW and SSB contest operation on the VHF and higher bands. This year we redress the situation.

From 2005, your VHF log can include stations worked on CW, FM or SSB. You do not need to separate the logs according to mode, nor do you need to apply contact numbers according to mode. However, you will continue to need separate logs for HF and VHF categories, due to the different rules applying to the two categories.

Many operators concentrate exclusively on VHF and higher band operation, and many of them will have seen that stations which might be very strong on six or two metres could be substantially weaker on 70 cm, and probably all but inaudible on higher bands. From 2005 we seek to address this imbalance by offering reward-based incentives for putting the work into higher band operation. Bonus points will be offered for both long distance contacts and higher band contacts.

All contacts on bands above 70 cm will attract double points, irrespective of and in addition to any other incentives already offered. They join 160 metre band HF operators who have enjoyed double points for some years, as have all CW operators.

From this year onward, HF operators using either 10 or 160 metres will be able to work stations within their own state boundaries.

We did consider also allowing WARC band operation, but decided to restrict HF operation to the 160, 80, 40, 20, 15 and 10 metre bands only.

When polled for comment on a recent VK1WIA broadcast, a number of people asked about multiple contacts. Until now, dupes were not allowed on HF but were allowed on VHF after only two hours. The VHF arrangements will not change this year. However, from 2005, repeat HF contacts will be allowed after four hours. This will encourage both more and longer operation, and real participation in the fun.

What's more, there's a special time for all operators still on the air between 1 am and 6 am local time. All points scored during those wee hours will be doubled. If you work a station whose time zone means they are outside the 1am to 6am point, only your points will be doubled. Although the contest runs during UTC times, the special "night owl" loading is determined strictly by your time zone.

Until the 1970s ushered in substantial VHF operations, a very convoluted point-scoring system was in place for HF, in which more points were allocated for contacts spanning multiple call areas than ones to neighbouring states. Even with computer technology, scoring could be a time-consuming process indeed, and very confusing for entrants.

However, it does seems appropriate to offer modest bonuses for better distances covered. From 2005 any HF contact in excess of 1000 km will earn double points, as will any VHF or higher contact which exceeds 100 km.

For scoring purposes, too, determining the overall winner is a different affair this year. The RD has always been state against state, but determining the winner was a confusing process involving overall "improvement factors". From 2005 on, who wins is a simple question of how many people take part from each state and actually submit logs. More than ever before, then, for your state to win, submitting your log is vital.

That's a basic summary of the changes. Each is designed to boost your scores without making the scoring too messy for either the competitor or the manager.

We would be remiss in not noting the excellent work of the outgoing manager of this contest, Alek Petkovic, VK6APK, who devotedconsiderable time and effort to the RD for more than 10 years. Thanks Alek

Good luck, and good contesting!

ar

Rules — 2005 Remembrance Day Contest

13/14 August 0800z Sat to 0759z Sun

Presented by Chris Edmondson, VK4AA

Purpose:

This contest commemorates the amateurs who died during World War II and is designed to encourage friendly participation and help improve the operating skills of participants. It is held close to 15 August, the date on which hostilities ceased in the southwest Pacific area.

It is preceded by a short opening address by a notable personality transmitted on various WIA frequencies during the 15 minutes prior to the contest. During this ceremony, a roll call of amateurs who paid the supreme sacrifice during WWII is read.

A perpetual trophy is awarded annually to the Australian State or territory with the best performance. The name of the winning State or Territory is inscribed on the trophy, and that State or Territory then holds the trophy for 12 months. The winning State or Territory is also given a certificate, as are leading entrants.

Objective:

Amateurs in each VK call area will endeavour to contact amateurs in other VK call areas, ZL and P2 on HF bands 1.8 to 30 MHz. On 50 MHz and above amateurs may also contact other amateurs in their own call area.

Contest Period:

0800 Z Saturday, 13 August to 0759 Z Sunday, 14 August, 2005. As a mark of respect, stations are asked to observe 15 minutes' silence prior to the start of the contest, during which the opening ceremony will be broadcast.

Rules:

1. Categories:
   (a) High Frequency for operation on bands below 50 MHz;
   (b) Very High Frequency for operation on and above 50 MHz;
   (c) Single Operator;
   (d) Multi-operator;
2. Within each Category the Sections are:

(a) Transmitting Phone (AM, FM, SSB);

(b) Transmitting CW (CW); Note: CW in this context means CW only; any other digital modes such as Packet, RTTY, AMTOR, PSK31 etc are excluded from the contest.

(c) Transmitting Open (a) and (b);

(d) Receiving (a), (b) or (c).

3. All amateurs in Australia, Papua New Guinea and New Zealand may enter the contest, whether their stations are fixed, portable or mobile.
4. Cross-band and/or cross-mode contacts are not permitted.
5. Call "CQ RD", "CQ CONTEST" or "CQ TEST".

6a. On bands up to 30 MHz stations may be contacted at intervals of not less than four hours since the previous contact on that band and mode.

6b. No points will be awarded for contacts between stations in the same call area on HF, save on the 160 metre and the 10 metre bands, on which entrants may work stations in the same call area.

6c. On the 10 metre band, contacts may also be made using the FM mode, using simplex only, on frequencies above 29.0 MHz only. This will be considered a different mode for scoring purposes, so an SSB or CW contact could immediately be made with the same station below 29.0MHz for an additional score.

7a. On 50 MHz and above, the same station in any call area may be worked using any of the modes listed at intervals of not less than two hours since the previous contact on that band and mode.

7b. For the VHF category, up to three contacts may be made with the same station consecutively on each band, but must be made using the different allowable modes of CW, SSB and FM. However, the different modes must be within the frequency ranges stated in the text descriptions of the 2005 Call book as 'mode' only. For example, on the two metre band, RD Contest CW contacts may only be made in the range 144.050 to 144.100 MHz. SSB contacts are restricted to 144.100 to 144.400, while FM contacts must be above 146.000 MHz. The national simplex calling channels (146.500 MHz on the two metre band), and the frequencies either side thereof, excluding recognised repeater frequencies, are the frequencies of choice. When changing modes, entrants must also change frequency.

7c. All scores obtained between the entrant's local time hours of 0100 and 0600 are doubled. If working into an area where the time is outside those hours, the score is doubled only for the station whose local time is 0100 to 0600 hours.

8a. Both single and multi-operator entries are permitted. To be eligible as a single operator, one person must perform all operating and logging activities without assistance other than computer logging, using his or her own callsign. More than one person can use the same station and remain a single operator providing that each uses his or her own callsign, submits a separate log under that callsign and does not receive operating or logging assistance in any way other than computer logging during the contest.

8b. Holders of more than one licence or callsign may submit a separate entry for each callsign held.

9a. Multi-operator stations are only allowed one transmitter per band/mode at any one time. Simultaneous transmissions on different bands are permitted. Simultaneous transmissions on the same band but different modes are permitted.

9b. Automated operation is not permitted. The operator must have physical control of the station for each contact. CW and voice keyers are permitted, as is the use of computers for logging.

10. For a contact to be valid, numbers must be exchanged between stations making the contact. Exchange RS for phone and RST for CW, followed by three figures commencing at 001 and incrementing by one for each successive contact.

11. Contacts via repeater or relay are not permitted for scoring purposes. Contacts may be arranged through a repeater, although contact numbers may not be aired there. Operation on repeater frequencies in simplex is not permitted. Satellite operation is not permitted for this contest.

12a. Score: on 160 metres two points per completed valid contact; on 23 cm or higher bands two points per completed valid contact; on all other bands one point; on CW irrespective of band, double points.

12b. All HF contacts whose total distance between stations is in excess of 1000 km and all VHF contacts whose total distance between stations is in excess of 100 km, will receive double points. In all cases, distances may be estimated. The Contest Manager's calculation of distance shall be the final arbiter.

12c. Contacts with any station within VK8, VK9 and VK zero will also earn double points for both sides of each contact.

13. Logs should be in the format shown below and accompanied by a Summary Sheet showing callsign; name; address; category; section; for multi-operator stations a list of the operators; total score; declaration: I hereby certify that I have operated in accordance with the rules and spirit of the contest; signed (postal mail only); date.

14. Entrants operating on both HF and VHF are required to submit separate logs and summary sheets for both categories.

15. VK entrants temporarily operating outside their allocated call area, including those outside continental Australia as defined for DXCC, can elect to have their points credited to their home Division by making a statement to that effect on their summary sheet(s).

16. Logs can be submitted by electronic mail or postal mail. By mail, send logs and summary sheets to: RD Contest Manager, Chris Edmondson, VK4AA, PO Box 123, Eagle Heights, QLD 4271. By E-mail, PLAIN TEXT logs only may be sent to vk4aa@wia.org.au. In either case, logs must be received by last mail on Friday 16 September, 2005. Late entries will not be eligible.

17. Certificates will be awarded to the leading entrants in each section, both single and multi-operator; in each State; P2 and ZL. Entrants must make at least 10 contacts to be eligible for awards, unless otherwise decided by the Contest Manager.

18. Any station observed as departing from the generally accepted codes of operating ethics may be disqualified.

Determination of Winning State or Territory

The scoring system used until 2004, incorporating an "improvement factor", has been abandoned. For 2005 a new scoring system applies as follows:

Scoring will be achieved by taking the total number of logs for each State or Territory, divided by the total number of licences issued in that State or Territory (excluding beacons and repeaters) as published in the WIA Callbook for that year, and multiplying by the total score for that State or Territory. Points can only be considered where a station has submitted a valid log.

Logs for VK5 and VK8 will from 2005 be considered as coming from different states.

Unless otherwise elected by the entrant concerned, the scores of VK0 stations will be credited to VK7 and the scores of VK9 to the mainland call area which is geographically closest. Scores of P2, ZL and SWL stations will not be included in these calculations.

Receiving Section Rules

1. This section is open to all SWLs in Australia, Papua New Guinea and New Zealand. No active transmitting station may enter this section.
2. Rules are the same as for the Transmitting Section, save for scoring, where double points may be claimed where one of the received stations is in excess of 1000km from the receiving location on HF, or more than 100 km from the receiving location on VHF.
3. In all cases, distances may be estimated. The Contest Manager's calculation of distance shall be the final arbiter.
3. Only completed contacts may be logged, ie it is not permissible to log a station calling CQ.

Layout of logs

The log should be in the format shown below, whether submitted electronically or via the postal mail.

ar

Sample Summary Sheet:

Remembrance Day Contest 2005

Callsign:	VK1xxx
Name:	Operator's full name
Address:	Physical address of contest station
Category:	HF or VHF / Single or Multiple Operator
Section:	Transmitting Phone, CW or Open
Total Score:	number of points claimed
Declaration:	I hereby certify that I have operated in accordance with the rules and spirit of the Contest.
Signed:	Your signature if log is submitted via mail.
Date:	20 August 2005

Sample Transmitting Log

Remembrance Day Contest 2005

Callsign: VK1xxx
Category: HF or VHF / Single or Multiple Operator
Section: Transmitting Phone, CW or Open

Time (UTC)	Band	Mode	Call worked	Number Sent	Number Rcvd	Pts
0801	14	SSB	VK2QQ	58001	59002	1
0802	14	SSB	VK6LL	59002	59001	2
0806	14	SSB	VK5ANW	59003	59001	1
0808	14	SSB	ZL2AGQ	56004	57004	2
0811	14	SSB	VK4XX	59005	59008	1

Example Receiving Log

Name/SWL Nr:
Category: HF
Section: Receiving Phone

Time (UTC)	Band	Mode	Call 1st op	Call 2nd op	Number 1st op	Number 2nd op	Pts
0801	14	SSB	VK1XXX	VK2QQ	58001	59002	1
0802	14	SSB	VK1XXX	VK6LL	59002	59001	2
0806	14	SSB	VK5ANW	VK1XXX	59001	59003	1
0809	14	SSB	VK7AL	VK2PS	59007	58010	1

2005 Wadda Cup Contest

The Central Highlands Amateur Radio Club of Tasmania (CHARCT) will hold the 2004 80 m Dash for the Wadda Cup on Saturday, 24 September 2005.

With the popularity of the Wadda Cup Contest growing each year, 2005 should be an exciting event. If you have not had a go at the contest, then I encourage you to join in the fun of the 2005 dash. Unique to this contest is the on air call back that is held at the conclusion of the event. The atmosphere builds as the score count down nears the eventual winner.

As in past years, the Contest Manager takes on board any worthwhile suggestions that could help improve the contest for the following year. Past participants will know that the Wadda Cup Contest is ever evolving and this year is no different. The date has been moved from October to September. This is to alleviate the problems of time zone differences due to daylight saving time. It was also thought that by holding the event a little earlier, we may not have the static crashes to deal with. The time format may now be in UTC or local time.

Contest bonus

The contest also offers amateurs the opportunity of accumulating contacts for two Tasmanian awards. The CHARCT Tassie Trout Award is available to any amateur that makes contact with 14 CHARCT members. Full details, including the current membership list, are available on the club's website www.vk2ce.com/vk7cht

Also, the Tasmanian Division of the WIA has the Tasmanian Devil Award. Contact with 50 VK7 amateurs is the only requirement on HF. More details are available on the VK7 division website www.tased.edu.au/tasonline/vk7wia

Contest aims

- Encourage on air activity in a short, friendly contest.
- Provide amateurs with the opportunity of accumulating contacts for the Tassie Trout Award and the Tasmanian Devil Award.
- Encourage entry by first time contesters.
- Promote on air activity of VK7 amateurs.
- Encourage SWL participation, especially SWL's that have not entered a contest.

The complete Wadda Cup rules are as follows -

Contest date and time

The contest will be held on Saturday, 24 September 2005. The contest will be 60 minutes duration. The start time is 1030 UTC (8.30pm EST) until 1130 UTC (9.30pm EST).

Pre-contest announcements

The contest on-air coordinator will be VK3EK, Rob Ashlin, the winner of the 2004 event. Rob will operate as VK7CHT/3 (CHARCT club callsign) during the contest. Contact with VK7CHT/3 will earn 2 bonus points. VK7CHT/3 will not be eligible for the Wadda Cup or any contest award certificates.

All contestants are asked to listen on 3.585 MHz (+/-), 15 minutes prior to the start of the contest. CHARCT President Bob Geeves, VK7KZ, will give a short address and officially launch the 2005 80 m Dash for the Wadda Cup. VK7CHT/3 will give an UTC time check, on this frequency, 2 minutes before the start time.

General rules

1. The contest is open to all VK amateurs and SWLs.
2. A station may only be worked once during the contest.
3. The exchange will consist of your call sign and your Christian name. Sequential numbers DO NOT need to be exchanged. RS exchange is not required.
4. The contest is phone only, using LSB on the 80 m band. Frequencies to be used are from 3.540 MHz to 3.625 MHz.
5. Maximum power is 100 watts.
6. Entry categories -

   Category a) Single operator entries only. No multi-operator entries are allowed.

   Category b) Short wave listeners (SWL).
7. The winner of the 2005 Wadda Cup will be the on air contest coordinator for the 2006 event. This is not a great chore. The on air manager only needs to operate the CHARCT club callsign (VK7CHT/P) and conduct the contest call back at the end of the contest. If, for any reason, the winner is unable to operate as the on air contest coordinator for the following year, CHARCT will take over the role for that year.

Scoring

Category a)

i. Contact with any VK amateur scores 1 point.

ii. Contact with VK7CHT/5 scores 1 contact point plus 2 bonus points = 3 points.

Category b)

i. All recorded contacts score 1 point

ii. VK7CHT/5 may be recorded more that once, however, the 2 bonus points may only be counted once.

The contact and move rule

1. After calling CQ contest and establishing a contact, the calling station must move its calling frequency by at least 5 kHz.
2. A station answering a calling station may make one call on the same frequency and exchange names with another station. The calling station must then move its calling frequency by at least 5 kHz.

Example - VK7VH calls CQ contest on 3.560 MHz. VK7KZ answers the call and exchanges names with VK7VH. When the contact is completed, VK7VH must move frequency by at least 5kHz. VK7KZ may then call CQ contest on 3.560 MHz. VK2CE answers VK7KZ and exchanges names. VK7KZ must move at least 5 kHz etc etc.

Logs

1. All participants must keep a separate contest log sheet. Use 3 headings - UTC time, Station worked, Name (Christian name of the station worked).
2. SWLs should record UTC time, the call sign of both stations and the name sent by each station.
3. Retain your log for checking. During the contest call back, the on air contest coordinator will advise you if your log is required to be sent to the contest manager. If, for any reason, you are not able to participate in the call back, you must send your log to the contest manager for inclusion in the contest results.
4. It is a pre-requisite that the contest winner, 2nd place contestant(s), 3rd place contestant(s), as per the call back, and all SWLs must send their log no later than 24 October 2005.

Send postal entries to -

The 2005 Wadda Cup Contest Manager
2/6 Lissadell Court
Newtown
Tasmania 7008
Send e-mail entries to –
vk7vh@hotmail.com

E-mail entries will be accepted in txt, word 6, excel 6-format or text output from any logging program. Attach the file to the e-mail. Please do not put your log into the body of the e-mail text. Put your call sign 2004 Wadda Cup Log into the subject heading, please, please ensure that this happens. Can you imagine the confusion when the contest manager receives logs without call signs in the file?

Logs must be legible and show the details required in Log rule1 (Log rule 2 for SWL). Attach a summary sheet or make a note in the main body of the log, showing the entrants callsign, name, address and claimed score. If your log is not received by the due date, you may be excluded from the contest results. You will be advised during the call back if your log will be required as a check log.

The winner

All contest participants are asked to listen for VK7CHT/3 on 3.585 MHz (+/-) immediately after the conclusion of the contest. Add up the number of contacts that you made, during the contest, and if you worked VK7CHT/3 add 2 bonus points to your final score. Follow the on air roll call to find out the provisional winner of the Wadda Cup and other contest award certificate winners.

1. The winner will be the entrant with the highest score.
2. Should there be more than one entrant with the highest score, an on air count back will be conducted by the on air contest coordinator. The count back will be based on the number of contacts made during specific time blocks. Although the count back procedure will be decided prior to the contest, details will only be revealed during the count back.
3. The provisional winner, 2nd place contestant(s) and 3rd place contestant(s) will be declared official when logs have been received and checked by the contest manager.
4. The contest manager's decision will be final.

The awards

1. The winner will be awarded the Wadda Cup, suitably engraved, for a period of 12 months. The Wadda Cup is a classic silver cup and has become known as the "Old Mug". The winner will also receive a replica of the Wadda Cup and the first place award certificate.
2. All 2nd place contestant(s) and 3rd place contestant(s) will receive an award certificate.
3. The highest SWL score will receive a special contest award certificate.

Results

When the contest manager has verified all logs, the results will be published on the CHARCT website. Results will also appear in Amateur Radio magazine.

If you need any further information about the Wadda Cup Contest, the Central Highlands Amateur Radio Club of Tasmania (the contest organisers) hold an on air quiz night every Thursday at 8.30 pm local time. Tune around 3.585 MHz and give them a shout. You would be most welcome to join in the quiz, which is a lot of fun and usually lasts for 30 – 40 minutes. Alternatively, the Tasmanian Devil Net is on the same evening, ably run by Dale (VK3YR), at 8.00pm. Information is also available on this net.

We encourage you to have a go at the 2005 80 m Dash for the Wadda Cup. Have fun during the contest and don't forget to join in the roll call at the end of the contest.

Goodluck and happy contesting

Vincs Henderson, VK7VH
2005 Wadda Cup Contest Manager

ar

Silent Key

We are sad to announce

Geoff Taylor VK5TY,

OM of Christine VK5CTY, ALARA, died peacefully while on holiday in the UK.

VHF/UHF - an expanding world

David Smith VK3HZ - vk3hz@wia.org.au
Leigh Rainbird VK2KRR - vk2krr@wia.org.au

Weak signal

David Smith VK3HZ

During the month of May, some heightened solar activity resulted in auroral openings in the south of the country.

Thanks to Tony VK3CAT in Melbourne for the following report:

"Sunday 15th June from 0700 Z 0817 Z. The Space Weather forecast was for possible auroras following a CME event. At 5 pm local time (0700 Z), the Wagga Wagga TV video carrier on 46.240 MHz was received with heavy AU distortion. For the first time ZL TV video on 45.250 MHz was also received with AU distortion and ZL TV audio on 50.750 MHz was received with severe distortion. As I have never logged ZL TV in an AU event, it may be possible that there were also some local mid-year Es around as well providing the link.

The first station worked was Karl VK2GKA on 144.100 CW RST 55A. Ron VK2BHO was worked on 50.120 CW RST 52A. Other stations worked on six metres were Norm VK3DUT at Lakes Entrance and Kevin VK3WN at Ballarat.

Further 2 metre contacts were on SSB with Peter VK5ZLX, Colin VK5DK, Karl VK2GKA and a CW / SSB contact with Trevor VK5NC. Towards the end of my operating time - had to cook the BBQ - Doppler shift on 2 metres was close to 2 kHz whilst the maximum Doppler shift on 6 metres was several hundred Hz.

It was nice to hear some CW operation on both 2 & 6 metres. CW operation was much easier and quicker than the SSB mode with operating speed only at about 15 WPM."

Ed VK3BG from KooNooMoo on the bank of the Murray River reports:

"Between 0712 Z and 0839 Z, I worked VK3KAI, VK5ZLX, VK3ZYC, VK1ZQR, VK3KEG, VK3DUT, VK3BBB, VK5NC and VK3ZQB. All the signals were around S9 or better, readability 4, peaking 150 true from here. There were other VK2, 3, & 5 stations also that I did not work, as well as some CW.

It affected HF as well, signals on 40 m were very fluttery around 0730 Z when I worked my mate Ron, VK4BRG/P west of Charlieville, but nothing was heard from him on 6 m at that time.

The Aurora reappeared around 0700 Z on Mon but no one worked from here."

Peter VK3KAI in Churchill reports working VK3ZQB, VK3KEG, VK3BG, VK5ZLX, VK2GKA and VK5NC. Also heard were VK3BJM and VK3ZYC. Surprisingly Jim VK3ZYC, a relative neighbour, was not audible direct, only via Au - too much dirt in the way.

Trevor VK5NC reports going portable to the local hilltop in Mt Gambier. There he worked VK5ZLX, VK2GKA, VK3ZYC, VK3DUT, VK3KAI, VK3CAT, VK3BG and VK3BBB. Activity was a bit scarce. Most signals were very strong and some a little difficult to copy.

Other activity for the month included some tropo enhancement from VK3 to VK5, thanks to the good weather and a number of slow-moving high pressure cells passing across the area. A small group of operators seem to be consistently present at the VK5 end of the contacts. Brian VK5UBC in Gawler, Garry VK5ZK in Goolwa, John VK5PO in Eden Valley and Peter VK5ZLX in Angaston all put good signals into Melbourne and further afield. Signals should improve following work currently in progress on antenna systems. We managed to capture a photo of Peter, John and Brian, operating from an impressive location in the Barossa Valley area.

Peter VK5ZLX, John VK5PO and Brian VK5UBC

Aircraft enhancement

Several years ago, Barry VK3BJM moved from his Melbourne location to a country site near Kyneton. He has been re-building his station and sent the following report on his findings working the morning aircraft enhancement net from his new location.

" A couple of interesting AE contacts in the last couple of months from near Kyneton.

Way back on February 26th, at 2126 Z, I worked Kerry VK2BXT (Campden) with 41 - 52 reports exchanged. On April 9th, at 2256 Z, I worked Bill VK2ZZF (Cherrybrook - near Pennant Hills in Sydney) with 51 - 55 reports exchanged. On May 6th, at 2225 Z, I (just) managed to work John VK2TK (Wentworth Falls) 51 - 51 reports exchanged. On June 3rd at 2256 Z I worked Brian VK2BX (Gerroa - on the NSW coast between Kiama and Nowra) with 51 - 53 reports exchanged. Very pleased to have worked Brian, considering his location cannot be ideal for shooting in my direction. I've worked Guy VK2KU (Marulan) at times of 2157 Z and 2149 Z (during Daylight Saving) this year.

I work, reasonably regularly, Karl VK2GKA (Mittagong) and I thought I'd look back through the log since I fired up here near Kyneton in October 2003. I found I have worked Karl 41 times over the 20 months, and 11 of those contacts have been made in the 10-minute window between 2250 Z and 2300 Z (2150 and 2200 Z during Daylight Saving). 10 contacts have been completed between 2235 and 2245, and 9 contacts between 2210 and 2220. Four contacts were made in the 4-minute window either side of 2225 Z.

It's fairly obvious that there are a couple of hotspots for AE between Sydney and Kyneton, and the ten-minute window between 2250 and 2300 Z seems to be the pick of them. My belief is that it is aircraft flying between Melbourne and Brisbane that are best positioned to provide this path, and slight adjustments to the time window would provide similar contacts for other stations in Central Victoria with a reasonable operating location and take-off to the NE. I'm not convinced that I get much assistance from the Melbourne-to-Sydney aircraft, when working into the Sydney area - though they provide plenty of assistance when working the area between Canberra and Nimmitabel.

I haven't gone through the many contacts I had with Gordon VK2ZAB before he closed operations, but I think I should, to help clarify the pattern."

GippsTech 2005

Hopefully this magazine will be out before the weekend of July 9th and 10th when GippsTech 2005 is due to be held at Churchill in southeast Victoria. GippsTech is an event not to be missed by the serious weak signal operator.

So far, the list of presentations on offer include:

- Calculating Troposcatter Losses - Rex VK7MO
- Lightning - Effects of a Near Strike - Guy VK2KU
- More Ideas and Measurements of Elevated Ducts - Andrew VK3KAQ
- Noise figure measurements over the years - Chris VK5MC
- High stability crystal ovens based on zero temperature gradient - Rex VK7MO
- Modification of the FT847 to eliminate frequency drift - Joe VK7JG
- Small Station EME - David VK3HZ.
- The new modulation scheme: COFDM, and it's application in Digital TV, Digital Radio Broadcasting, and digital voice on amateur radio - Glen VK2JPR
- A 3-phase noise blanker - Glen VK2JPR
- Simple VHF S-Meter Calibrator - Neil VK2EI
- Frequency Measurement using Modern Transceivers - Neil VK2EI
- An outline of recent projects using PICs: repeater controller, Wx station data converter & dish direction controller - John VK5DJ.
- Recent advances in optical communications. Chris Long
- Myth Busters regarding High power permits. Doug VK3UM

For more information, steer your browser to http://www.qsl.net/vk3bez/

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

The magic band – 6 m DX

Brian Cleland VK5UBC

The month of May produced many good sporadic E openings. There were several openings down the eastern coast and from VK5 to VK4 & 2 as well as openings from ZL to VK2, 3 & 4.

From VK5 openings occurred on the following days during May:

2nd to VK4
6th to VK6
10th to central coast VK2
12th to southern VK4
13th to southern VK4 and VK7
21st from far north Queensland to south of Sydney
22nd to northern VK4,
24th to VK8 (Alice Springs beacon)
29th to north coast VK2, southern VK4 and VK8 (Alice Springs beacon)

The weekend of the 21st/22nd May was exceptional with the band being open for several hours on both days. Brian VK5UBC worked 21 different stations from far north Queensland to south of Sydney on these days. As well as these contacts the FK8 beacon was up to S9 on the 21st with FK8HA heard calling CQ and on the 22nd the C21 beacon from Nauru was up to S3 for over an hour.

Norm VK3DUT also reports good conditions on the 22nd May into VK4 as well as both the FK8 & C21 beacons being audible. On the same day Norm also worked Rod ZL3NW. During an Aurora opening on the 15th May Norm reports hearing the ZL3 beacon but despite many calls did not hear any ZL's. The VK7RST beacon was heard in Adelaide during the same opening.

The 14th May also produced an excellent opening from VK5 to JA. Col VK5RO and Steve VK5ZBK worked several JA stations with signals up to S9 over a 2-hour period. The logger indicates that the JA's also worked into VK2 on the same day

John VK4FNQ from Charters Towers reports working many VK2, 3 & 5 stations on the 21st, 22nd & 23rd May as well as Rod ZL3NW and Murray ZL3MH. John also reports working JA's on the 14th, 15th & 17th May along with the South Korean stations HL3IUA & DS1GQS.

Congratulations go to Joe VK7JG at Launceston who completed a 6 m EME contact with ON4IQ Belgium over a distance of 17,011 km, which is believed to be an Australian record.

If you want to know what's happening on 6 m, try accessing this site http://www.qsl.net/vk4cp/clusters.htm which will allow you to view 3 clusters/loggers.

Please remember to send any 6 m DX information to Brian VK5UBC at bcleland@picknowl.com.au. I can only report what I know.

Spotlight on SWLing

Robin Harwood VK7RH

Propagation is extremely poor lately and there has not much about. I notice that in Europe, complaints have been raised about the width of DRM transmissions, particularly within the 49 metre broadcasting allocation.

Aim to commence DRM in Pacific

So far, no DRM experimental transmissions have been made in Australia yet Radio New Zealand did briefly demonstrate this digital mode at a recent symposium in Auckland. Their aim is to eventually commence broadcasts to the Pacific for rebroadcast by local stations. The prohibitive cost of current models of DRM would be beyond the reach of the many in the region. Many in the Pacific Islands depend on this station for news and weather and mainly use portable receivers and I expect that analogue transmissions will continue for some time.

New private SW station

A new Christian broadcaster recently commenced broadcasting from Port Moresby on shortwave. It is Radio Wantok and has been heard on 7125 from 0800 till sign-off around 1200. I believe it has been heard in British Columbia and Oregon but all I am hearing is a carrier with the modulation being low. This is not surprising, as I believe it is only rated at a kilowatt and is using a radiation pattern to emphasise skywave. This is the second private shortwave station in PNG after a Catholic station commenced last year in the 90 metre tropical allocation. Naturally the main station from Port Moresby on 4890 has been heard for decades as their sender is rated at 100 kW.

New toy brings end to birdies

I now have a brand-new Athlon 64, replacing my ancient Pentium, which finally died. Fortunately I was able to retrieve all of my important data and transfer this over. I also was pleasantly surprised to note a big drop in the presence of birdies and buzzes from this new unit. Some still remain but nowhere near what I had with the Pentium. I also was contemplating upgrading to broadband but hit a brick wall. My existing ISP said no and I could not get an answer from the monopoly because I got fed up being placed on hold or trying to understand a call centre operator outside of Australia. One wonders if customer service is a thing of the past.

Croatia in English

I did hear the Croatian Radio in English on 9925 at 2200 It is only on weekdays and is beamed to South America and is followed by Spanish at 2130. I believe that the transmission for Australia is on between 0500 and 0700 on 13820 via senders in Germany. The majority of the program is in Croatian with an occasional 5 minute English news bulletin.

Don't forget you can email me your comments to vk7rh@wia.org.au.

ar

VHF/UHF - an expanding world *continued*

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

Not a great deal to report on for the month of May. From about the first week into May I began dismantling my 2 & 70 FM arrays for maintenance, so I have not been active on the bands to note down any conditions or contacts worthy of mention, so am relying on other input.

First duct opening of the month occurred in the evening of 1/5 and morning of 2/5. After 7.30 PM I found the Adelaide Crafers repeater 147.000 at 764 km and worked Mark VK5AVQ and Greg VK5THA.

An interesting twist after 11 PM, rarely heard here, the Broken Hill repeater on 147.000 was coming through at a good 5/8 signal at 638 km. I was lucky to catch up with Paul VK2YVG from Broken Hill on their repeater.

Around midnight and back into the Crafers repeater, Rob VK5MM was about, and some rare DX from Kangaroo Island with Bill VK5ACY putting in a good signal.

Thanks to John VK3HJW for the following, which occurred on the 6/5. John was able to work Brian VK5UBC at Gawler via the Mt Macedon repeater 147.250. John also mentions hearing John VK5PO at Eden Valley also on Mt Macedon. Andrew VK3FIX was heard working into the Mt Barrow repeater 147.000, VK7RAA, and was speaking with Karl VK7HDX.

For the last 20 or so years Michael VK2KBC has been actively mobile whilst driving his semi trailer around Sydney . In the early days with the call of VK2NBB he worked DX daily on 10 and 15 metres and got to be well known in the US .

Michael had a list of stations that were about on the Heathcote Repeater 15 yrs ago and it totalled about 80 operators . I put this down to Michael acting as a beacon, always being available for a chat throughout the working day.

Later on when IRLP became active on the Blue Mtns repeater he once again renewed his DX operations . Stations from the US would call him for a chat just as they used to do on HF years ago .

Michael has decided to hang up his boots and concentrate on his retirement and a move to the North Coast . I'm sure there are lots of people like myself that wish him well and hope to catch up with him again on the air .

Chuck VK2SS

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au.

ar

How to write for Amateur Radio magazine

Bill Roper VK3BR

***Amateur Radio* is the membership journal of the Wireless Institute of Australia (WIA). It is a forum for members to publish their amateur radio experiences, whether it is their latest technical achievement, a new antenna or an operating experience. The editors do not rewrite articles to any corporate style, but try to retain the original style of the author while correcting, where necessary, spelling, grammar, punctuation and the accuracy of what is written.**

It's easy to write for *Amateur Radio*. Hundreds of amateurs have already done it. Few of them are professional writers. All get a lot of satisfaction out of hearing their fellow amateurs say they enjoyed reading their article in the latest issue of the WIA journal.

Just about anybody can write. Some can turn an elegant phrase, while others just explain what they have in mind and keep right to the point. Practice develops skill in writing, just like anything else you do. The more you write, the easier it gets and the better it is.

The subject

Many amateurs love reading about simple equipment, and antenna construction and design articles. While most of us will not actually build the project we often follow the construction in our minds and enjoy reading about it.

It pays to be extremely careful in checking your article, particularly circuit diagrams, for any errors, or the mail will pour in.

If you are experimenting in a new field, you may want to write about it and let others know what you are doing and discovering. Bear in mind, however, that you are writing for a wide range of amateurs, from beginners to experts. Gear your article, if possible, to the "entry level" amateur. After all, this is an amateur radio publication, not an electronic engineering publication.

While the emphasis in Amateur Radio magazine is for technical articles, readers also like to read about any other area of amateur radio interest – a visit to a particularly interesting DX location, or perhaps a local event of significant interest to radio amateurs. Most amateurs have at least one good story in them.

The plan

Before you start to write the article, outline what you want to say. Remember the old rule: Tell them what you are going to tell them; tell them; then tell them what you've told them. Or, in more formal language, introduction, body, summary.

Follow this format for construction articles: introduction, theory, construction, alignment and adjustment, and summary. The title and opening paragraph are particularly important, as are diagrams and photographs. You win or lose most readers right at the beginning.

When writing, remember that *Amateur Radio* is an informal, hobby magazine and that you are writing for friends. Don't be a stuffed shirt. Go lightly on impersonal third-person terms, such as "the author". It's in order, however, to occasionally use the first person "I".

Also use direct sentences whenever possible. They deliver your point more forcefully. "I fastened the nut" is better than "the nut was fastened". Write naturally, in short simple sentences, starting a new paragraph with each new thought. Avoid unnecessary abbreviations. Use sub-headings as signposts for the readers.

Misspelling is easily avoided. Most of you have word processors with spell checkers, and hard copy dictionaries are cheap. Look it up!

Minimise maths. It's often not necessary in *Amateur Radio* articles, and it scares many readers. While most readers can use high school algebra and trigonometry, they don't want to. They prefer practical projects, designed and ready to build. Graphs are next best. Maths is last. Even engineers prefer predesigned circuits, if only as a starting point for their work. Use maths only where it is vital. If a mathematical derivation is necessary, show only the steps which introduce fresh logic. Steps of a purely mathematical manipulation nature should not be shown.

Avoid footnotes. References in the text are easier to read.

Make sure you give credit when you borrow an idea or material from someone else. Quote the publication name and issue from which the information was gleaned if it has been previously published. This is important both ethically and legally.

Manuscript

Most authors use computers these days to write their articles and submit their manuscripts as an email attachment. However, you can submit your manuscript by post on a disk or as typewritten hard copy. We prefer not to receive handwritten manuscripts, but will not reject an article because it is handwritten, provided we can read what you have written.

The *Amateur Radio* editors work in IBM format Microsoft Word and do not accept MAC format files. However, we can read other popular word-processing formats as well as Word. If in doubt, submit your electronic copy as an .RTF or .TXT file as well as in your word-processor's native format.

When preparing your electronic manuscript for emailing (or for printing and submitting as hard copy), please observe the following:

- *Do not attempt to format the document to look like a magazine page.*
- Indentations should be made with the TAB key and not the space bar.
- Do not use the ENTER key (line returns) at the end of each line, only at the end of each paragraph.

- Images, illustrations, diagrams, or lengthy lists or tables of figures can be inserted within the manuscript to indicate where they are relevant. However, you MUST also send them as separate files or sheets. Tables and lists are best made using the 'Insert Table' command, or creating them as a separate Excel .XLS file.
- Number all diagrams and photos and include explanatory captions at the foot of the article.
- Ensure your name, call sign, postal address, telephone number and e-mail address are included within the manuscript file.
- When submitting hard copy, use regular A4 typing paper and make sure the printer produces sharp, black text.
- If you must submit a hand written manuscript, perhaps block printing may be best.

Abbreviations and symbols

The editors of *Amateur Radio* magazine use the abbreviations as detailed in the Australian Government Publishing Service (AGPS) Style Manual, such as: Hz, kHz, MHz, GHz, µF, pF, mH, H, W, mW, µW, V, mV, kV, A, mA , µA, dB, km, Ω, kΩ, and MΩ. Do not use full stops or pluralise the abbreviations. Separate them from the number: 10 MHz, not 10MHz. Modes of emission, and acronyms in general, are capitalised: AM, FM, CW, SSB, RTTY, ATV, RF, IF, DC, AC, RMS, VFO, AGC, etc, with the exception of V dc, V ac. Though the text flow should be informal, keep away from 'hammy' abbreviations in your articles such as xtal, XYL, xmtr, xfmr, etc.

Greek letters such as µ and Ω can be created with most word processors. In Microsoft Word, use the 'Insert > Symbol' facility from the menu bar, select Font '(normal text)' and then scroll down until Subset shows you are in the 'Basic Greek' section.

Diagrams, illustrations and schematics

Put all drawings in separate files or on separate sheets of paper. Never put them in the text. If the standard of your drawing is not good enough to be published as is, we will redraw it for you. Be sure your sketches are complete, neat and readable. Put parts values on the schematic and include a separate parts list. Use terms R1 and C2, etc. Label the drawings numerically, for example Fig 1, Fig 2, etc. At the end of your article text, list the figures with a caption for each one.

The *Amateur Radio* draftsman uses TurboCAD for redrawing diagrams. However, if you are proficient in using other CAD programs, such as AutoCAD and Protel, please submit your drawing in your program's default format, as well as a .TIF or .WMF file if possible, and also send a flat (not folded) hard copy printout of the diagram.

Photographs

Good photographs can make all the difference in the appeal of an article. Photographs should be high contrast black and white photographs or colour prints with good contrast and bright colours. We are always in need of interesting photographs for the front cover.

If you send standard 10 x 15 cm size print photos through the post, please ensure they will not get bent. Also, do not write on the back of the photos; use a stick-on label. Label each photo clearly: "Photo 1", "Photo 2", etc. At the end of the article, list the photos along with captions describing each photo.

If you have a colour photograph that you want the editors to consider for the front cover of the magazine, take note of the vertical format requirement for the front cover, and send us a good quality print. Again, a standard 10 x 15 cm size print is satisfactory.

We can also accept digital images if the resolution is sufficient. Generally speaking, this means using at least a 2.0 megapixel (or greater) camera with the image resolution set at maximum. If you want your photo to be considered for the front cover of *Amateur Radio*, it should be taken with at least a 4.0 megapixel setting, although sometimes a 3.0 megapixel setting will suffice.

If you are going to scan a standard 10 x 15 cm size colour print in order to send us a digital file, use a 300 DPI setting. If you are going to scan a standard 10 x 15 cm size greyscale print, use 200 DPI.

If you are going to scan a black and white line drawing, please use 600 DPI.

High resolution .JPG, or standard or LZW compressed .TIF, files are preferred.

PC boards

If your project includes a PC board, send a positive of the board with your article, either hard copy or digital. Separately sketch out the component layout. If the positive is not the same size as the board, be sure to tell us.

Software

It is considered poor practice to reproduce pages of code listing in the magazine. A preferred approach is to publish a description of the logic and function of the program together with an address from which the code file can be obtained.

If your project includes a microprocessor or other device that functions with instructions that you have written, the object code must be made available at no cost to any reader who requests it.

Submission

You can submit your article in several ways. We prefer it electronically as an attachment to an email message. If the attachments total greater than 2 Mb, please send your submission in two or more emails.

If your submission is an article, either technical or general, please email to:

armag@optusnet.com.au

or post hard copy or computer disk to:

Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194.

If your are sending a column or a 'letter to the editor', please email to:

edarmag@chariot.net.au

or post hard copy or computer disk to:

Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112.

All copy, diagrams and photographs become the property of *Amateur Radio* unless specific arrangements are made otherwise. If you wish photos, diagrams or computer disks to be returned, please advise us and provide a SASE.

The editors will arrange publication of your article at the earliest opportunity. Be prepared to wait up to several months, however, before you see your work published. It can take that time to edit and prepare your submission for publication, and place it in a particular issue to ensure a balanced magazine. When possible, articles are published in the order in which they are received.

ar

HF Predictions

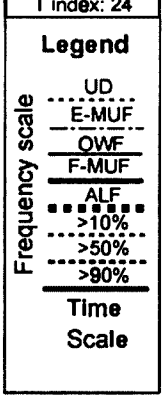
by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

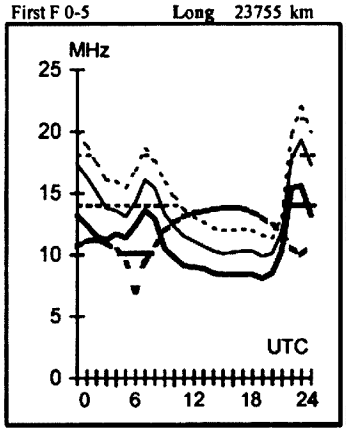
- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands In ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

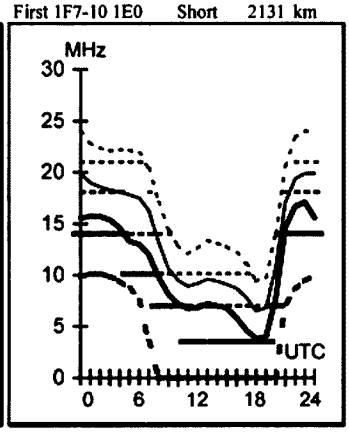
July 2005
T index: 24



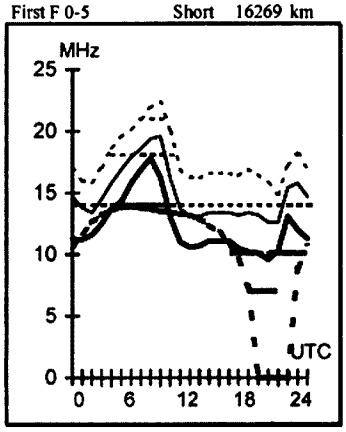
Adelaide-London 132
First F 0-5 Long 23755 km



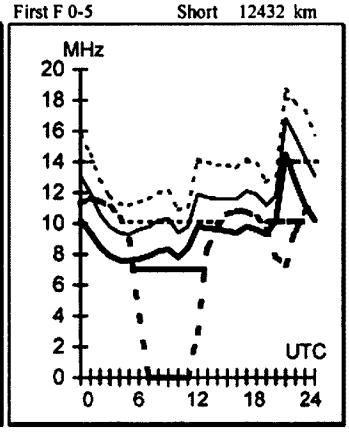
Brisbane-Honiara 21
First 1F7-10 1E0 Short 2131 km



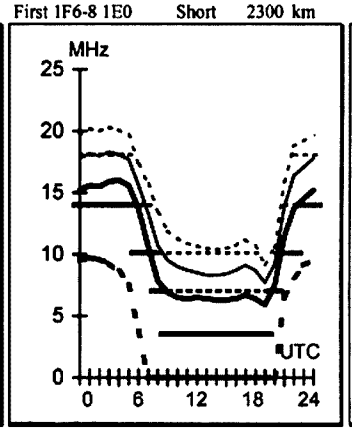
Adelaide-London 312
First F 0-5 Short 16269 km



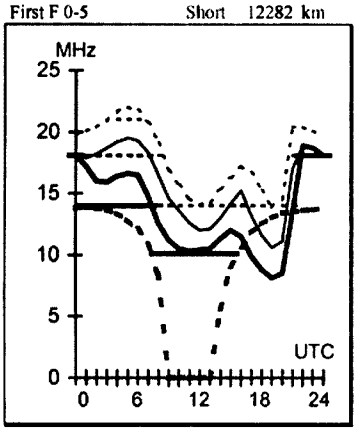
Brisbane-Montevideo 154
First F 0-5 Short 12432 km



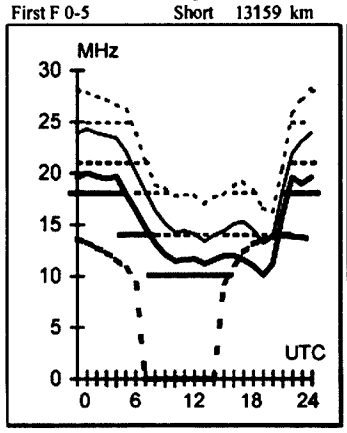
Canberra-Auckland 102
First 1F6-8 1E0 Short 2300 km



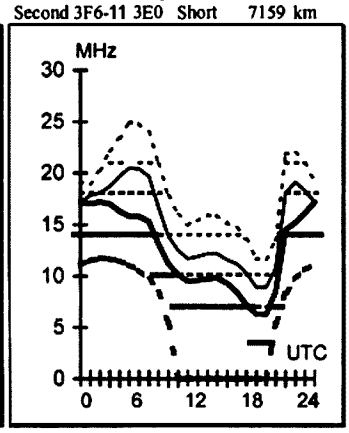
Darwin-Seattle 44
First F 0-5 Short 12282 km



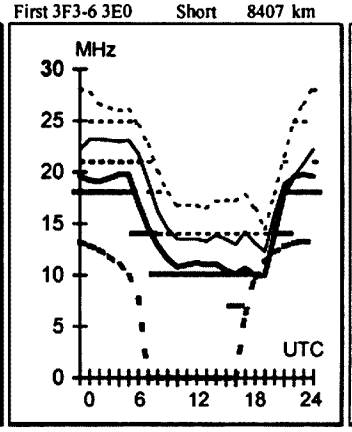
Adelaide-Los Angeles 66
First F 0-5 Short 13159 km



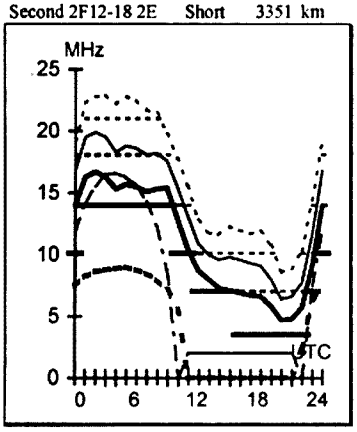
Brisbane-Tokyo 348
Second 3F6-11 3E0 Short 7159 km



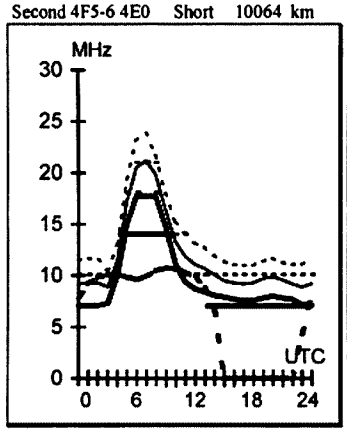
Canberra-Honolulu 50
First 3F3-6 3E0 Short 8407 km



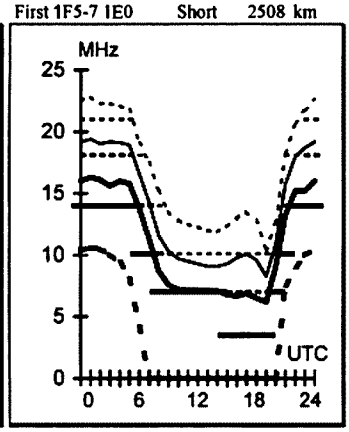
Darwin-Singapore 295
Second 2F12-18 2E Short 3351 km



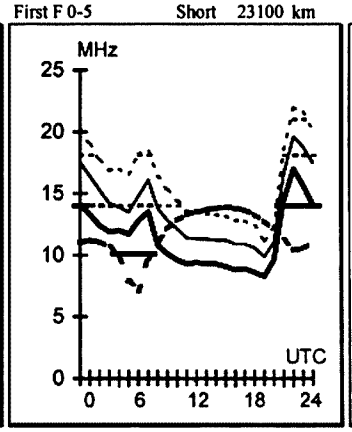
Adelaide-Pretoria 238
Second 4F5-6 4E0 Short 10064 km



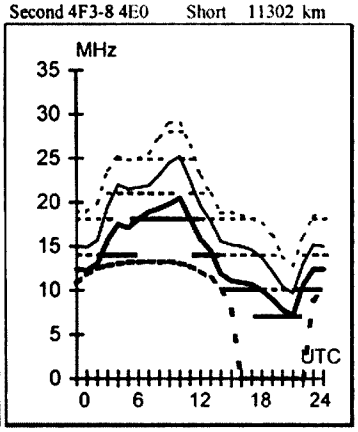
Brisbane-Wellington 133
First 1F5-7 1E0 Short 2508 km



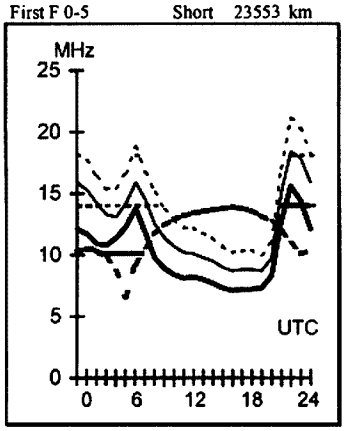
Canberra-Paris 130
First F 0-5 Short 23100 km



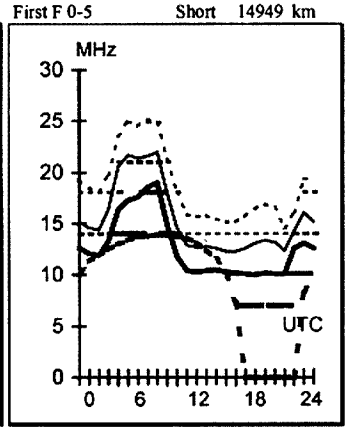
Darwin-Tel Aviv 301
Second 4F3-8 4E0 Short 11302 km



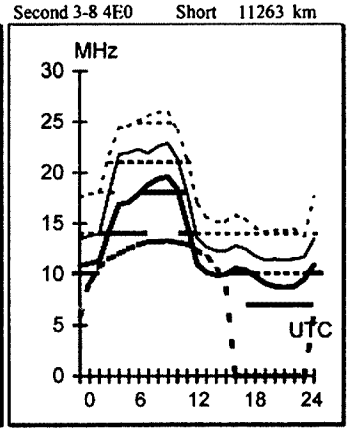
Hobart-Berlin 124
First F 0-5 Short 23553 km



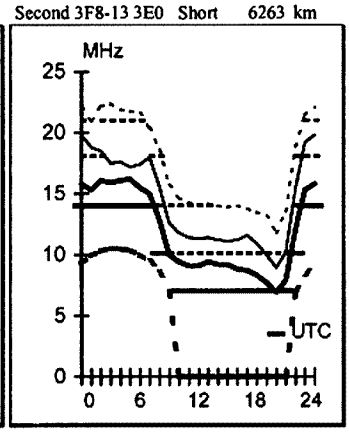
Melbourne-Athens 289
First F 0-5 Short 14949 km



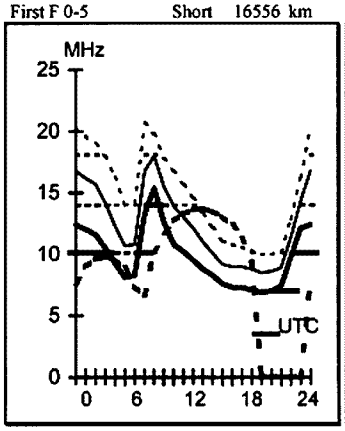
Perth-Cairo 298
Second 3-8 4E0 Short 11263 km



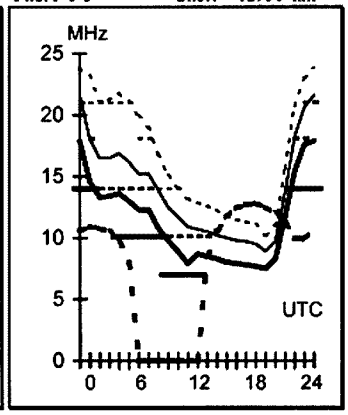
Sydney-Manila 324
Second 3F8-13 3E0 Short 6263 km



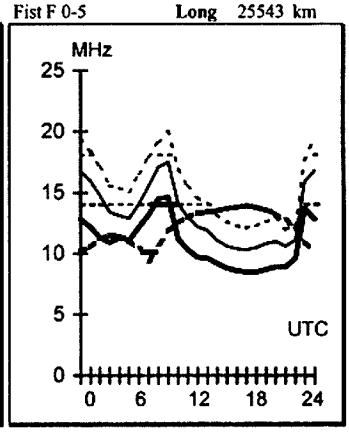
Hobart-Dakar 209
First F 0-5 Short 16556 km



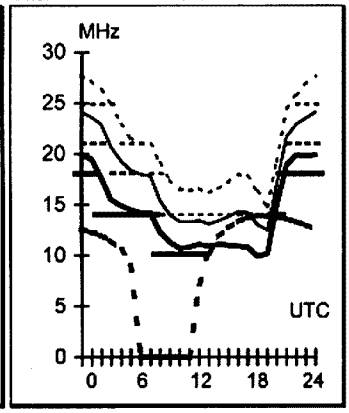
Melbourne-Lima 133
First F 0-5 Short 12950 km



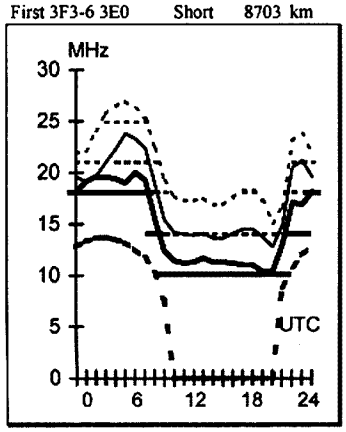
Perth-London 133
Fist F 0-5 Long 25543 km



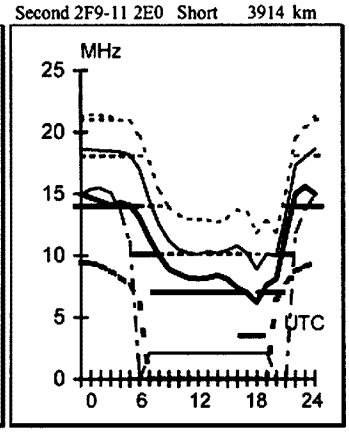
Sydney-Miami 86
First F 0-5 Short 15026 km



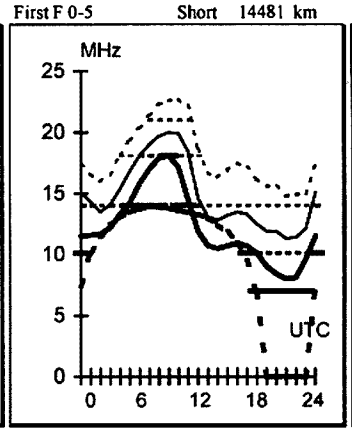
Hobart-Osaka 350
First 3F3-6 3E0 Short 8703 km



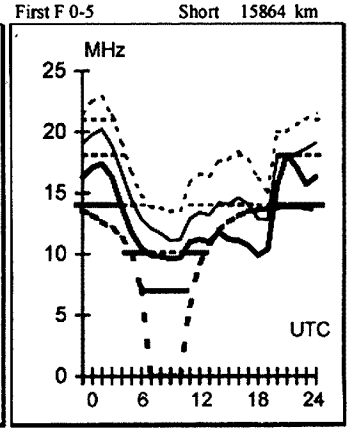
Melbourne-Suva 65
Second 2F9-11 2E0 Short 3914 km



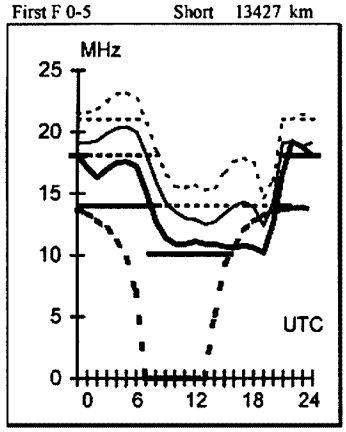
Perth-London 313
First F 0-5 Short 14481 km



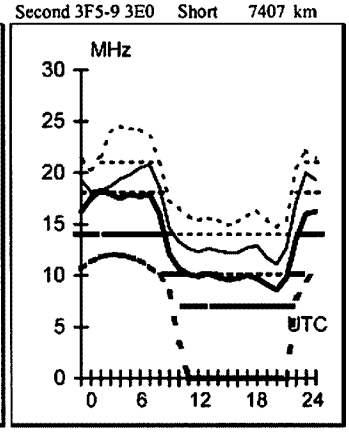
Sydney-Ottawa 58
First F 0-5 Short 15864 km



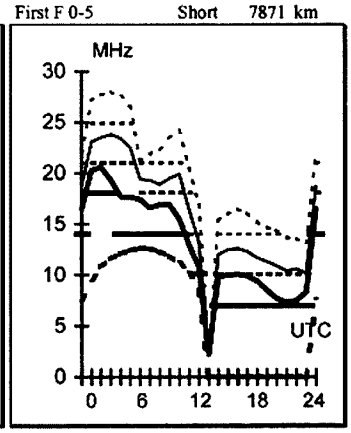
Hobart-Vancouver 49
First F 0-5 Short 13427 km



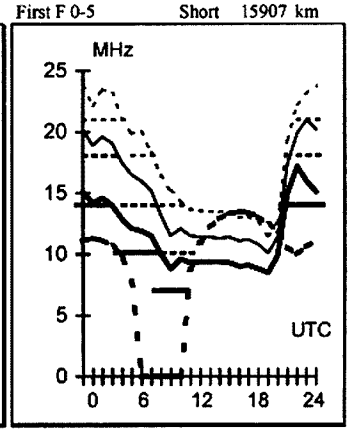
Melbourne-Taipei 337
Second 3F5-9 3E0 Short 7407 km



Perth-New Delhi 325
First F 0-5 Short 7871 km



Sydney-Surinam 133
First F 0-5 Short 15907 km



Hamads *classifieds* FREE

FOR SALE ACT

•***Shack clearance:*** Wilson 5 element tri band HF beam on a tilt-over tower with winch & heavy duty rotator. FT-101EE in above average condition. FT-780 12 watt UHFSSB, CW and FM, FTDX-401, PK-232 Packet, Amtor. RTTY keyboard CW etc with Sperry computer. All with manuals. SAE to Col VK1AU QTHR for 5 page list or call Col on 02 6281 3607

FOR SALE NSW

•***Deceased estate VK2FFF:*** Kenwood TS-940S s/n 8070307, with operating & service manuals, $400. Kenwood SWR/Power meter SW-200 s/n 6020037 with directional coupler & manuals $50. Jaycar lab oscilloscope KJ-7050 (old) $30. Mobile mount MMB-20 & relay box FRB-757 (for Yaesu FT-757), $30. Shure desk mic 444D & manual $50. AWA oscilloscope 5 in. type 1A 5650-31 & manual (large - good TX monitor) $50. MFJ 250 oil-filled dummy load, $30. BWD sin/square wave audio generator model 141, s/n 42498, $50. Tektronic oscilloscope, model TAS-220 (2 ch) with manual, offers? Home brew gear, all built to professions standards: 2 tone gen. 700 & 1900 Hz, $30. Noise bridge $30. HF linear amplifier 10-80 m (2 X 813s GG) (can make 1 kW), self contained, fully metered, very heavy, beautifully built, with 4 spare tubes, $400, buyer collect. ATU, large, SPC type, with roller inductor, $80. ATU for G5RV large, $50. ATU SPC type, switched inductor, $40. Power supply 1.5–13.8 V variable, regulated, metered, $20. Antennas: trapped vertical, 10-80 m, near new, (brand unknown), $100, buyer collect. Winch-up 2 section guyed aluminium mast approx 12 m high with Chirnside 3 el triband trapped beam CA-33 and Kenpro KR-600 RC rotator, $250 the lot, buyer to dismantle & remove. All subject to near offers. All gear in GWO at last use. Keith VK2AXN QTHR, kandpa@bigpond.com, 02 9489 0304 day only

•Rotator Kenpro KR-2000RC VG cond. with control box, new mast clamp, manual; rotator has 2000 kg rotation torque, 10,000 kg braking torque, will support and rotate big sized amateur antenna array, $500. Manfred VK2RV QTHR, phone 02 4938 1560, email mgmeyer@ozemail.com.au

FOR SALE VIC

•Analog FET multimeter, DSE model Q1143, $20. Frequency counter, 10 Hz to 2.4 GHz, hand-held, battery operation, Optoelectronics model M1, $80. Telecommunication headset (headphones & mike), Gamma model LH-085 (new), $20. Digital LCR meter, model 4070 from Honeytec, measures inductance, capacitance and resistance, with transistor test function. Like new, $50. Drew Diamond VK3XU, phone 03 9722 1620 QTHR.

WANTED QLD

•KLM-160 – 2 metre linear amp. circuit and/ or handbook required, or information as to how such may be obtained. QTHR or VK4ENG@iprimus.com.au

WANTED SA

Upper and lower drum assembly for a VCR Philips model VR 6940 unused. Wall poster of CRT Philips 20-AX (500X series) inline gun self-converging colour picture tube. C S Ratcliff 08 8520 2988

MISCELLANEOUS

•Old copies AR to give away - Sept 1998 (3), Oct 1998 (17), Nov 1998 (7), Feb 1999 (2), March 1999 (24), May 1999 (12), July 2001 (1), Aug 2001 (1), Sept 2001 (2), Nov 2001 (2), June 2003 (1), July 2003 (1), all 2004 (12). Might be useful rather than recycle. M M Gell VK5ZLC QTHR

• **The WIA QSL Collection requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

TRADE ADS

PSK-31, SSTV, RTTY SOUNDBOARD Interfaces Fully isolated, ready to plug in. http://www.G3LIV.CO.UK, johnny@melvin.com, G3LIV QTHR.

About hamads....

- Hamads may be submitted by email **(preferred)** or on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: ***newunltd@bigpond.net.au***

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793.* **Fax:** *03 9756 7031*

TRADE PRACTICES ACT
It Is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

ADVERTISERS INDEX

AEI	19	Niue	IBC
Andrews	9	Ozgear	29
Benelec	IFC	TTS	8
Com-an-tena	23	Small ads	55
TET-Emtron	16	VK Discounts	55
G & C	17	WinLink	35
Icom	OBC	www.vk3ajj.com	55

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

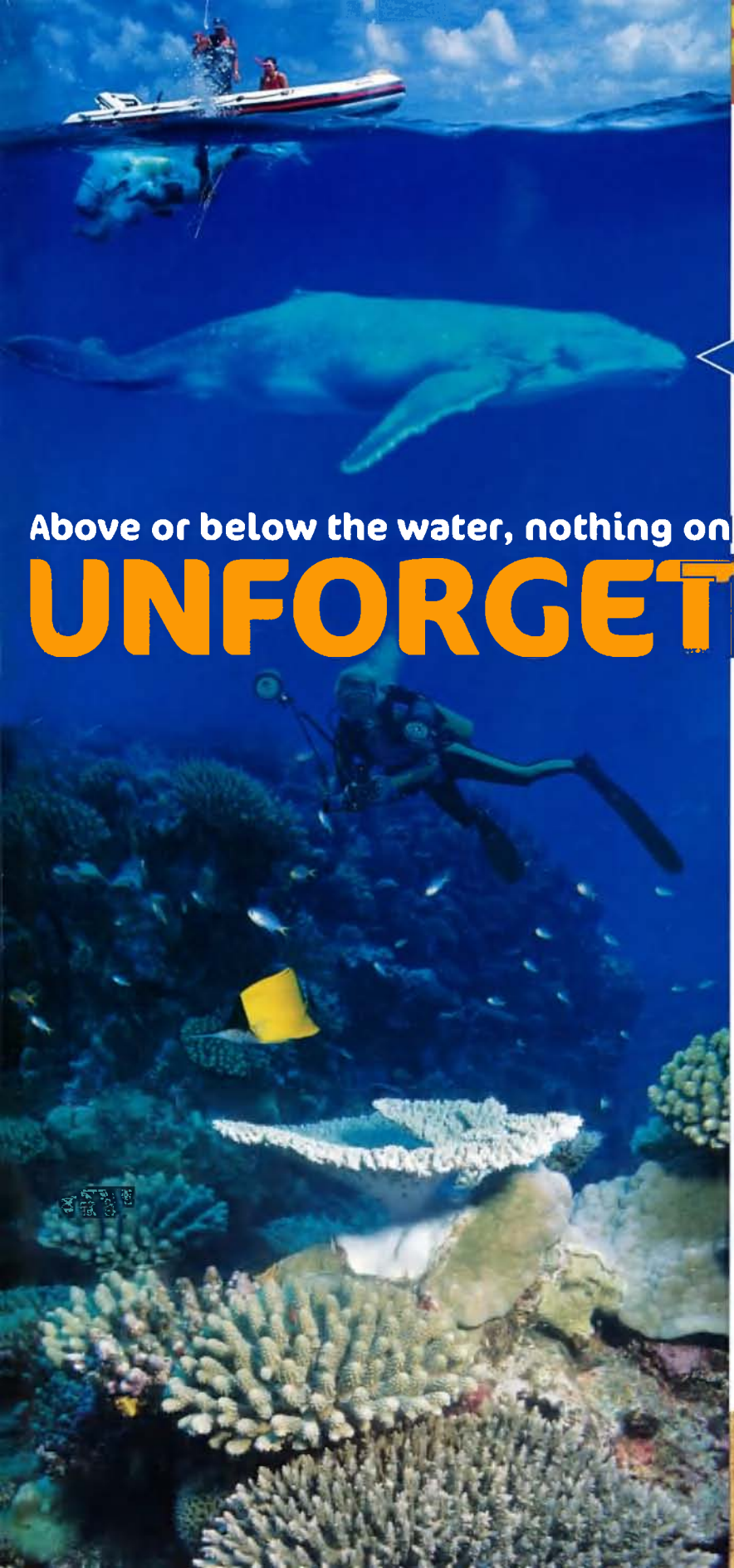
WIA membership fees are: **$ 75 for full members (F grade), $ 70 for pensioners and students (G and S grade), and $ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jlmac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 148.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.



Why not combine a South Pacific holiday with your favourite hobby?

8 nights from only $1729*

Above or below the water, nothing on Earth comes close to...

UNFORGETTABLE NIUE

Includes 8 nights accommodation at Namukulu Motel in a self-contained bungalow, return airfares ex Sydney, return airport transfers, all pre-paid taxes, levies and charges

PLUS free breakfast starter pack on arrival and
FREE tropical fruit when available

talpacific Holidays
... anything else is a compromise

1300 137 727

Polynesian Airlines of Samoa

NIUE
undiscovered unspoiled unbelievable

*Conditions valid for travel ex Sydney only. Please enquire for prices from other ports. All costs are in Australian dollars and are twin share per person. Additional nights may be necessary due to flight schedules. Valid for travel . 01 Jul – 30 Nov 05 Further conditions & cancellatio fees apply

For more information about Niue visit
www.niueisland.com
1300 136 483

ICOM'S GREAT CHAMPIONS

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shape • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706.

Now includes 70cm @ 20W and 50W on 2m
Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch Detachable Front Panel (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied:HM133.

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM
Wideband receive 495 KHz - 1 GHz
555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

ICOM

find your nearest ICOM dealer at

PH416_AM02

www.icom.net.au or (03) 9549 7500

Volume 73 No 8
August 2005

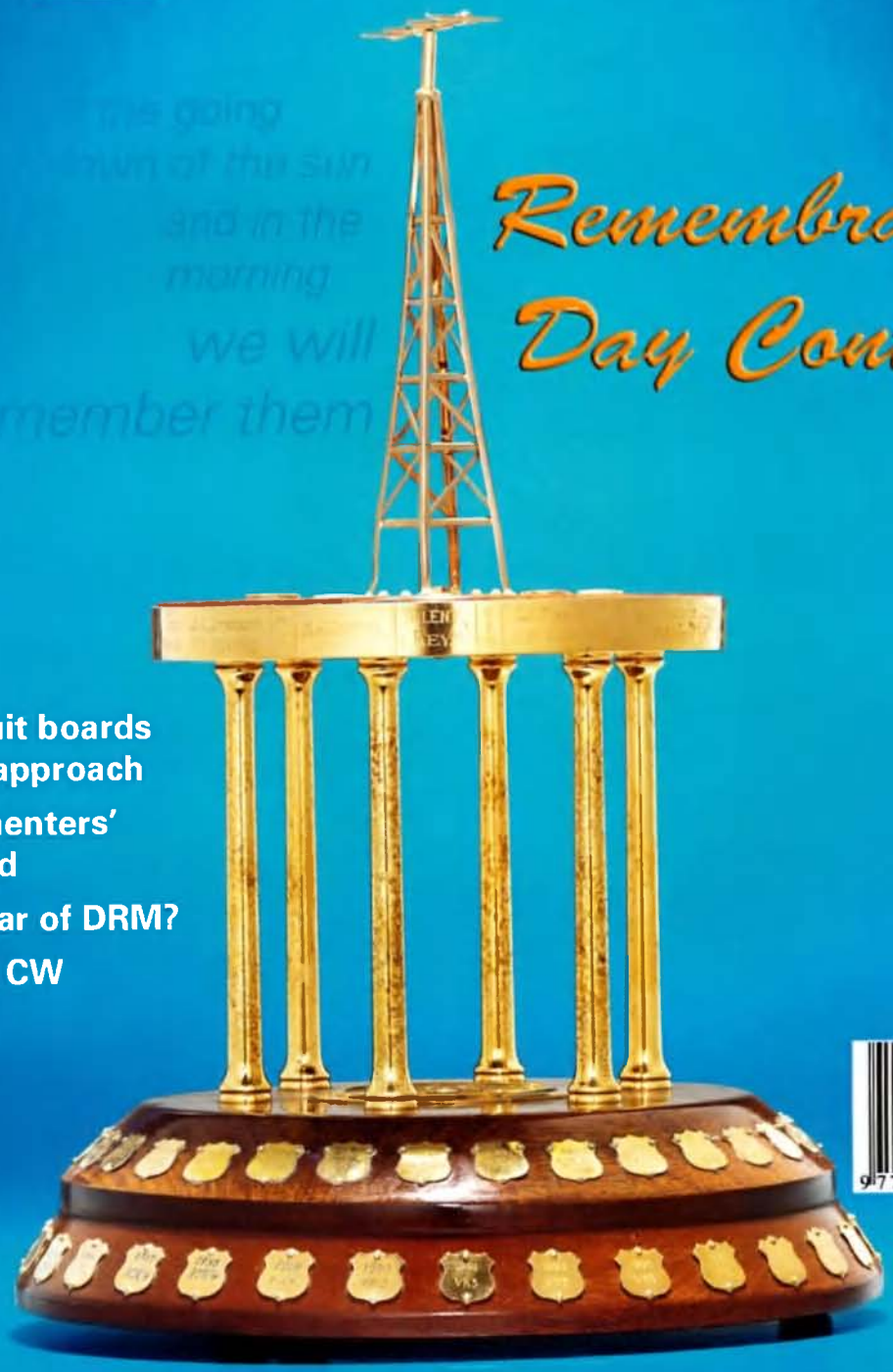
Amateur Radio

$6.50
incl GST

WIRELESS INSTITUTE OF AUSTRALIA

The magazine for AUSTRALIAN radio amateurs

Remembrance Day Contest



INSIDE:

Printed circuit boards — a simple approach

The experimenters' "Blob" board

2005: the year of DRM?

A dual band CW transceiver

9 770002 685086 08

BENELEC

YAESU

BENELEC 3 YEAR YAESU Australian WARRANTY

FTDX9000D 200 W Version HF/50 MHz

Large TFT Display, Built-in Memory Board, Main and Sub Receiver VRF, Full Dual RX, "μ" Tuning (3 modules) Installed, Internal Switching Power Supply.

FT-1000MP Mark V

200 W All Mode HF Transceiver

- High Power Output
- Wide Receiver Coverage
- High-Speed Automatic Antenna Tuner
- TX Microphone Equalizer
- RX Speech Processor

Price $ 5,113.10

FT-1000MP Mark V Field

100 W All Mode HF Transceiver

- High Power Output
- High-Speed Automatic Antenna Tuner
- RX Speech Processor

Price $ 4,436.30

FT-857D

Now includes DSP2 unit built-in

- Ultra Compact + All Mode Transceiver
- 160-10m / 6m / 2m / 70cm
- 100W, 100W, 50W, 20W

Ideal Antenna:
ATAS 25 / ATAS120 / Comet UHV6

Price $ 1,538.10

FT-847

Multi-Mode HF/VHF/UHF Satellite Transceiver

- Full Duplex Satellite Operation
- 160-6m / 2m / 70cm
- 100W, 50W, 20W

Price $ 3,007.80

FT-817ND

Now includes FNB72 Internal Battery

- Ultra Compact 135 x 38 x 165mm
- All Mode Portable Transceiver
- 160 - 10m / 6m / 2m / 70cm
- 0.5-5 Watts Selectable

Ideal Antenna:
ATAS 25 /UHV6

Price $ 1,260.20

FT-897D

High Performance All in One Portable Base Transceiver

- Portable / Mobile / Base All Mode Txr
- 160-10m / 6m / 2m / 70cm
- 100W, 100W, 50W, 20W

Price $ 1,728.30

Ideal Antenna:
ATAS 25 /ATAS120 / Comet UHV6

All Price includes GST

Benelec Approved Amateur Transceiver Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosund.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
sales@strictlyham.com.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

Ozhelp Services
Tel: 07 3273 7263
sales@ozgear.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8285 2400
brenton@posnav.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 8
August 2005

The Journal of the Wireless Institute of Australia
ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

2005: the year of DRM? 9
John Cartmill VK4BJ
OzSpid antenna rotator (Review and report) 14
Kevin D Peacock VK4KKD
PACTOR and other data emissions 16
Marc Robinson VK2BUA
A century for a gentleman radio amateur 27
Jim Linton VK3PC
Home brew – the satisfaction of "rolling your own" 30
David A Pilley VK2AYD
NIUE: Dxer's Delight 56
Murray Lycan VE7HA

TECHNICAL

Printed circuit boards — a simple approach 5
Godfrey Williams VK5BGW
The experimenters' "Blob" board 7
Drew Diamond VK3XU
A dual band CW transceiver Part 1 18
Dale Hughes VK2DSH
Remembrance Day operation from Mallala War Grave Cemetry 23
Steve Mahony VK5AIM
Using "low cost" parts in critical applications – is it worth it? 24
Felix Scerri VK4FUQ
A backpacker's delight – the folding J-pole (Technical Abstracts) 25
Peter Gibson VK3AZL
Nylon washers as VHF toroids (Technical Abstracts) 26
Peter Gibson VK3AZL

COLUMNS

ALARA 31
AMSAT 48
Award 54
Beyond our shores 45
Contests 41
Directory 29
DXCC standings 53
DX~ News & Views 55
Editorial comment 2
Gridsquare standings 39
Hamads 50
HF predictions 46
News from... 32
VK2 32
VK3 32
VK4 ..... 33, 35
VK5 33
VK7 34
Over to you 44, 52
Silent keys 28, 32, 52
Sunspots 54
Spotlight on SWLing 40
Technical Abstracts 25
VHF/UHF – an expanding world 36
WIA comment 3
WIA news 4

Our Cover this month

The beautiful WIA Remembrance Day Contest trophy. The photograph was taken by Melissa Lau. The Contest will take place on August 13 and 14. Details can be found in the July edition of Amateur Radio.

Contributions to Amateur Radio
Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues
Back Issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies
When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer
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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

Judith Oliver	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
Assistant Treasurer	Bruce Bathols	VK3UV

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	Glenn Dunstan	VK4DU
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glenn Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

Settling into Contest mode

The year has passed into the second half; winter is with us and this month we have the RD Contest. We can get the rig fired up and with the heat turned up in the shack and the coffee pot simmering we can settle into "Contest Mode" and contact some old friends and remember those who served in wars to keep us free.

The RD specifically remembers those who died in World War 2. This year has seen a major change in the rules and as we prepare for, participate in and finalise our logs for submission let us think what other changes might be made. Do we need to change the dedication of the contest and broaden it to all those who died in war? Do we still need to pit state against state? If not should we just run it as individuals and/or groups against each other? This is the WIA's major national contest so it is the Australian Amateurs who should finally decide how we run the contest. So please pass your views to the Remembrance Day Contest Manager, Chris Edmondson, VK4AA at the addresses in the Contest rules section 16 on page 44 on July AR.

I have been sorting out my gear for WICEN support of the Toyota Rally of SA on August 6/7. I never thought a system which "worked" last year could be so out of adjustment for this year's operations. Another case of check it all out as early as possible. By the time you read this I will either be saying TG or maybe using words I should not use in church!

This highlights one of the main things about emergency response groups; they have to be ready to roll when called, not two days later when they have got all the gear together. I am sure this is a lesson well learnt years ago on the eastern seaboard where floods and storms are more frequent and more severe than elsewhere in Australia.

I have been trying to tidy up the few projects I mentioned in previous editorials and find they all suffered a similar fate. I proved they worked but never did the final tidy up and screwed the lids on.

There is good news this month about the Foundation Licence. We should have it by the end of the year. This brings up a point of good manners. These new licencees may have got their licence in a way some of us thought too easy, but they got it. Given they are very much beginners, it is our job as experienced operators to be sympathetic to the new operators' problems and assist them to solve them. The new licensees will be learning more from experience after licensing than we "Old Fogies" had to but times are changing. The old guard should realise that things that were important in our theory exams are now outdated and things in the new syllabuses we will never learn or maybe only learn with difficulty.

So with that food for thought 73 and "Good Luck in the Contest"

ar

August events:

Remembrance Day Contest
13 & 14 August

ALARA Contest
27 & 28 August

Blue Mountains Winterfest
27 August

Michael Owen VK3KI

Full ahead for the new amateur licence structure

We have all been concerned at the delay in the introduction of the new Foundation Licence and the changed privileges for the existing licences, particularly the Novice licences.

The WIA has been in constant contact with the ACMA in relation to the new licence structure, and has recently received sufficient clarification on some issues to enable the WIA Board to commit to the costs and resource involved in putting into effect the accredited assessor system that I have previously described, an essential step in the early issuance of the new Foundation Licence in particular.

In late May Dr Bob Horton, then Acting Chairman of the ACA, advised the WIA that the Authority would expedite the introduction of the new licensing arrangements by introducing the new Advanced, Standard and Foundation amateur licences first, with the other changes identified in the Outcomes of the Review of the Amateur Service being addressed subsequently.

However, in order for the new licences to come into effect, it is necessary to amend a number of legislative instruments including the Amateur Licence Conditions Determination and the Qualified Operators Determination. A Determination is subordinate legislation and has the force of law. Amendments to legislation are subject to very strict procedures including a requirement that they must be placed before Parliament and may be disallowed.

The amendments are in the process of being drafted by the specialist legislative draftsmen in the Attorney Generals Department. When this process is complete, the amending Determinations are submitted to the ACMA Board for its formal approval. The Determinations will come into force when registered on the Federal Register of Legislative Instruments. At this time the amending Determinations will be placed on the ACMA's website.

It is only when the Determinations are so amended that the ACMA will be able to issue certificates of proficiency to enable the issue of the new Foundation and other licences.

The WIA is now satisfied that we can go ahead with accrediting assessors as I have previously described. We know that the ACMA will issue certificates of proficiency for the new licences on the basis of the submission of evidence of qualification by the WIA, in turn based on certification by WIA Assessors, all as described in the document "Assessment of Competency in Amateur Radio, March 2005" which can be found on the WIA website.

I believe that the process I have described will result in the first Foundation Certificates of Proficiency being able to be issued in September.

But it is not as simple as that.

To achieve this result it means that the WIA, the clubs and very many individuals must do a great deal in a very short time.

Mr Fred Swainston on behalf of a Registered Training Organisation (RTO) will conduct Amateur Radio Competency Assessment training on behalf of the WIA over a full weekend in each of Brisbane, Sydney, Melbourne and Adelaide. The weekend will be quite intensive, with the training being conducted from 8.30 am to 4 pm on each day.

Final dates and the venues for each training course will be announced very shortly.

Unfortunately only about 16 candidates nominated by WIA Affiliated Clubs can be accommodated at each course, and so in the ordinary course, only one candidate may be able to be accepted from each club for this initial training. It is desired to achieve as wide a geographical spread of accredited Assessors as possible, and if the number of potential candidates who would otherwise be accepted exceed the number of places, this will then be the criterion used to select candidates.

Candidates must hold either an Unrestricted, Intermediate or Limited amateur licence, and be a member of the WIA.

After successful completion of the accredited training course the candidates will be qualified to apply for registration as an Approved WIA Assessor, and will then be able to assess candidates for the Foundation, Standard and Advanced amateur licences.

Through various state and regional representatives, the WIA has already started to contact clubs right across the country to finalise these arrangements.

Of course, if a club is not yet affiliated, we will be able to arrange affiliation very quickly indeed, once we receive the completed application for affiliation.

If any Affiliated Club is unable to meet all the costs involved in respect of the attendance of their nominated candidate, the club should contact the WIA secretary as we have set aside some funds for assisting clubs in such circumstances.

Of course, as is made clear in the Outcomes, the ACMA will be seeking to outsource the amateur examinations, and will therefore be going down the path leading to an open tender.

The WIA will, of course, be seeking to retain the right to conduct amateur examinations. We believe that no other organisation, with its Affiliated Clubs spread across the country can provide the service that we can.

Be that as it may be, the tender process necessarily means that whatever the ACMA does, it cannot be seen to endorse any potential candidate in the tender process.

That has caused the use of cautious language in even achieving sufficient assurance for the WIA Board to proceed as I have now outlined.

We now have that sufficient assurance, and it is now up to us, with the help of so many people and with the help of the clubs and their most qualified candidates to make the vision of a new licence structure, with a Foundation Licence attractive to a new group of amateurs, hopefully moving on to the new privileges of the Standard Licence, privileges immediately available to the existing Novice licencees, a reality – a new world of amateur radio in Australia.

ar

WIA news

FCC proposes to drop Morse Code requirement for all licence classes

The ARRL reports that the US Federal Communications Commission (FCC) has proposed dropping the 5 WPM Morse code element as a requirement to obtain an Amateur Radio licence of any class. The Commission recommended the change to its Part 97 Amateur Service rules in a Notice of Proposed Rule Making (NPRM) in WT Docket 05-235. Any rule changes proposed in the NPRM would not become final until the FCC gathers additional public comments, formally adopts any changes to its rules and concludes the proceeding by issuing a Report and Order (R&O) spelling out the changes and specifying an effective date. That's not likely to happen for several months.

FCC declines other restructure proposals

In 2004, the ARRL filed a Petition for Rule Making asking the FCC to amend Part 97 to complete the Amateur Service restructuring begun in 1999 but "left unfinished." The ARRL called on the FCC to create a new entry-level licence, reduce the number of actual licence classes to three and drop the Morse code testing requirement for all classes except for Amateur Extra. The FCC declined in its NPRM to go forward with any other suggested changes to Amateur Service licensing rules or operating privileges beyond elimination of the Morse requirement.

The Blue Mountains Radio Club Winterfest

The Blue Mountains Amateur Radio Club will be holding WINTERFEST on Saturday August 27 2005 at the 1st Blaxland Scout Hall, Reading Street Glenbrook NSW. Last year was a very successful event with over 100 attendees, including sellers. This year there will be an even larger number of sellers attending, including VK Cables, Action Communications (an authorised Benelec Dealer) and the Amateur Radio NSW Bookshop. Nepean Amateur Radio Group and Chifley Amateur Radio Club will also be attending. There will be a large number of private sellers participating in the car boot sale, which proved very popular last year.

A Memorial Service for Geoff Taylor, VK5TY

Geoff passed away on June 21 while on holiday in Britain with his wife Christine, VK5CTY.

Geoff was aged 75, a Life Member of the WIA, a former Federal Councillor for SA and NT Division, he served as President of the SA & NT Division, he was also as a Commissioner for Scout Radio, he had been Site Coordinator for the refurbishing the Burly Griffin Building, he was a WICEN Director and in his spare time ran an amateur radio school.

The service was held on Saturday, July 16 in the Unley Citizens Centre, Unley. Many were present and many tributes were paid to Geoff.

June Fox retires from the WIA

WIA President, Michael Owen, VK3KI made the following statement on the retirement of June Fox on 1 July 2005:

"I am very sorry that June has retired, because to me June represented a continuity for the WIA, a resource of knowledge that is unsurpassed, and a devotion to an organization and its people that I have found amazing.

I know that I have said it many times, but let me say it again, for many of us June was the friendly cheerful voice on the phone who was the WIA.

When I became involved with the national WIA in May last year, I wondered how June would react. I knew that it would mean a great deal of extra work, the setting of new priorities and great change.

I can tell you that June was completely supportive, and did everything she could to assist the change and to make it a success.

The WIA is not a simple organization, but a very complex organization with many, many small tasks and exceptions to almost everything, and this was particularly so when the structure was federal and the office was meeting the needs of 7 different owners with 7 different requirements. That is why if it had all been written down I suspect the book would be very large and very complicated. That is why knowledge was so important.

That is why I very much regret June's retirement, though I am grateful that she will still be there to help us by sharing her knowledge.

For us all, and for myself, I would like to express our sincere thanks to June for her help, her courtesy and her cheerful contribution to amateur radio over the years."

ar

Printed circuit boards — *a simple approach*

Godfrey Williams VK5BGW

Reading Malcolm Haskard's (VK5BA) article "Simple Homebrew PCB Artwork" in AR July 2004 inspired me to see just how I could use my computer and its peripherals to improve the production of the occasional printed circuit board. I have tried all methods, photo sensitive board, clear transparency artwork and so on but always return to the "Trusty" direct etch pen method. This usually involves drawing out the component placement on a sheet of paper and then by working in "Mirror Mode" marking the holes to be drilled on the copper side of the board and usually getting lost and confused in the process. The same confusion applies when drawing the tracks and pads on the copper so the end result is a workable board that is usually flawed in some way. I don't get on well with the intricacies and secrets of the various computer programs available to produce PC board patterns, so some thought on the subject led me to the following method.

Figure 1 shows the component side of a board drawn twice size (May not be to scale here). This makes the drawing easier and improves accuracy, so all pin spaces, components etc will be multiplied in size by a factor of two. The pin-outs are marked by red pen to provide a clear drilling point. In this example a plastic template was used to draw the circular drilling points. Now scan the drawing at 50% magnification and after that operation is complete click on Image, select flip horizontal and then print. The result is the component and pin-out placements as viewed from the copper side of the board and at the actual size of the board required (Figure 2). You will find that the reduction in size is very accurate and furthermore any measurement errors in the original drawing are reduced by a factor of two. In this case the drilling points were reduced to about 1 mm for a nice sharp reference for accurate drilling.

Now here comes the "Clever Bit"!? Carefully cut out the print and, using a non-water based glue, paste it to the copper side of the board. When dry, and using, say, a small screwdriver with its tip filed to a sharp point, punch all the holes to be drilled. A small hobby hammer or similar is more than adequate but give the punch a reasonable tap to insure that the drill bit will have a good start. Remove the paper and adhesive and drill the holes, afterwards scrubbing the board with steel wool to get rid of any traces of glue and also to remove any copper burrs. If the board is large, then one may have to resort to an actual size drawing, scanning at 100 % to suit the dimensions of the normal flat bed scanner. If the board is very small it can be drawn at four times size and reduced by 25% when scanning. (Computer wise there is many a road to the "Clever Bit". Readers who find hand drawing tedious no doubt will find them or make good use of Malcolm's idea. Ed)

Now back to our original drawing. By referring to the circuit and using say a red marking pen draw in the connecting tracks as seen from the component side. Scan at 50 % and again choose image and flip horizontal and print. Now we have the components and pin-outs as before but including the tracks as seen from the copper side of the board (figure 3), making it a relatively easy copying exercise to draw in the pads and tracks with a direct etch pen. This scanning operation could be combined with the first but I prefer to do them separately as an aid to clarity.

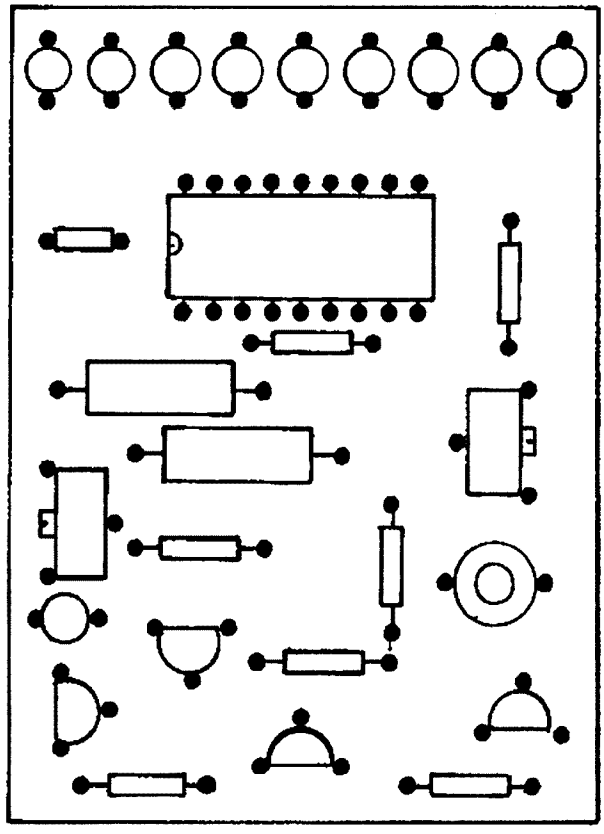


Figure 1

Drawing with a direct etch pen is not difficult and with care and a good nib tracks narrow enough to pass between IC pins is achievable. The pen I use is "Action Marker fine line 33 Pc 901 blue" (DS Cat. N5181). This pen has a valve in it which is opened by pressing down on the nib allowing the ink to flow, the nib needs to be kept "wettish", but not overly so to produce proper ink coverage. The copper side of the board needs to be bright and "Squeaky" clean otherwise the etching fluid will find its way under the ink and eat away at the copper we don't want removed. After a thorough scrubbing with steel wool use an abrasive household cleaner to render the copper absolutely free of grease etc. Rinse and dry and don't touch it with your fingers. When drawing the pads and tracks hold the board on the work surface with the sharp point we used

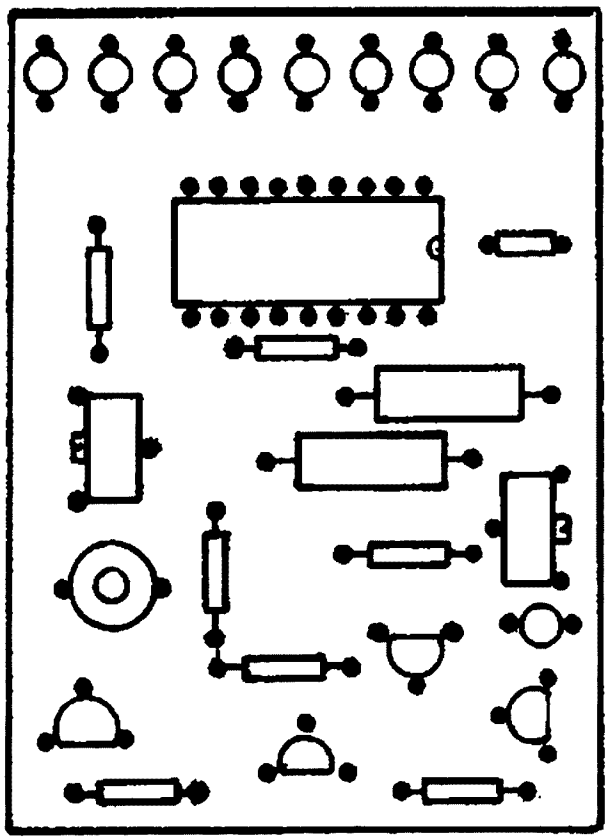


Figure 2

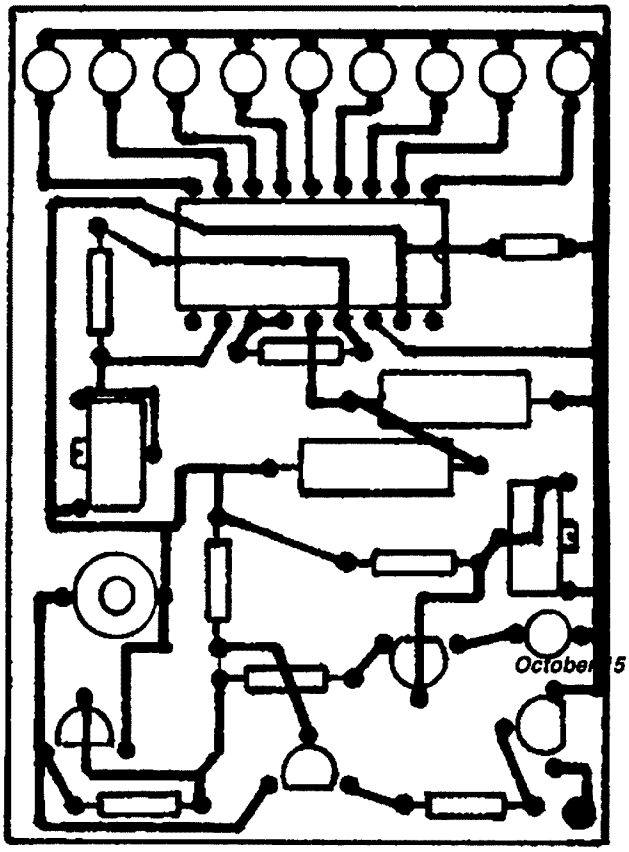


Figure 3

for punching the drill holes. Once the drawing is complete allow overnight drying before beginning the etching process. Should a board be large or complex and it not possible to complete the drawing in one go, the copper may become discoloured but as long as it is kept clean the ink will still adhere.

The etchant I prefer is ammonium persulphate (DS Cat N5654) as when mixed it is a clear liquid allowing one to see when the process is complete. As copper is etched away the liquid will take on a bluish tinge. I have seen it written that the direct etch pen ink is not suitable for this etchant but there is no truth in this. The mixture needs to be kept warm to hot and moderately agitated while the action is in progress. The mixture can be contained in a clear plastic open container (lunch box, etc) and kept floating in hot water. The board should be immersed in the etchant copper side up, a liquid depth of 20 mm is adequate. The first indication that the process has begun is a slight lightening of the copper colour. This indicates that it is gradually being eaten away, eventually becoming extremely thin. Then the process speeds up as the copper is seen to rapidly disappear from the edges of the tracks until the etching is complete. It is important that the mixture be agitated continually and kept at a temperature that is just a little too hot to touch.

The direct etch pen method would probably be the least expensive method of producing one off boards but there is no reason that it could not be used for identical boards in moderate numbers. Producing a nicely drawn board can be satisfying and contributes more to the notion (I built it!). The board in question, a nicad voltmeter with recycling circuitry, was drawn in twenty minutes. The scanned and reduced drawings can be saved on your computer's hard drive and retrieved for later use. The scanner used is a Canon. Note that other types may use different terminology to image or flip horizontal. Since having this "Brainwave", I now have the images shown stored on my computer for retrieval whenever required. If a board is required all that I have to do in this case is print Figure 2 then glue, drill, clean, draw from Figure 3 and etch. This, I claim, would be cheaper and probably not much more time consuming than accessing the artwork, applying to and exposing photo sensitive board, developing, etching and drilling.

ar

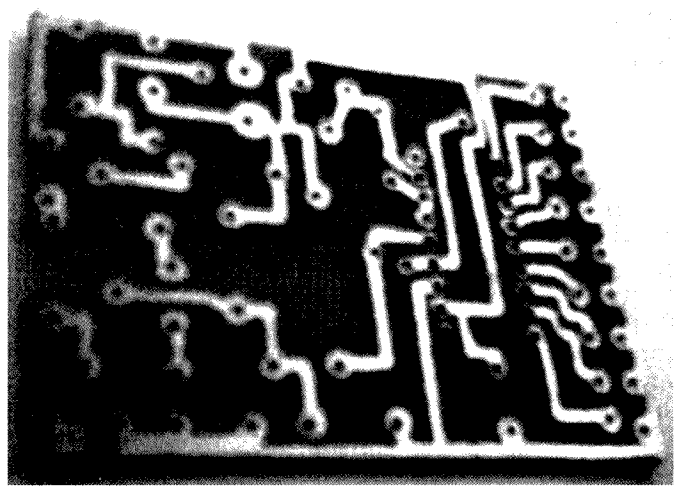


Photo 1

The experimenters' "Blob" board

Drew Diamond VK3XU

When it is necessary to develop a circuit to requirements, a quick, cheap and effective method is to employ the good old "blob" technique. A 300 x 300 mm sheet of ordinary double- or single-sided circuit board is suggested as a dedicated "work-bench" for prototyping and experimental circuit work.

The lash-up pictured shows my 1.8 - 2.0 MHz receiver in the final stages of circuit development. The sub-assemblies are comprised of smaller scraps of circuit board, representing the perceived individual stages of the project. They may be soldered to the main board in several places with short lengths of tinned copper wire. Top left is the 1.8 - 2 MHz input band-pass filter. The deliciously messy board to the right of that is the mixer, AGC and audio section. The circuit board box near the centre is the finished VFO and phase splitter unit (in order to plan the remaining circuitry, it was necessary to build the VFO assembly properly in the first instance). The BFO is at the lower right.

When modelling a project in this way, we cannot assume that it will work entirely satisfactorily in the production model unless all stages are physically and electrically put together in close proximity upon a common "chassis". For instance, if a separate signal generator only were used to supply the VFO and/or BFO signals, it may be found that, when made as a unit and located near the main circuitry (thus sharing a common ground and supply rail[s]), spurious signals become a significant problem.

Similarly, when powered from (say) a stand-alone bench power supply, the circuit may work fine. Whereas, from a transformer-rectifier-regulator mounted right there on the main board, hum and/or mains buzz (particularly with direct-conversion receivers) may be a problem. Hence, having got the circuit working properly using a bench supply, the intended "dedicated" mains supply components should be temporarily tacked to the board, just to be sure.

A combination of "ugly", point-to-point and 'paddyboard' may be applied. For circuits operating at RF, component lead lengths should be made reasonably short. A few spare IC paddyboard substrates fitted with sockets are handy for accommodating chips. When the entire assembly is operating satisfactorily, then it is easily possible to make a reasonable estimate of the circuit board and enclosure size(s) for a much tidier, and permanent, paddyboard (or similar) style construction for the production model.

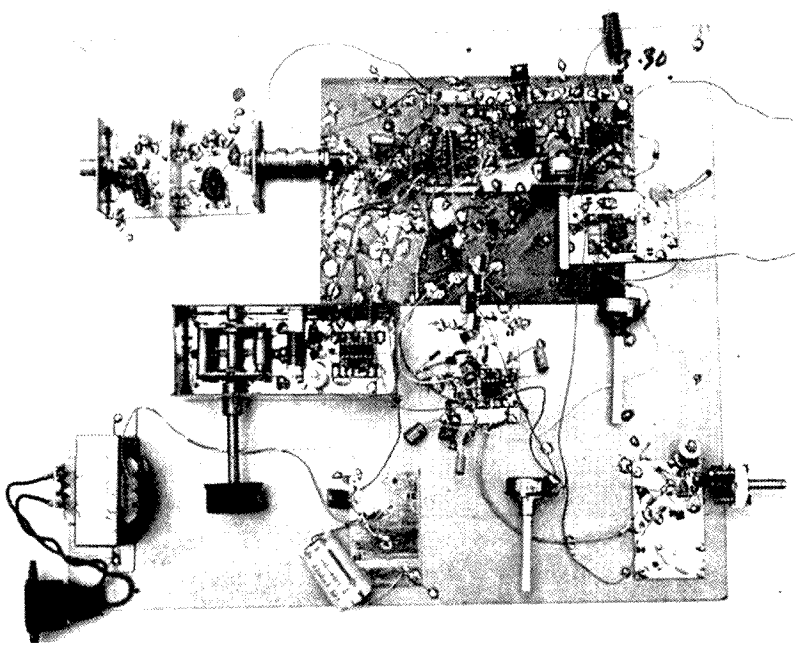


Photo 1. 1.8 – 2.0 MHz receiver in development

Related articles

1. "Build It Yourself From QST"; Hale, QST April - July 1992 (excellent series).
2. "How to Lay Out RF Circuits" I White G3SEK, RadCom February/March 1991.
3. "Manhattan-Style Building Techniques"; C Adams K7QO, Homebrewer #1 (journal of the American QRP Club - www.amqrp.org), Summer, 2003, pp 20 ~ 23.
4. ""Paddyboard" Circuit Construction"; Diamond, Amateur Radio, February 1995.
5. "Building Successful "Rat's Nests""; A Pierson, Electronics Australia, March/April 1997.

ar

TTS Systems Communications Equipment

TTS Systems www.ttssystems.com.au **FREE CATALOGUE**

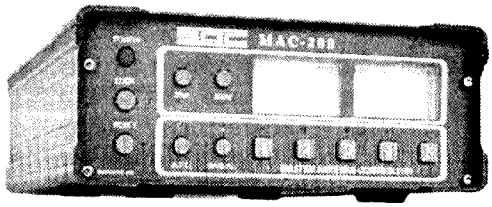
HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

MAC-200

MASTER ANTENNA CONTROLLER

(Smartuner Built-in)



Control up to 5 Antennas

Select the right antenna, for the right band, at the right time with the MAC-200. The Master Antenna Controller operates as your base station control center, eliminating complicated switching and tuning. With the MAC-200, you can select between up to five antennas and tune automatically to minimum SWR. You can monitor your power and SWR with two convenient meters on the front panel of the unit. The MAC-200 puts you in control of your antennas.

SMARTUNER™ TECHNOLOGY INSIDE

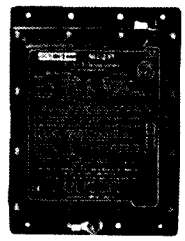
With SGCs Smartuner technology inside, the MAC-200 uses two built in microprocessors to automatically select the correct antenna for your operating frequency, quickly and accurately. It stores the correct settings in memory and will recall the settings for a previous frequency in less than ten milliseconds. The MAC-200 is the perfect choice for anyone using multiple antennas in a base station system.

TECHNICAL SPECIFICATIONS

HF Frequency Range:	1.8 to 60 MHz
Power Input Range:	1.5 to 200W(PEP)
Number of Inputs:	1 type SO-239
Number of Outputs:	5 (1 end fed, 1 bal., 3 coaxial)
VSWR:	Typical: Less than 2:1
DC Input Requirement:	+13.8 VDC(nominal)
DC Operating Range:	+10 to 18.5 VDC
Input Current:	230 milli Amps average
Initial set time:	Typical: Less than 2 seconds
Recurrent set time:	Typical: Less than 10 milliseconds
Memory Capacity:	168 non-volatile locations
Antenna Length:	(7-60MHz), 40ft (3-60MHz)100ft(1.8-60MHz)
Installation:	Desktop
Operating Temperature	-35 to +70 degrees C
Size (approx):	22L x 16.5W x 8H cm
Weight:	2.3Kilo
Case Construction:	Extruded Aluminum*
Cables, Connections:	No cables supplied
Meters:	1 SWR, 1 20/200 watt power scale
Impedance Ranges:	Longwire: .2 - 5000 ohms ..... Feedline: 5 - 1000 ohms
MSRP:	Balanced: 5 - 1000 ohms

"The box that brought my amateur radio hobby back to life"

SG-237 Smartuner™



High density surface mount components in a 4 layer PCB on a chassis plate: all providing high efficiency, reliability, performance with excellent electrical and RF ground system. Fully waterproof (.6metre/24 submerged). Case is weather resistant, factory-sealed ABS plastic.

MULTIPLE APPLICATIONS

-- Use for base, mobile, portable, marine or aviation.

Rugged construction and small size allow maximum flexibility. 100W power rating and frequency coverage to 60MHz, matches most popular HF transceivers. Works with balanced or unbalanced antenna: whips, backstays, dipoles, loops and longwires, and requires only 28 feet of antenna for full coverage operation.

HF Frequency Range:	1.8 to 60 MHz
Power Input Range:	3 to 100W (PEP) and 40W
Input Impedance Range:	45 to 55 ohms
VSWR:	Typical: Less than 2:1
DC Input Requirement:	+13.8 VDC (nominal)
DC Operating Range:	+10.5 to 18 VDC
Input Current:	300 milli Amps
Average Tune Time:	Typical: Less than 2 secs
Recurrent set time:	Typical: <10 milliseconds
Memory Capacity:	170 non-volatile locations
Possible Tuning Combos:	1/2 million
Antenna Length:	7 feet (3.5 to 60 MHz) / 28 feet (1.8 to 60 MHz)
Installation:	Any position, ideal at antenna feed point
Size:	9L x 7W x 1.85H inches
Weight:	2 pounds (approx 1 kilo)
Control Cable:	9 ft std shielded 4 cond. RG-58 coax PL-259 conn.
Accessories:	Smartlock™

We can supply the SG237 as an unpackaged board level component at significant saving

Order your 450 ohm Ladder Line NOW

We have

SGC 237 Waterproof Auto Tuners

SGC 239 Economy Auto Tuners

Autek Antenna Analysers

Autek RF 2kW In-line Power meters

Lutron

Lutron Measuring Instruments

Vantage Pro Weather Stations

ADSP SPEAKER

Three modes at the press of a button: no noise reduction; the original ADSP; and the new ADSP2 noise reduction mode which provides up to 26 dB of noise reduction within the passband.

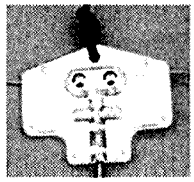
LDG ELECTRONICS

Z100 TUNER AND

Z1000 HIGH POWER AUTO TUNER

TEN-TEC KITS

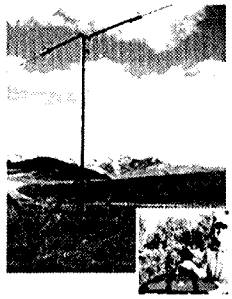
Ten-Tec 3003 Acro-Bat antenna hanger.



UV resistant polycarbonate plastic, S/S hardware. Hammers won't break it. Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna. or ladder line with internal pegs.

BUDDIPOLE

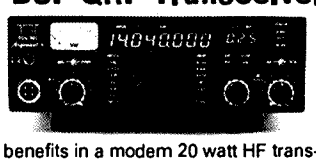
It's a dipole... It's a vertical... It fits in your travel bag! Optimised for transmit power, proven for DX work. Ultra light composite materials and High-Q coils. Zero-loss balun with Quick-Connect feedpoint.



The standard Buddipole antenna comes with—

- Two 22" black anodised aluminium arms
- Two multi-band coils (40m - 10m) with adjustable coil tap pre-marked system
- Two stainless steel telescopic whips, the VersaTee™ with 3/8" x 24 adaptors

Model 516 Argonaut V IF-DSP QRP Transceiver



IF-DSP benefits in a modern 20 watt HF transceiver. 20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjustable from 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP). Metering measures forward or reflected power in switchable 2 or 20 watt scales.

2005: the year of DRM?

Is this the rebirth of shortwave broadcasting?

John Cartmill VK4BJ

Over the last decade or two, traditional listeners to shortwave broadcasts have been drifting to more reliable and higher quality local FM broadcasts or to the many satellite signals now available. 2005 could well see the beginning of the reversal of this trend. Reasonable cost consumer DRM receivers are due to be released into the market (European at least) in time for Christmas 2005. DRM, Digital Radio Mondiale (Digital Radio Worldwide) is the new, internationally recognised standard for digital short wave broadcasting. While there are competing standards for digital radio on MF and VHF bands, DRM is universally recognised as the only digital standard for HF. Already more than 60 broadcasters worldwide are using DRM.

Keen to fast track my understanding of DRM, I purchased a Ten Tech RX320D receiver and a copy of the DRM software. Essentially, the RX320D is a modified version of the RX320 and produces an additional IF output at 12 kHz that is within the frequency range of a computer sound card. The DRM software then uses the soundcard to decode the received data back into the programmes or services encoded into the DRM data stream. The computer I use is a DELL Inspiron 8100, but many other computers and sound cards have been found to be satisfactory.

What does DRM sound like?

The first thing noticed is the delay before audio is heard after tuning into a new DRM station. A delay of ten to twenty seconds is typical while the receiver locks up to and decodes the incoming data stream.

The immediate observation on hearing live DRM on shortwave for the first time is the quietness of the signal. Gone is all the background noise traditionally associated with shortwave. On occasions, I have even heard the rustle of papers in the broadcast studio.

Almost as obvious is the absence of distortion, particularly that produced by selective fading.

Next is the improved frequency response of the audio with the use of high data rates and/or SRB (Spectral Bandwidth Replication).

And finally, sometimes more than one programme or service is available on the one transmission.

Late in 2004, DW conducted test transmissions with multi service broadcasts with up to four simultaneous independent audio services.

So what have I heard in VK4?

During the A04 season Bonaire beamed signals to VK and ZL for an hour on Saturday and Sunday afternoons. This signal was not particularly reliable in Brisbane but I understand it was better in ZL.

Much better in Brisbane were their morning broadcasts to Europe. These transmissions were particularly regular and reliable.

During the B04 season

DW Trincomalee 21.675 MHz 06:00 to 10:00 UTC.

This is the most reliable daily signal at the time of writing. A low data rate of 11.6 kbps helps make this signal very robust and reliable.

On some evenings I have heard the

four hour broadcast almost drop out free. This is very encouraging given that the signal is beamed from Sri Lanka towards Europe. Even at 11.6 kbps the programme is better quality than even the best analogue AM shortwave transmissions. There is, however, a slight low level "rasping" sound behind speech components of the programme (this is more obvious when listening with headphones.) I am unable to tell if this is due to the high DRM compression or to the combined effect of DRM and the compression on the satellite feed to Sri Lanka. Never-the-less, the resultant audio is very acceptable for shortwave.

An additional 80 bps text message gives station contact details.

VoR (Voice of Russia) Taldom 15.780MHz 07:00 – 10:00 UTC

This signal is only available on occasions, perhaps two or three days per month. However, when conditions allow, the quality at 14.5 kbps is quite good. The improvement over 11.6 kbps is noticeable. On one particularly good evening I even used headphones so that I could more fully enjoy the quality of the music. This is not the usual reason for using headphones for shortwave reception!

Again the 80 bps text message gives station contact details.

DW Sines 17.700 MHz and 17.710 MHz.

17.700 is difficult to receive in VK. A strong AM signal from RCI (Radio China International) on 17.690 prevents any decoding of this DRM transmission. Surprisingly, RCI seems to be using 7.5 kHz audio filtering on their signals rather than the more usual 5 kHz. As a result their upper sideband significantly overlaps the DRM channel.

17.710 MHz is usually free of interference for the first half hour (11:00 to 11:30 UTC).

DW have experimented on this frequency with multiple services. More commonly the signal is AAC SBR Parametric Stereo at 20.7 kbps. At this data rate, the signals are usually not decodable in VK. However, on some occasions, when conditions are just right, I have heard stereo for many minutes at a time with only occasional dropouts. Parametric Stereo sound very good; certainly not what one would traditionally expect a shortwave signal to sound like. Without doubt, the computer audio and speaker system is the major limitation to the quality in my case.

Other stations

MOI Kuwait on 13.620 MHz at 11.6 kbps can be heard some evenings in Arabic between 09:30 and 13:00 UTC.

How is the DRM signal transmitted?

DRM is transmitted as Coded Orthogonal Frequency Division Multiplex (COFDM).

In this way DRM transmissions have much in common with Digital Audio Broadcasts (DAB) and Digital Video Broadcasts (DVB). Each of these formats uses a form of COFDM which is optimised for the peculiarities of the particular use.

The higher DRM data rate transmissions can use more than 200 independent carriers within the normal 10 kHz channel bandwidth.

These carriers are amplitude and phase modulated to produce a constellation of data symbols. 4QAM (Quadrature Amplitude Modulation). 16QAM and 64QAM are used depending on the robustness needed for that portion of the DRM signal.

Many tests were conducted during the development phase of DRM so that modifications to the specification now ensure DRM is best able to handle the high Bit Error Rates (BER) to be expected in a HF radio channel.

The DRM signal has three main components.

The FAC (Fast Access Channel) is a low data rate but highly robust part of the signal that allows the receiver to establish initial lock. Next, the robust SDC (Service Description Channel) gives information on the number and type of services contained in the particular DRM signal. The MSC (Main Service Channel) contains the data for the programmes or services transmitted at that time.

Some of the carriers in the DRM constellation are "reference cells" which provide amplitude and frequency references for the receiver locking.

Within the DRM specification there are four different robust modes.

Within each mode, the broadcaster has a further choice of data rate. In this way, the broadcaster has a large range of choices which trade data rate (quality) for robustness.

Mode A is suitable for ground wave services such as those on the normal MF band.

Mode B is the first choice of skywave broadcasters such as International Shortwave.

Mode C is for more difficult DX HF.

Mode D is suitable for paths with high multi-path and Doppler shift as occurs with NVIS (Near Vertical Incidence Skywave). NVIS is used in the "Tropical Broadcast Bands" at 2, 3 and 5 MHz (2.3 – 2.5, 3.2 – 3.4, and 4.75 – 5.05 MHz).

To date I have seen one transmission in Mode C. All others have been in Mode B.

How is the Audio encoded?

There are three methods used for encoding audio.

AAC, Advanced Audio Coding (part of the MPEG4 specification) is used for music programmes like the radio programmes we are all familiar with. Data rates from 11.6 kbps to 24 kbps are used depending on the quality/robustness choice made by the broadcaster.

SBR, Spectral Bandwidth Replication, can be added to roughly double the perceived audio bandwidth of the programme. To reduce the data rate, the audio bandwidth of a music programme may be reduced to, say, 6 kHz only. SBR can be used to restore the lost bandwidth at a cost of around 2.5 kbps. The SBR analyses the original programme and develops a "helper" signal related to the lost high frequency information. The receiver uses this helper information to generate narrow band noise that is appropriately related to the harmonics that would otherwise be missing from the received signal. The result is quite convincing.

Parametric Stereo can be achieved with additional "helper" style information which enables the receiver to generate an "acceptable stereo ambience". Again

the data rate cost is around 2.5 kbps.

80 bps of the AAC service can be used for a small text message service. Text messages are limited to 128 characters which, from my observations, can be updated every 30 seconds or so.

CELP (Code Excited Linear Prediction) and HVXC (Harmonic Vector eXcitation Coding) are used to encode speech only services. High quality audio using CELP requires about 8 kbps. Telephone/ communications quality audio using HVXC can be achieved at around 3.5 kbps. Again SBR can be added to CELP and HVXC to further improve the apparent audio bandwidth.

In addition to the text messages, the DRM specification also allows for the transmission of non audio services such as multi-media, data files, html pages, etc. I have not yet seen any data transmissions.

Can current transmitters be converted?

After generation at low power level, the DRM signal needs to be amplified in a linear way so as to preserve the amplitude and phase of the constellation symbols. Fortunately, this can be achieved without prohibitively expensive modifications to many high power AM HF transmitters.

To broadcast a DRM signal, the phase component of the signal is generated in the new DRM exciter. The phase component is inserted into the RF input of the transmitter where the frequency synthesizer would normally connect. It is actually a phase modulated RF signal at the assigned frequency of the transmitter.

The amplitude component is fed to the existing modulator, which needs to be modified for increased audio bandwidth so that it can handle the digital nature of the DRM waveform. But the main requirement is that the AM modulator must have a DC connection to the anode of the modulated RF amplifier (the old Class B Modulator with large transformer is unsuitable.)

Most modern high power HF transmitters, however, use a step switch method of anode modulation. Basically, this consists of 48 power supplies of around 700 volts each which are switched in series as required to supply the instantaneous plate voltage needed to produce the modulated output signal. For an un-modulated carrier, half the power supply modules are connected at any one time. When an increase or decrease in instantaneous anode voltage is needed, the appropriate number of modules is switched in and out of circuit. If a reduction of anode voltage is required, a commutating action ensures that the module last turned on, stays on, and a module that has been on for some time is the one switched off. This commutating system continues even for an un-modulated carrier.

A 100 kW AM transmitter produces a peak output power of 400 kW when fully modulated. The peak to average ratio of the DRM signal, with its many carriers, is more like 10 dB so that a 100 kW AM transmitter can produce at best, 40 kW of DRM. Typically, 100 kW AM transmitters seem to be operated at 30 – 40 kW when in DRM mode. If the transmitter is unable to handle the necessary peak output, then compression of some of the constellation symbols will occur, distorting the signal and increasing the Bit Error Rate.

Typically, high power broadcast transmitters use plate modulation only. To further improve the linearity of the amplitude modulated component, screen modulation is added as part of the DRM conversion package. Remember, plate AND screen modulation was common practice in the old AM days of amateur radio.

Offsetting this additional complication and cost is the fact that DRM does not need the same power level as AM (half or less) for the same coverage. For the broadcaster, the reduction in their power bill is very welcome.

International DRM broadcasts from Europe seem to range between 30 and 200 kW.

There are reports that Radio New Zealand has ordered a number of Thales DRM capable transmitters. These will be used in their shortwave service to improve the quality of the programme fed to their many South Pacific Islander re-broadcasters.

Are there special requirements of the DRM receiver?

The performance requirements of a DRM receiver are not beyond those currently available in many medium to high end HF receivers.

Low phase noise is essential, so receivers need to be crystal locked or use a quality synthesiser. The IF bandwidth must also be sufficiently wide to avoid distortion, particularly of the edge-of-band carriers. DRM can operate in several bandwidths from 4.5 kHz to 20 kHz.

DRM "receivers" currently available produce an IF of 12 kHz which is fed to the sound card of a suitable computer for decoding using either the official DRM software (about $AUS110) or the freeware DReaM software.

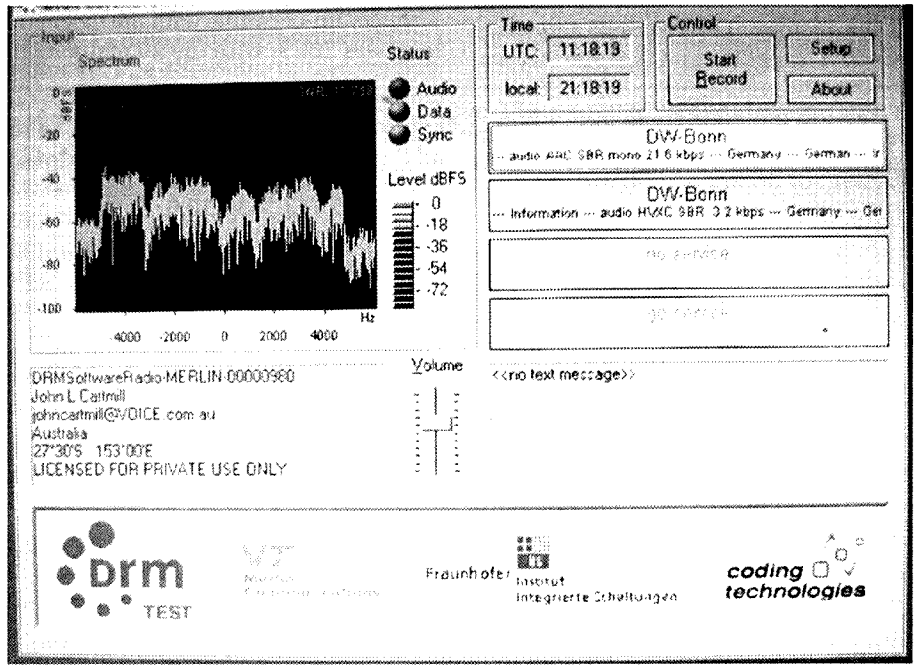


Photo 1

Decoding software

I have used the official DRM software as the "fast track" approach to receiving DRM.

DReaM software needs to be downloaded and compiled using C++. Although I have recently heard reports of compiled versions being available - the legality of these copies would need to be checked. DReaM has some additional sophisticated analysis tools, and can generate a test DRM signal for checking receivers, but requires a computer with a faster CPU. The minimum CPU speed needed is probably around 500 or 700 MHz, so that should not be a serious problem with today's GHz CPUs.

I have not had any experience with the DReaM software, but the official software works quite well.

The DRM software "drives" very nicely and I had no problems setting it up. The spectral display of the signal is very handy and can be used on AM signal as well. With a little experience it is possible to estimate very quickly if the signal is likely to be de-coded. Three lock LEDs indicate when sync, data and audio lock are achieved. The level indicator is essential for setting the input level to the sound card. I have noticed that, if the red overload LED lights, the signal has already overloaded the sound card and DRM sync will be lost.

Once data lock is achieved and the SDC channel decoded, a basic description of each service is displayed in the service blocks located on the right of the display. The required service is selected by clicking on that service box. An active service changes the display background to white. The service block of any service not being transmitted is left greyed out and "no service" displayed.

A record button allows a data analysis of the signal to be saved into a data file for later analysis. An additional programme, not part of the official DRM suite, allows this data to be displayed in graphical format.

At the time of writing there is a fire-sale of the official DRM software at about $AUS70.

This will continue for a short time and then be discontinued. As a bonus, a copy of DReaM software is also included at no additional cost.

Antennas

As with all shortwave listening, the antenna is critical.

At this stage I have had limited opportunity to experiment with antennas. However, I have noticed that a half-wave vertical dipole cut for around 21 MHz often outperforms any other antenna that I have. I am wondering if the lower angle of radiation frequently attributed to vertical antennas produces a more stable signal, which helps the decoding software.

Many European listeners seem to be using magnetic loop antennas. I suspect this is due to space limitations. One comparison has been made between a commercial magnetic loop and a 20 metre amateur Yagi. A signal that was virtually un-copyable with the magnetic loop was 100% with the 20 metre Yagi. Well, I guess that means we don't have to re-write all the antenna handbooks.

Commercial receivers are promised for the European market at least in time for Christmas 2005. However, the lack of an available chip set for these receivers had caused some to doubt this target date and even the future of DRM itself. In January 2005 a joint press release by DRM and Texas Instruments announced that TI has committed to the development of a DRM decoding chipset. TI already produces chipsets for DAB receivers so the addition of DRM is seen as a natural extension. It seems that the last remaining hurdle that could have prevented the deployment of consumer DRM has now been removed.

Amateur radio and DRM

Whenever there is a new technical development, amateur radio operators are not far away. Already there is a HamDream system under development. I have not had time as yet to search for much information on HamDream which I understand is still somewhat "under development". However, I believe that quite reasonable HamDream transmissions have been made within the bandwidth of a typical SSB transmitter. So it will be interesting to see how this develops.

Is there a future for SWLing in the DRM age?

Given that digital transmissions are either perfect or totally absent, will there

Examples of the Log Files created by the DRM Software

DRMSoftwareRadio-MERLIN-00000980

Software Version 2.0.34
Starttime (UTC) 2004-09-07 06:37:41
Frequency 15780 kHz
Latitude 27°30'S
Longitude 153°00'E
Label Voice of Russia
Bitrate 17.38 kbps
Mode B
Bandwidth 10 kHz

Comment

MINUTE SNR SYNC AUDIO TYPE
0000 16 150 1410/10 0
0001 17 150 1470/10 0
0002 18 150 1480/10 0
0003 15 150 1150/10 0
0004 15 149 1290/10 0
0005 15 142 1050/10 0
0006 15 150 1120/10 0
0007 13 150 640/10 0
0008 14 149 1230/10 0
0009 18 150 1480/10 0
0010 19 150 1500/10 0
0011 19 150 1450/10 0
SNR min: 0.0, max: 20.1

DRMSoftwareRadio-MERLIN-00000980

Software Version 2.0.34
Starttime (UTC) 2004-09-07 09:24:35
Frequency 21675 kHz
Latitude 27°30'S
Longitude 153°00'E
Label DW DRM
Bitrate 11.56 kbps
Mode B
Bandwidth 10 kHz

Comment

MINUTE SNR SYNC AUDIO TYPE
0000 0 0 0/00 0
0000 15 150 745/05 0
0001 16 150 750/05 0
0002 17 150 750/05 0
0003 16 150 750/05 0
0004 17 150 750/05 0
0005 17 150 750/05 0
0006 15 149 745/05 0
0007 16 150 745/05 0
0008 17 150 750/05 0
SNR min: 12.5, max: 19.5

be any challenge in short wave listening in the DRM age? My expectation is that SWLing will continue as strongly as in the past. Certainly, ionospheric propagation will continue to be as fickle as ever and reception of marginal DRM signals can be very significantly influenced by the antenna used. My guess is that there will still be plenty to stimulate the imagination and enthusiasm of DRM listeners for some time to come.

Latest developments

At the time of writing, The DRM consortium has just voted to extend the specifications of DRM to include frequencies up to 120 MHz.

In March 2005, DW conducted tests with "slideshow" pictures. I have been absent overseas so I have not had the opportunity to view these.

Thanks

My thanks to Dr John Stanley K4ERO for his many suggestions and corrections to the draft of this article.

For further reading

"Trying to receive the digital (DRM) broadcasts", Brian Tideman VK3BCZ, *Amateur Radio* July 2004

Official DRM home page www.DRM.org

"DRM receiver project" www.DRMrx.org

http://owdjim.gen.nz/chris/radio/ DRM contains many DRM reception reports and audio files

South African Radio League Download source for "Ham Dream" www.sarl.org.za

"Digital Voice: An Update and Forecast", Doug Smith KF6DX *QST* Feb 2002

"The how and why of COFDM", J H Stott, BBC Research and Development, *EBU Technical Review* – Winter 1998

"DRM – key technical features", Jonathan Stott, BBC Research and Development, *EBU Technical Review* – March 2001

DRM Lecture Notes by John Stanley, http://home.att.net/~drmlectures/

ar

Post Script update to DRM

Since writing this article earlier in the year, we have moved into the AO5 Broadcasting Season. As a result, several frequencies and times have changed.

During the late afternoon and early evening the only signal now is DW from Trincomale on 21.675, although I have heard VoR from Taldom near Moscow on a few occasions early in AO5. A better time for listening now seems to be the early hours of the morning. The DW 15.435 MHz transmission on 2nd May was the best DRM signal I have ever received. DREAM software reported a SNR up to 25 dB. I have been told that this is the about the limit of the TenTec Receiver, so the actual signal may have been even better. Classical music with an audio bandwidth of 12 kHz was received virtually drop out free for more than half an hour before I had to leave the shack. Almost 100% of audio frames were decoded correctly.

It is also worth checking 7265 kHz around 0600 UTC. This is an example of two services on the one DRM signal.

Latest DRM transmission times and frequencies are available at

http://www.drm-dx.de

Yes, I have received a copy of the DREAM software and I find that I am now using it in preference to the official DRM software. The difference in performance is very little, but DREAM gives a number of additional readouts which are very helpful in understanding DRM. The SNRs of the 200 or so individual carriers can be viewed graphically; as can the impulse response and a "vector scope" style display of the FAC, SDC and MSC symbols.

The official DRM software is now available from http://www.winradio.com/home/download-drm.htm

The price has also been reduced to approx $US 50.

An updated version of the DRM software is reportedly due for release in a couple of months. This version will include a CELP decoder for low bit rate speech channels.

DRM chip development is proceeding at a pace. Texas Instruments and Radioscape have announced the release of a complete receiver chipset which will decode both DAB and DRM. The chip sets are currently available in small quantity (up to 1,000) for evaluation. Full supply is promised for later this year.

Some 5 or 6 other chip manufactures are reportedly planning to release competing products. This level of competition should help to bring prices down quickly.

Commercial DRM receivers are on target for a European release about October/November this year, priced around $US 250.

Radio New Zealand have announced the purchase of two new Thales DRM transmitters. DRM broadcasts are planned to commence in January 2006 with tests as early as October or November this year. RNZ are currently looking for SWLs in the Pacific area who will become official DRM monitors for them. As an inducement, they are offering free DRM receivers.

The DRM consortium has announced that the DRM standard will be updated to include broadcasts up to 120 MHz. It could be 2007 or 2010 before this is implemented. However this is a strong indication of the position DRM will be taking in the Digital Broadcasting arena.

With so many developments in the last few months, it is clear that DRM is really "going places". Indeed history might well record that it was this decade, and 2005 in particular, that saw the rebirth of Shortwave broadcasting.

Happy DRMing

John VK4BJ

OzSpid antenna rotator
(Review and report)

Kevin D Peacock VK4KKD

Firstly a little background on how the OzSpid found its way to Australia.

Several years ago a fellow ham contacted me about a rotator being sold in Canada. Harris (then VK4CWT) made particular mention of the style of the rotator. The drive motor was mounted externally and it had reminded him of the way I had devised an electric motor drive for the winches on my "One Man Towers".

Photo 1. The complete package. The OzSpid Heavy Duty rotator comes with control box, computer interface and software. The Spid "mouse" is an OPTIONAL EXTRA, well worth buying as it allows the control box to be set out of the way and the rotator controlled using either the direct input of clockwise/ anti-clockwise with the right and left top buttons. OR you can set up to six presets (in six memories), which can be called up using the six side buttons on the mouse body.

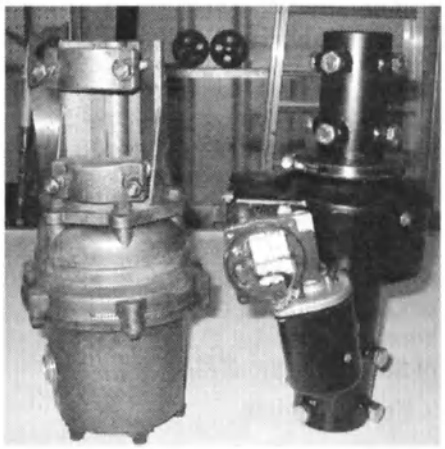


Photo 2. The working end of the OzSpid is very close in size to the working end of the Emotator 1200 FXX. That is until you come to your radio desk.

Included with his letter was a photograph of the rotator. My first impression was "ugh, how ugly!" After a cursory and half-hearted look at the unit, I thought no more about it.

That is until Bob (VK4MR) contacted me after he returned from one of his trips to the US "Hamfest" at Dayton Ohio.

Bob mentioned a rotator that he had seen being sold there. And he spoke about the way the Canadian amateurs who were selling it had set up a comprehensive test, pitting their rotator against all of the big name rotators that most of us are familiar with.

Their endeavours at Dayton are another story, one which will become part of the many legends that are the history of Ham Radio. The way their rotator performed sparked more than casual interest among those who witnessed the test.

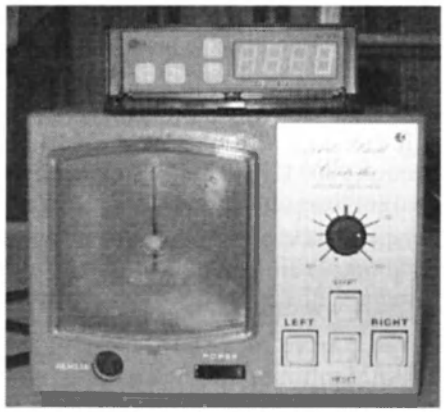


Photo 3. Here is where size does matter. The fantastic little digital readout of the OzSpid was a bit "different" at first. But within a few minutes I had become used to it and realised the advantages of such a system.

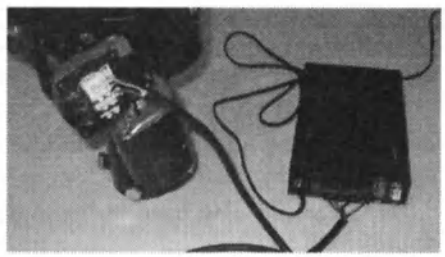


Photo 4. Connecting the unit is super simple. Only four wires are required and the units are clearly labeled. Two wires are for powering the motor and the other two are impulse carries. An operator's manual is included on the software CD and it should be printed out and read.

The glowing terms used by VK4MR were enough to set in motion a series of events which were to end with this fantastic little rotator becoming part of the inventory of Australian Enterprise Industrial.

As many would be aware, Australian Enterprise Industrial is a small business primarily producing the "One Man Tower".

This tower is an Australian

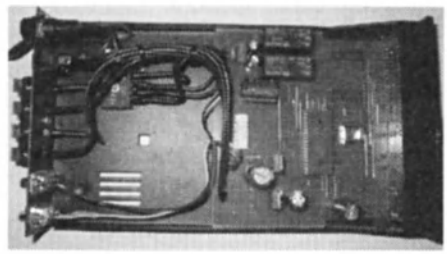


Photo 5. The inside of the control box is well laid out with plenty of room for the components. Examination showed the soldering to be of a high standard on the several randomly selected control boxes that I removed the covers from. None of the "slapped on with a shovel" soldering that I have found in some of the other brands which now seem to mostly come from the cheap labour regions where the people doing the soldering have little or no idea of just what they are supposed to be doing.

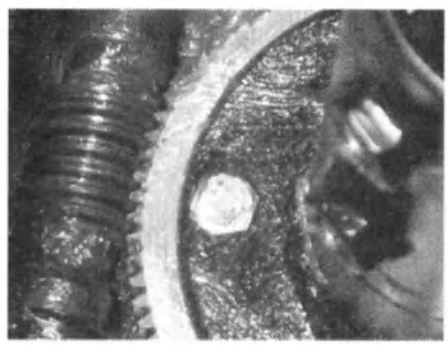


Photo 6. No puny little alloy or plastic gears in here, folks. Solid machine cut steel worm drive and pinion. The strength built in here is way beyond what other manufacturers are offering. No wonder it tips the scales at 8kgl

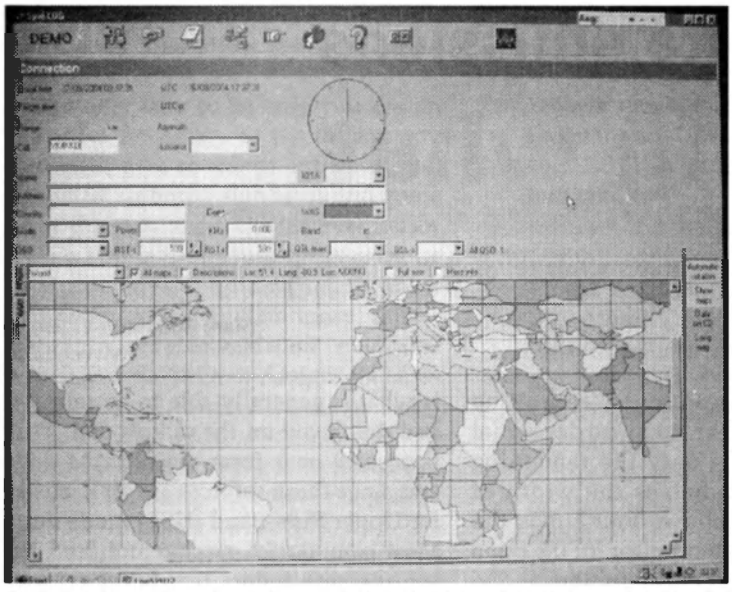


Photo 7. A screen shot of one of the displays that those who choose to remotely control their OzSpid rotator will see. A world map on which the operator simply double clicks a location and the rotator turns the antenna to that direction. There are many options available in the software. Nothing complicated. And it does not take a University degree to set it up or use.

invention which has been making hobby communications, and indeed the commercial communications industry, safe and more "user friendly" for some 20 years.

With an eye for strength, I was very impressed at the strength of this ugly little black rotator, which had made such an impression on my long time friend. But I was to soon be even more impressed.

I contacted the chaps in Canada, they referred me on to the manufacturer. Discussions led to the importation of an eagerly awaited shipment of the rotators to Australia.

I intended to give one or more of these rotators what I can only describe as "the Aussie test", I earmarked one Azimuth only unit and one Azimuth/Elevation combination unit for my test bench.

"Strewth, it's heavy for its size" was my impression on taking it out of the box (8kg - compared to say an Emotator 1200FXX which weighs 6kg and understandably as The Spid has tubes for mounting to pipes top and bottom while the Emotator had pipe clamps top only)

This is not some pot metal glitz and glamour machine. Constructed in steel with a massive steel worm gear drive, the mounting system is two steel tubes, one top and one bottom with eight centering/locking bolts in each.

It comes with neat, compact little boxes which house the electronics. I was pleasantly surprised with them, as I had become used to the large control boxes of the various other brands of rotators.

Then I discovered the CD. Never having been one to "read the flamin' instructions", I inserted the CD and installed the software. I sat there pushing buttons and waiting for things to happen. For the first time I found myself at the control of a rotator through my PC. But I have put the cart before the horse a bit here and should backtrack because it was not as simple as I made it sound.

With one rotator and a control box on the test bench I printed out the "owners manual" from the CD. And this is the first thing I should have done.

After reading the manual I saw how the designer and builder of these rotators had employed the "KISSS" principal. This endeared him to me, as it was my personal objective when I designed, and later refined, the design of the "One Man Tower". KEEP IT STRONG AND SIMPLE STUPID! Works every time.

Simple? You bet. Four wires connected control box to the rotator. The control box uses 12 V dc. You can't get much simpler than that. Or can you?

The hardest choice I had was 'how would I control the rotator?' Would I use the optional mouse? Would I direct input control using the push buttons on the control box front panel? Or would I go to remote control using my PC? Faced with such a diverse selection of control choices I was like a kid in a candy store.

Price for the OzSpid Heavy Duty rotator is just AUD$990 (inc. GST).

The optional mouse is just AUD$38.50 (inc. GST)

Where do you get it?

Contact Kev. at Australian Enterprise Industrial. (see ad this page)

Or on the internet email aeitower@ihug.com.au http://homepages.ihug.com.au/~aeitower/index

ar

Plan ahead

ALARAMEET

9th to 12th September 2005

http://users.ncable.com.au/gsyme/AlaraMeet/

2005 Wadda Cup Contest

24 September, 2005

PACTOR and other data emissions

Understanding what frequency you are on

Marc Robinson VK2BUA
www.pca.cc

Following the recent approval of PACTOR data modes for use by Australian amateur stations, it is perhaps timely to explain how to get onto the correct frequency to call say, a silently scanning Winlink station.

In the world of AM/FM radio, setting a transceiver on frequency is simply a case of: "read the frequency out of the book and dial it up on the radio." The resultant transmission sits symmetrically on the quoted radio carrier frequency and that is that. However, with Single Side-Band (SSB) mode, things get more complicated. SSB is generated by generating an AM signal with its two mirror imaged Upper and Lower Side-Band components, removing one along with the main carrier signal and transmitting only the remaining side-band. This halves the width of the signal and allows four times the effective transmitter power for the same transmitter power consumption.

While this is all very efficient, how do you tell someone what frequency you are on if you have chopped the signal in two, thrown away one or other half and killed (suppressed) the carrier it rode on? Commercial aviation, marine and like services traditionally keep it simply and quote the non existent Suppressed Carrier Frequency (SCF) when listing Voice Service Frequencies because that is what is generally able to be selected and displayed on the radio's dial. This is a carry over from the old AM days and since these services are all licensed for Upper Side-Band (USB) mode only. Most commercial marine and land HF transceivers reflect this by providing only USB mode.

On the other hand, military, CB and amateur radio services have more latitude and radios made for these services provide LSB, AM and USB mode selection which creates havoc in the hands of untrained operators. Publishing or establishing the radio frequency of a data transmission is a lot harder because the tone frequencies generated by the

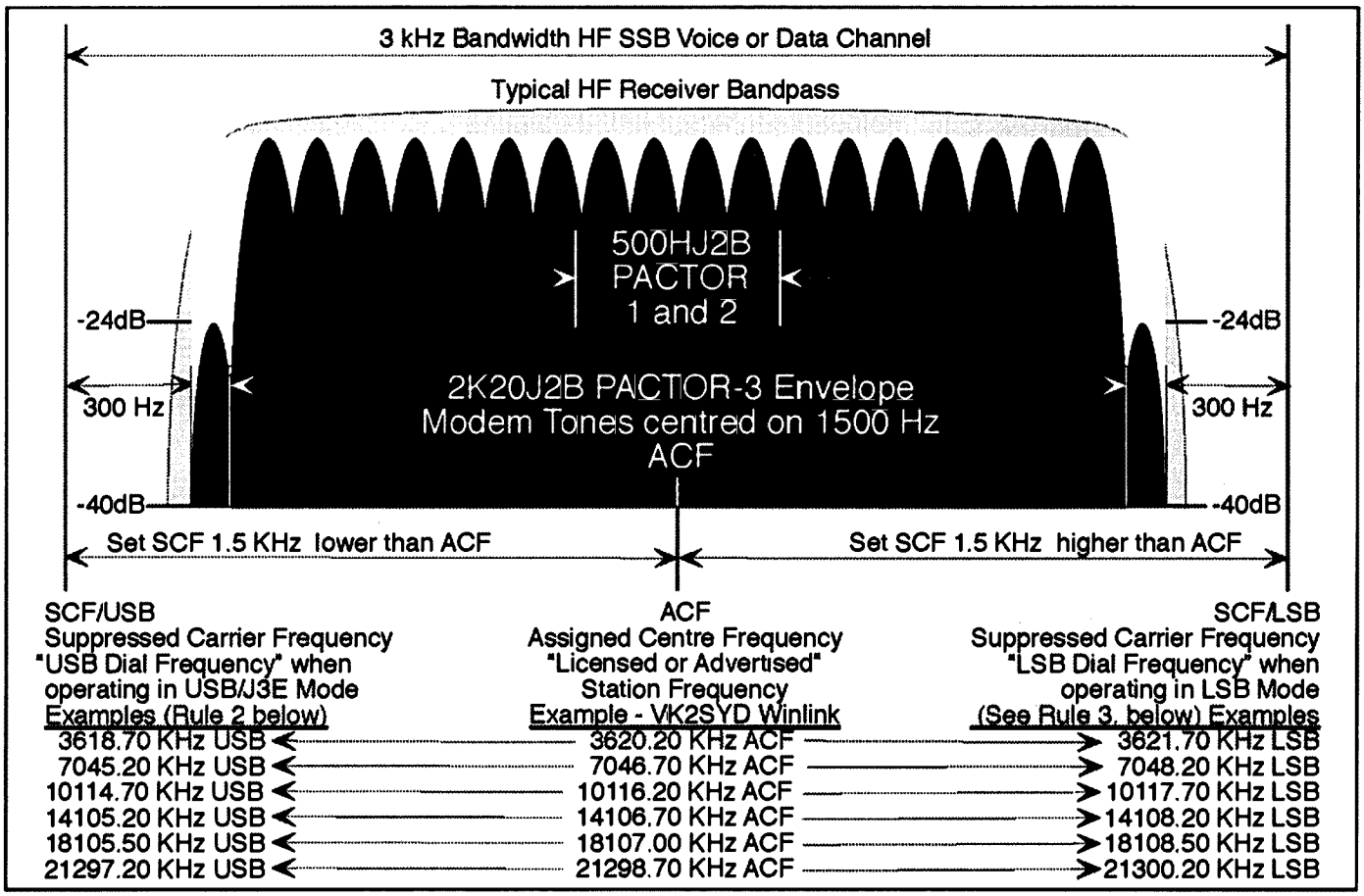


Figure 1

data modem to modulate your SSB transceiver also affect the transmitted frequency.

The only way to be sure you are on the same frequency as the station you are calling is to adopt international licensing authority standards and quote only the Assigned Centre Frequency (ACF). This is the frequency of the centre of signal envelope being transmitted. The frequency of modem tones, carrier frequency and sideband must be selected to achieve the correct Assigned Centre Frequency.

Fig 1 shows a picture of a PACTOR-3 signal envelope showing the relationship between the Assigned Centre Frequency, USB/LSB mode selection and the Suppressed Carrier Frequency that must be set. Also shown is the narrower 500 Hz bandwidth occupied when using the older and slower PACTOR-1/2 modes.

Rules for PACTOR Data Operation

1. Always use the Assigned Centre Frequency (ACF) to list or describe a PACTOR data radio channel frequency.
2. Subtract 1.5 KHz from the ACF when programming or setting the "Dial Frequency" on the Radio in USB Mode.
3. Hams can choose to add 1.5 KHz and use LSB mode if they find it easier due to their radio's default modes.
4. PTC Modem Tones must be set to centre on 1500 Hz (1.5 KHz) so receiver bandwidth accommodates signal.
5. All the above settings also work for older data modes including PACTOR 1 & 2, SITOR, AMTOR and Packet.
6. It is essential to set the PTC modem FSK & PSK levels so as not to overdrive the transmitter (another subject).

ar

A dual band CW transceiver
Part 1

Dale Hughes VK2DSH
PO Box 7430, Sutton, NSW 2620

Direct conversion receivers have been around for many years. Such receivers have the advantage of simplicity and are capable of high performance if carefully designed and constructed. Interest has re-emerged in using phasing methods instead of crystal filters to reject unwanted sidebands. Phasing methods of sideband rejection can be used at any frequency instead of a limited range of frequencies for which precision filters are available. New mixer designs have appeared that offer high performance at low cost and low noise high gain audio amplifiers are available which simplify phasing system design.

Morse code has been with us since the dawn of electrical method of communication; it has the virtue of providing reliable contacts in poor conditions. Also, simple circuits can be used to build transmitters. Modern semiconductor technology has provided us with a multitude of new devices with which we can create high performance receivers and transmitters.

All of the above make it a perfect time for us to experiment with radio technology, and this article describes the design and construction of a low power CW transceiver which has the following features:

- Frequency agility and stability by means of Direct Digital Synthesis (DDS) technology. Frequency resolution is adjustable in decade steps from 1 Hz to 10 MHz.
- Transmit output power is approximately 2.5 watts into 50 ohms. Local side tone is provided when in the transmit mode.
- Direct conversion receiver with unwanted sideband rejection.
- Ability to operate on split frequencies, and selectable receive frequency offset.
- Inbuilt keyer for use with 'bug' type keys, straight keys can also be used.
- Minimum number of controls: a keypad, display, volume control and 'Press to transmit' switch (PTT).

This article is in two parts, the first covers the overall description, digital circuitry and transmitter, the second part covers the receiver, adjustments and concluding comments.

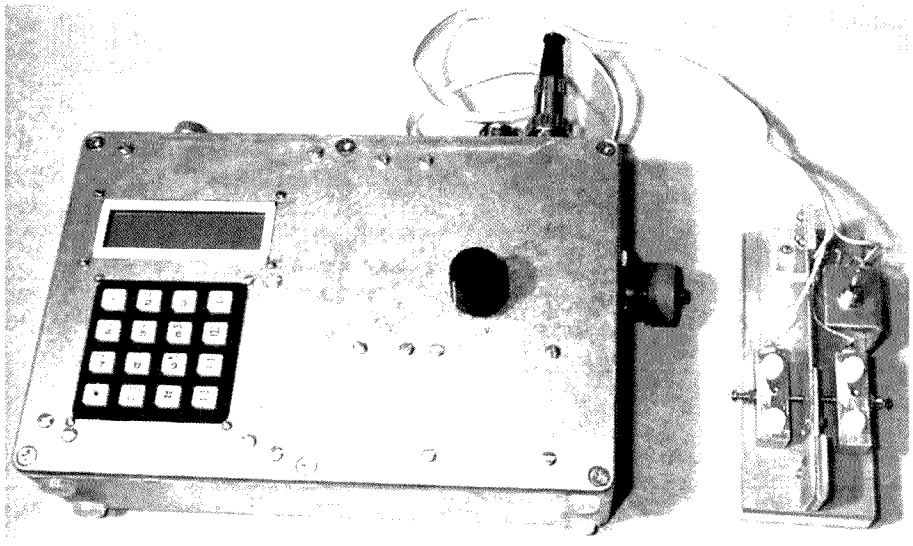


Figure 1: The transceiver and a homemade 'bug' type key which is used with the inbuilt keyer.

Circuit description

The block diagram (figure 2) shows the main parts of the unit, and how each block interconnects with the other modules. Provision has been made to allow the addition of an external power amplifier. The connections from the transmit/receive relay on the transmitter board are bought out through connectors so that the receiver input can be placed on the antenna side of an external transmitter power amplifier if required.

Not shown explicitly are the power supplies to each part of the unit. The completed unit runs from a 12 volt sealed lead acid battery. Positive and negative 5 volt supplies are generated using a pair of small DC-DC converters removed from junked equipment. Current consumption is 310 mA on receive (depending on attenuator settings) and 680 mA on transmit.

Note that, in the following descriptions, component numbering on the schematic diagrams relates to the individual modules.

CPU & DDS module

The heart of the system is the CPU & DDS module (see figure 3). This unit performs the following functions:

- Generates the RF carrier at twice the selected receive and transmit frequency.
- Controls the transmit/receive switching and transmit keying.
- Acts as the dot and dash generator when the 'bug' mode is selected.
- Controls the receiver input attenuator.
- Allows the operator to customise various aspects of the unit to suit

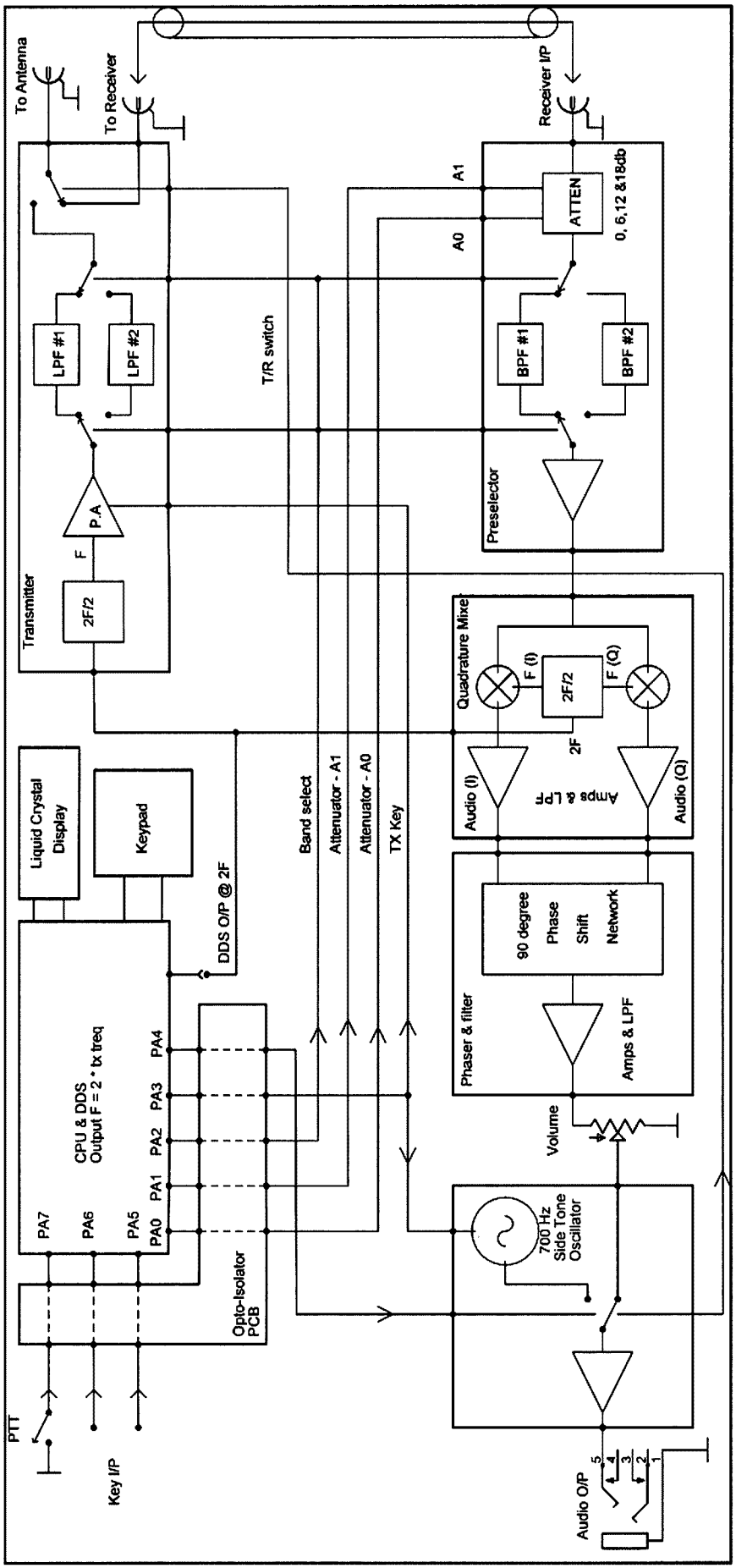


Figure 2: Block diagram of the transceiver.

individual needs.

- Sets transmit band limits to prevent inadvertent out-of-band transmissions.
- Sets the receive frequency offset to adjust the 'beat' note of the received transmission.

The CPU is an Atmel AT90S8535 device and the DDS chip is an Analog Devices AD9851 Device. The DDS chip is clocked by a 30 MHz oscillator which is multiplied internally by the DDS chip to generate a 180 MHz clock which is used to generate the RF output. A sine wave output is available from the DDS chip, but in this case the sine wave is passed through a 70 MHz low-pass filter and then squared by the internal Schmidt trigger to generate logic level signals which are passed to the transmit and receive circuits. The DDS and associated filter are all surface mounted components, thus no winding information is given for the 70 MHz filter. Note that the RF output from the DDS unit is at twice the set frequency and is divided by two on the receiver and transmitter circuit boards. This simplifies the generation of anti-phase signals that are required for the transmitter and the quadrature phase signals required by the receiver mixers.

Transmit and receive frequencies are set from the keypad and a two line liquid crystal display (LCD) shows frequency and attenuator settings when in normal use. Various options can be easily set by scrolling through options on the LCD; the most commonly required settings are shown first, followed by less frequently accessed settings.

The CPU chip has the facility to be programmed in-situ and this allows the CPU software to be upgraded as operational needs change.

All input/output lines between the CPU module and the rest of the transceiver are connected by optical isolators and are filtered to prevent noise from the high speed digital circuitry interfering with the operation of the transceiver. Particular attention must be paid to filtering, screening and supply decoupling of high speed digital circuitry to reduce the possibility of internally generated spurious signals. The prototype uses multiple layers of conductive screens and all non-RF connections are passed via feed-through capacitors. Local oscillator output from

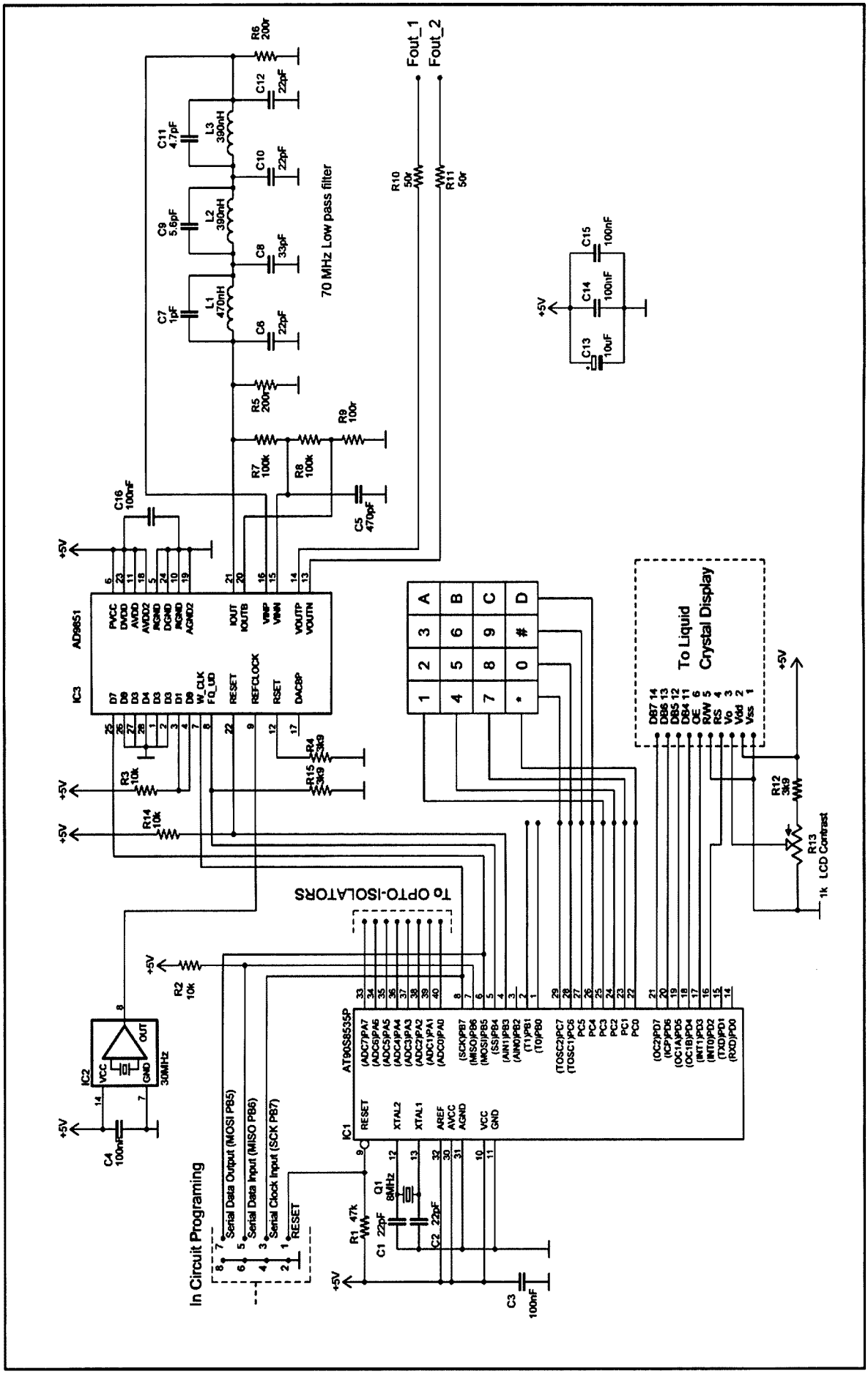


Figure 3: The CPU & DDS module.

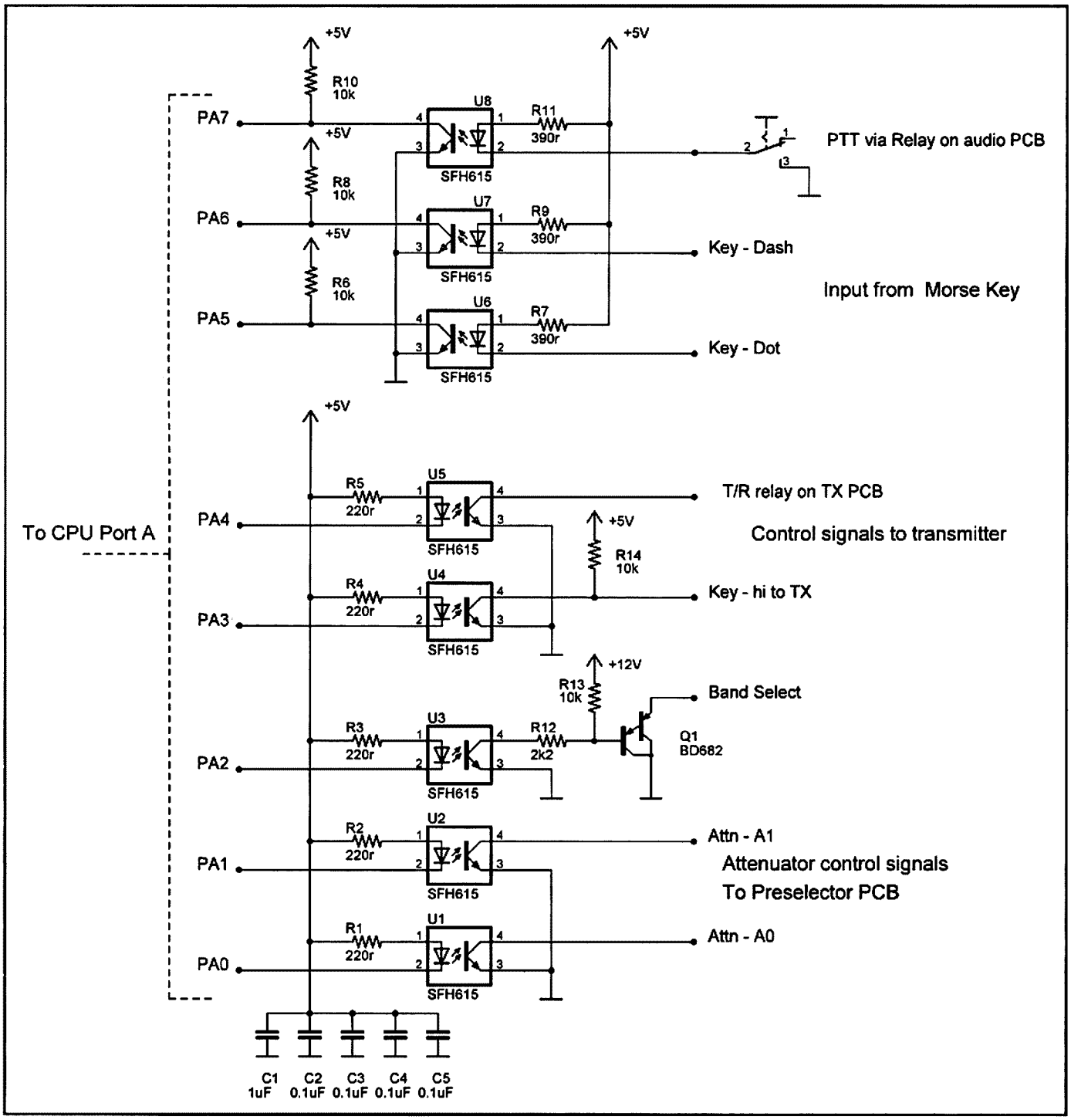


Figure 4: The optical-isolator module.

the DDS to the receiver and transmitter is via miniature coaxial cable.

The optical-isolator (figure 4) module consists of eight couplers; three accept signals from external sources (PTT, dot and dash signals) and the other five control various aspects of the units operations (attenuator, band select, TR control). Each coupler is capable of sinking 20 mA of current and Q1 boosts the ability of coupler U3 to switch the four band select relays which switch the low-pass and band-pass filters.

Transmitter details

The transmitter module includes a phase-splitter, driver, amplifier, selectable band-pass filters and the transmit/receive relay. The RF carrier at twice the transmit output frequency is supplied from the DDS and is divided by two by one half of the 74HC74 chip. The anti-phase signals are passed to a 74HC540 tri-state driver chip which supplies sufficient current to drive the bases of the BD139 transistors. Keying of the transmitter is accomplished by enabling the output of the 74HC540 driver chip. When the key is 'down', i.e. RF output is required, the driver outputs are enabled and current is supplied to the bases of the amplifier transistors. When the key is 'up' the

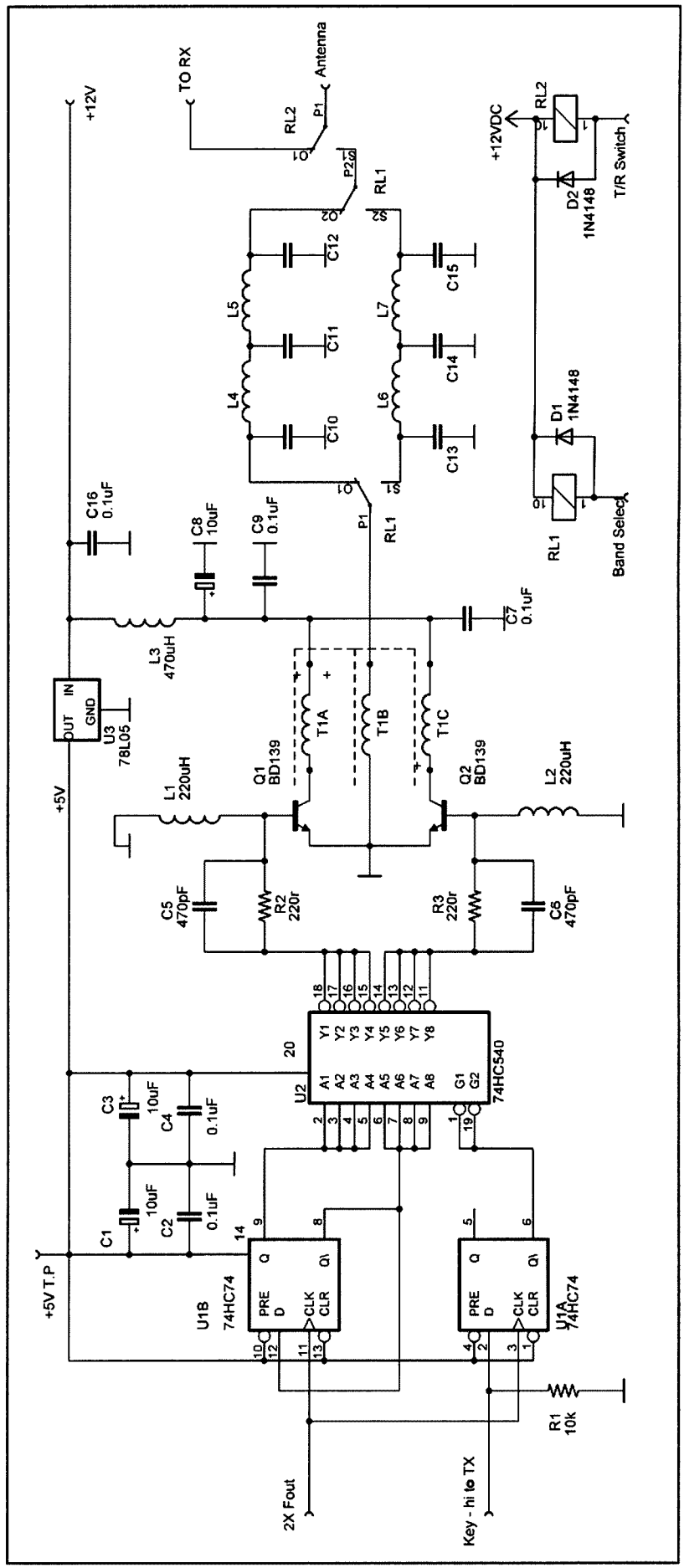


Figure 5: The transmitter module schematic diagram.

driver output is 'tri-stated' (assumes a high impedance state) and no current is fed to the transistors. The transistors are fed in push-pull and their outputs are connected through a broadband coupling transformer which provides a 50 ohm output for the following low-pass filters. The appropriate filter is selected by relays that are switched according to the transmit frequency. In the existing design, filters are provided for the 160 and 80 metre bands; table 1 shows the component values for those bands. If required, other frequencies can be installed as the DDS and transmitter are broadband.

The second half of the 74HC74 divider is used to clock the keying signal so that it is synchronous with the carrier, this reduces switching transients and out of band emissions.

The transmitter module schematic is shown in Fig 5. Output coupling transformer T1 is wound on three Amidon T50-43 ferrite cores stacked together, the primary (T1A & T1C) has five bifilar turns and the secondary (T1B) is seven turns wound adjacent to the primary. Wire size is 0.5 mm in both cases. The component values for the output low-pass filters are given in table 1.

Component	160 m Band	80 m Band
L4 & L5		2.15 µH, 23 turns T37-2 core, 0.5 mm wire
C10 & C12		860 pF
C11		1.8 nF
L6 & L7	3.98 µH, 31 turns T37-2 core, 0.4 mm wire	
C13 & C15	1.5 nF	
C14	3.3 nF	

Table 1: Low pass filter component values for the 160 and 80 m bands. The filter impedance is 50 ohms and other frequencies can be substituted if required. The ARRL handbook gives tabulated values for a wide range of cut-off frequencies. Capacitors should be good quality polystyrene or silver-mica types.

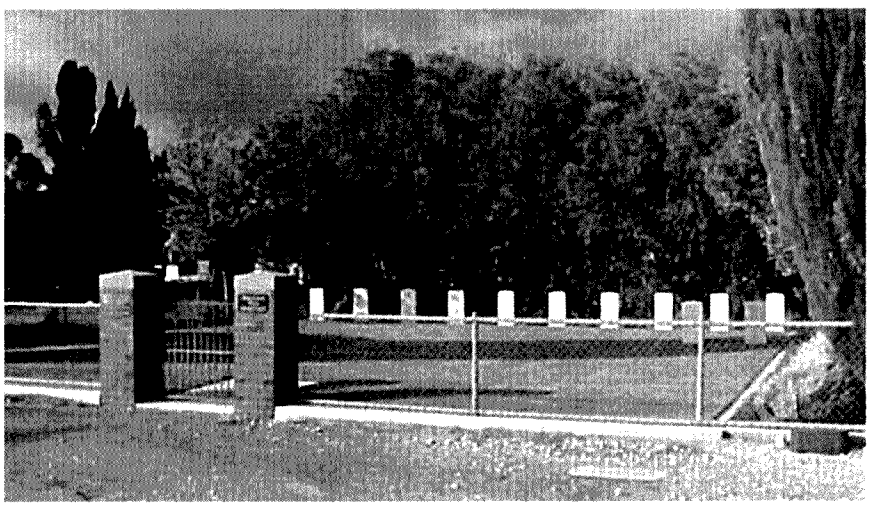
The remaining sections of the transceiver (receiver and audio modules) along with alignment details, references and component supplier information is contained in the next section of this article.

To be continued in the September issue of *Amateur Radio.*

Remembrance Day operation from Mallala War Grave Cemetery

Elizabeth ARC hope to operate in this year's RD Contest from this War Cemetery. The World War II RAAF station is now a motor racing circuit but was a RAAF training base in WWII. Accidents in training killed a number of air crew who are buried in the cemetery. They were aged between 18 and 29 years. The Office of Australian War Graves gave permission to operate beside but not inside the cemetery.

Least We Forget.



Steve Mahony VK5AIM,EARC

Using "low cost" parts in critical applications – *is it worth it?*

Felix Scerri VK4FUQ

I decided to write this article after I recently discovered a fault here in the shack that could have had very serious consequences. The cause? Well, I'm not really sure how to describe it, except to say that the use of a less than "prime spec" component in a critical application was more or less responsible.

Please allow me to elaborate. I like to do a fair bit of electronics "home brewing", nothing too complex, things like audio preamps, sundry bits of electronics, antennas of different types, simple receivers and transmitters of varying complexity and dc power wiring. By this, I mean the wiring up of the various components in a typical 12 volt system for use in the shack. Although I have commercial 240 volt power available in the shack, some years ago, I opted to go "battery", of the large "deep cycle" lead acid variety, backed up and kept charged by a single 50 watt solar panel. Over the years, the system has been expanded to include a second solar panel, and here in the shack, more complex power wiring, including regulators and switching.

I've always attempted to install and maintain all power wiring to the highest possible standards, with safety and efficiency being the two things of paramount importance. Everything has worked pretty well with minimal maintenance, and exactly as designed, until recently, when I had noticed my main batteries seemed to be more discharged than usual, despite regular charging through the solar panels. I had attributed this to recent grey skies and reduced solar panel output, as all meters and other indicators here in the shack seemed to indicate all power system components OK.

The thing that's bugging me is whether it is prudent to use anything but the very best in a critical application... where the result of failure can be catastrophic.

However, one morning I became suspicious when the charging rate appeared low despite good sunlight. Initially, I suspected a faulty battery, but this proved not to be the case when checked.

Sensing something not right, I connected my solar panels direct in to this battery using a direct bypass switch that I had installed early in the power wiring's initial installation. I immediately noted a large increase in output from the solar panels. This indicated something amiss with either the solar regulator and/or the power switching.

The original solar regulator had been replaced recently after around twelve years of faultless service, and I knew all wiring and connectors to be in good condition. I "accidentally" found the true fault when I brushed my hand against the double pole toggle changeover switch that switches the output from the regulator to either of two batteries. The switch was hot. That wasn't a good sign!

I quickly removed the switch from service after isolating all power, and replaced the switch with a high quality unit purchased from a local auto electrician. After replacing the faulty switch and monitoring things for a few days, it became obvious that the solar charging system was working better than ever in recent times, and it was apparent that the faulty switch had been failing slowly for an extended period of time, without being noticed. I had initially thrown the faulty switch away in disgust, early in the exercise, but after it had been replaced, I decided to fish it out of the bin and do some measurements. The results were most interesting. One "pole" of the toggle switch was faultless, with near zero resistance measured between contacts when switched, however the other "pole" was an entirely different story! The contact resistance, measured from the common terminal to each side of the switch, varied from zero to about 500 ohms in a highly intermittent and erratic matter.

Clearly, here was the reason for the general power loss and a "hot" switch. Apart from being an interesting fault, this experience raises several questions, some of which are potentially very serious indeed. I guess the main question involves "quality" and "cost". I had purchased the switch from one of the well known electronics parts suppliers who have an excellent general reputation for parts quality. The switch itself was quite inexpensive, but was adequately rated for both voltage and current, and indeed for a month or so, it was fine. That faulty switch had actually been a replacement for an earlier switch that was itself replaced on suspicion of being faulty, having a loose "actuator", but was operationally ok.

I guess the thing that's really bugging me is whether it is prudent to use anything but the very best in a critical application such as power wiring and switching, where the result of failure can be catastrophic. The feeling of a "hot" switch is something not easily forgotten! The fact that the switch was fully acceptable and workable for a period of time, adds an element of vagueness and uncertainty to the general equation. I have since pulled apart the faulty switch for examination and found a pretty basic but workable switch, although it bears all the signs of being a less than "prime spec" design. Then again, the switch was inexpensive when it was purchased. Was it built to a price and an appropriate level of quality? Was it designed for long term reliability and longevity? The switch I have since installed as a replacement is much more expensive and appears to be of excellent quality.

Will it last and be reliable in the long term? I guess time will tell. I hope that it will, as the "bypass" switch I mentioned earlier, is of the same design and was purchased from the same auto electrician, and its operation has been faultless and quite impeccable over quite a few years. In the end, perhaps it's a case of "caveat emptor".

ar

Peter Gibson VK3AZL

A backpacker's delight – the folding J-pole

In QST for March 2005, Michael Heiler, KA0ZLG describes a foldable copper J-Pole antenna for 144MHz.

The antenna is constructed from a 10 foot length of ½ inch copper tubing plus a selection of suitable fittings. The final assembly and how it goes together is shown in Figure 1. You will first need to cut five 19¼ inch sections and one 2¾ inch section from the 10 foot length of ½ inch tube

Soldering the pipe joints is the next step. When soldering copper pipe, you will need to clean the area to be soldered. Sanding or even use of a scouring pad will do the job. Solder paste/flux should be applied to the joint ends to ensure a good joint. Solder a straight coupling to one end of two of the long pipe sections

Next, attach two brass nuts to each of the eyebolts and tighten them against each other. Place the eyebolt assemblies inside two of the copper end caps and solder them in place using a propane torch. Fill the end caps with solder to cover the brass nuts. Make sure you use brass nuts as they solder better than steel.

When this is done, lay out all the pieces as per Figure 1 as if they were joined. This helps avoid mistakes when assembling it all. Make sure the two sections already soldered have the fittings facing down so it doesn't fill with rainwater. Next solder one long section to one end of the T coupling and one to one side of the right angle coupling. On the other side of the right angle, solder the 2¾ inch section. The other end of the 2¾ inch section is soldered to the T part of the T coupling. Figures 1, 2 and 3 show how things go together.

Now all the pieces are assembled, you need to tie a large enough knot in one end of the bungee cord so it won't pull through an eyebolt. Run the bungee cord through the top eyebolt, through the other pieces of copper pipe and out the support section as per Figure 1. With all sections fitted tightly and the top cap fitted on, pull the bungee cord tight. Then run it through the other eyebolt at the lower end, tie a knot in it, stuff it back into the pipe and place the cap on the pipe. Do not solder the caps onto the pipes, only push them on.

For the feedpoint support, use a piece of plexiglass, cut to 2¾ inches square. Drill a ½ inch hole in the centre and mount the SO-239 (or other type) connector as per Figure 2. Add the

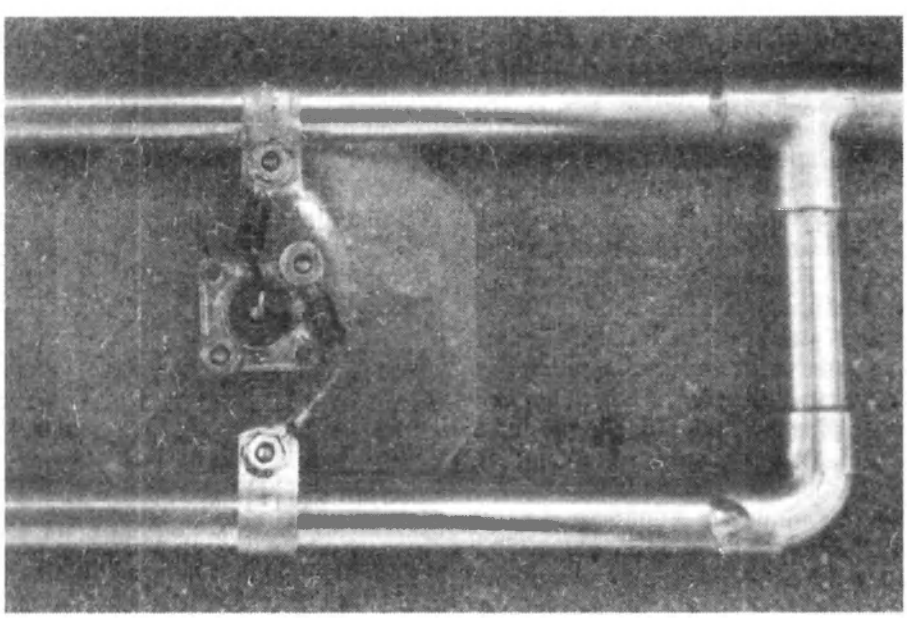


Figure 2. The antenna feed point assembly

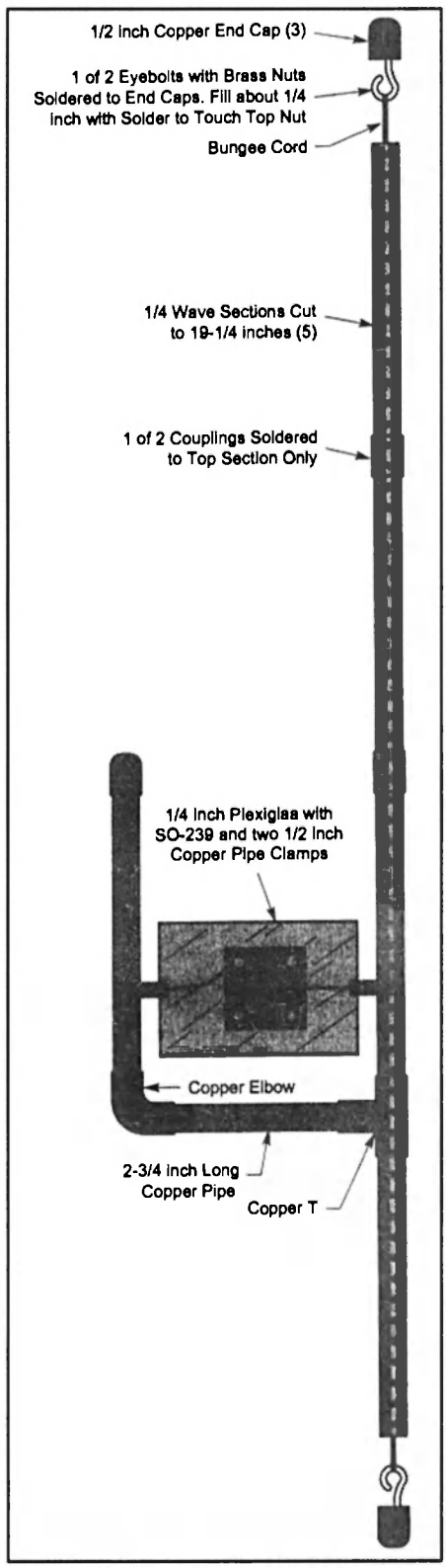


Figure 1. The assembly drawing for the VHF/UHF folding J-pole antenna

copper pipe (saddle) clamps to either side of the plexiglass by bending them around the pipes and bolt them on. Make sure all surfaces are sanded clean. Use two short lengths of stranded wire with terminals soldered onto each end to join the connector to the pipes as per Figure 2.

Once the antenna is assembled it needs to be tuned for minimum VSWR. Start with both pipe clamps about 3 inches up from the bottom of the radiator and matching stub and work down from there. You will need to tighten the clamps reasonably well so you get a reliable RF analyzer reading when testing. The VSWR was 1:1 at 146.6MHz on the unit described. Note that the SO-239 (or similar) connector is not waterproof so some provision must be made to waterproof it.

When the antenna is mounted in a typical operating position, recheck the VSWR to see if it has changed. If it has, you will have to adjust it again as surrounding objects can affect it.

The complete antenna as packed for carriage is shown in Figure 4. Note that the two hose clamps are used to hold everything together in the carry bag, but could be used for mounting as well.

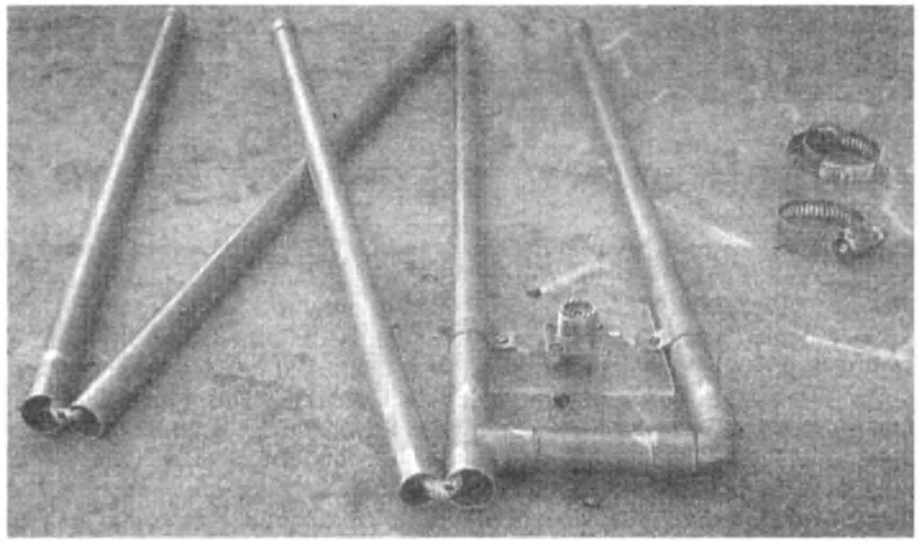


Figure 3. The J-pole in the process of being 'folded'

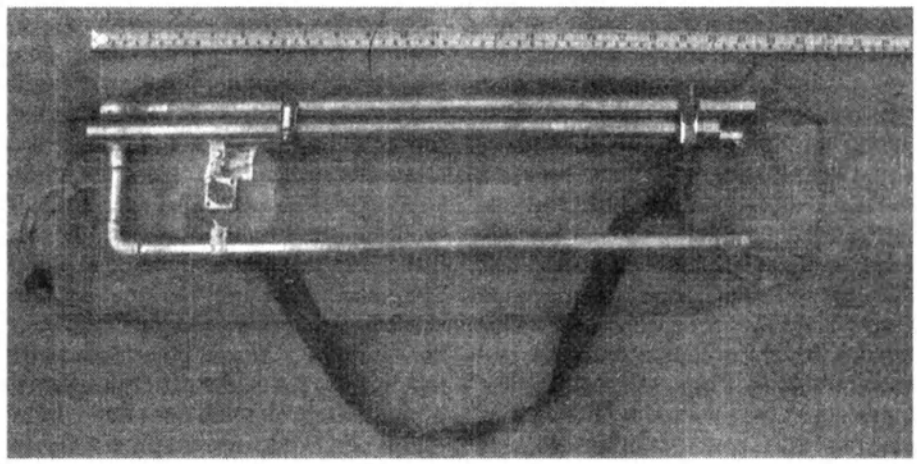


Figure 4. The completed folding J-pole, ready for packing

Nylon washers as VHF toroids

In the Technical Topics section of RadCom for April 2005, Gary Aylward, G0XAN has found a technique for winding low inductance toroids on Nylon washers in an issue of Electronic Design from 2001.

When inductance values are smaller than 1µH, air cores with unity relative permeability can be used instead of powdered-iron or ferrite cores. For wire size thinner than 20AWG, a coil former is often needed for mechanical support. Nylon 6/6 standard flat washers are usable as low cost coil forms. The nominal electrical parameters are a dielectric constant of 3.6, a dissipation factor of 0.04 and a dielectric strength of 385V/mil.

Winding data based on two standard (American) sizes of nylon washers are given in Table 1. Some typical toroidal inductors were wound and tested and the results are shown in Table 2. The maximum inductances were obtained with the windings squeezed and minimum with the windings spread. Inductance values were calculated from measured resonant frequencies using a known capacitor. As the winding area is filled, the adjustability of the inductors decreases and there are limitations on the number of turns that can be applied as a single layer winding. It is claimed that, despite its dielectric constant and dissipation factor, the quality of nylon toroidal inductors is quite good with typical unloaded Qs in the range of 75 to 125, more than adequate for most low-pass and high-pass filters in the range of 30 to 100MHz. They provide small size, efficiency and some adjustability. With a 0.250in diameter washer, maximum turns (22AWG) are six and for 0.375in, 15. With 26AWG, maximum turns are 15 and 30 for the same diameters.

Table 1: Nylon Washer Dimensions

Screw clearance	Outer Diameter (In)	Inner Diameter (in)	Thickness (in)
Number 4	0.250in	0.115in	0.125in
Number 10	0.375in	0.194in	0.125in

Table 2: Inductance windings and measured values

Toroid Dia (In)	Inductor winding	Max L InH)	Min L (nHI
0.250in	7T/26AWG	116	86
0.375in	7T/22AWG	113	86

ar

A century for a gentleman radio amateur

Jim Linton VK3PC

Friends and admirers gathered to pay tribute to a remarkable individual, Alf Chandler VK3LC, on the occasion of his 100th birthday.

The party was held a day prior to his actual birthday of 1 June, in the Moorabbin and District Radio Club rooms. Distinguished guests were the Mayor of Kingston, Cr Topsy Petchey, WIA President Michael Owen and Amateur Radio Victoria President Jim Linton. Also present were local members of the Victorian and Federal parliaments.

The local newspaper and Channel 9 interviewed Alf at the club's station. He chatted on air and also pounded brass to tap out the words 'happy birthday'. The television news item was seen throughout Victoria and interstate.

To begin the formalities, Moorabbin Club President Ken Morgan VK3CEK read numerous congratulatory messages. The Old Old Timers Club of New York provided a special 80-year membership certificate. The Radio Old Timers Club of Australia, of which Alf is a Life member, warmly acknowledged his loyal involvement.

In recognition of his contributions to amateur radio and the Wireless Institute of Australia, Alf was presented with Honorary Life Membership Certificates from the WIA and Amateur Radio Victoria.

His contributions to the WIA included (1963-1970) membership of the WIA Publications Committee, (from 1967) WIA Intruder Watch Coordinator, first for WIA Victoria, then WIA Federal, and (1975-1982) as Coordinator for the International Amateur Radio Union Region 3.

In 1978 Alf received the WIA Ron Wilkinson Achievement Award in recognition of outstanding achievement "In the field of intruder watch activities", was presented a Silver Medallion for Meritorious Service to WIA Victoria in 1983. In 1984, WIA Federal gave Alf a silver plaque for contribution to the IARU Region 3.

Kingston Mayor Cr Topsy Petchey joins Alf Chandler VK3LC on air.

In a speech about the occasion of reaching 100 years, WIA President Michael VK3KI talked of relativity between Alf's life and the history of radio.

"We honour a friend whose life-long interest has been in radio. Today when radio is so taken for granted it's extraordinary to remember how short is the history of radio," he said.

"It was less than four years before Alf was born that on December 12, 1901, Marconi made the first trans-Atlantic communication without wires."

In 1920 as a 15 year old school student Alf built a crystal set to receive wireless signals from ships, and later the first broadcasting stations in Melbourne.

Picking up on that topic, Amateur Radio Victoria President, Jim VK3PC detailed Alf Chandler's 81-years in radio. These included graduating from the Marconi School in Queen Street Melbourne in 1925 and then being employed at 'Crystal Clear Radio' as a wireless set maintenance employee and salesman.

In 1926 Alf took out an amateur licence A3WH later OA3WH and set up a station at his then home in Beaumaris in Melbourne's south.

At that time there were two amateur wireless groups in Victoria, New South Wales and Queensland. Alf became the Communication Manager for the Victoria Radio Transmitter League. He helped resolve the differences between the Wireless Institute in Victoria and the League, and the latter was absorbed into the Institute.

His Marconi training stood him in good stead when he enlisted in 1940 in the Royal Australian Airforce in the mustering of wireless operators to be posted to many parts of Australia. In 1942 he lost his Beaumaris home after it was engulfed by a scrub fire.

After the war he resumed his amateur radio interest under the callsign VK3LC joining the Moorabbin and District Radio Club in 1959, being its Secretary (1960-63 and 1984-88) and elevated to Life Member in 1992.

His highlights of being a radio amateur

include the Las Balsas Raft Expedition that was adrift for 185 days from Guayaquil, Ecuador, South America to Australia. (Details of the then proposed trip were reported in Amateur Radio magazine, January 1971).

Amateur radio was an essential part in the success of the expedition maintaining communications, even when authorities denied the possibility of it reaching Australia. Alf VK3LC was one of a number, including members of the Summerland Amateur Radio Club, who maintained contact.

On Wednesday, 21 November 1973, the 12 crew of the expedition landed at Ballina, northern New South Wales, and Alf traveled to meet them.

The Summerland ARC struck the La Balsa Award in 1985 and launched it in Amateur Radio magazine in November of that year. It marked the occasion of Alf's 100th birthday by issuing him an honorary La Balsa Award.

Another element of particular note in Alf's amateur radio career was his consistent on air contact with King Hussein of Jordan whose callsign was JY1. The two struck up a particularly strong friendship.

During an official visit to Australia in October 1976, King Hussein took time out to catch-up with his radio amateur friend at his home. The King enjoyed the hospitality so much he invited Alf to accompany him to the Royal palace, which he did.

Listening intently as the details of Alf's 81-years in radio were given was Kingston Mayor, Cr Topsy Petchy, who had the role of initiating a toast to Alf.

"Many people do not realise that amateur radio is far more than a hobby", she said. "Flood, earthquake, fire and even in the remote possible of terrorist attack, radio operators become indispensable front line personnel."

Cr Petchy said, "So when we raise our glasses here today to salute Alf and his wife Elyse, it should be noted that today you are also saluting yourselves for the work that you do so well over the course of every single year."

She presented Alf with a certificate of congratulations from the City of Kingston on the occasion of 100th birthday. "This certificate comes on behalf of the council and a very grateful community of Kingston."

Taking all of this in his stride, Alf responded saying it was all quite a surprise to find so many of his old friends attending for the occasion.

This gentleman of amateur radio thanked all who attended and sent good wishes, and then cut a 100th birthday cake, posing for photographs taken as a record of the occasion by many who admire and are inspired by him.

ar

Note from the author. *This article corrects some historical references previously reported in Amateur Radio magazine and elsewhere about the life of Alf Chandler VK3LC.*

Editors note: *It was the "Las Balsas Raft Expedition" while the award is singular "La Balsa Award".*

Silent key

Geoff VK5TY

(written for the ALARA newsletter by Marilyn VK3DMS)

We were all saddened to hear of the passing of Geoff Taylor VK5TY, OM of our much loved member Christine VK5CTY.

Geoff has always been a staunch supporter of ALARA, and a wonderful ambassador for amateur radio over a great many years.

He was a great personal friend who always had a quick quip and a hug, and it was a joy to be with him. My OM Geoff and I spent many happy Easters with Geoff and Christine at their Swan Reach bush shack. There was always some sort of project for the men, while we ladies did our thing, often being rubbished for that by Geoff. The evenings were most often spent playing UNO, and the competition was always fiercely funny.

I am sure that every member of ALARA will join with me to support Christine as she starts a different path in life. ALARA has lost a very good friend.

Dot VK2DB
ALARA Editor

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: **★ $ 75 for full members (F grade), ★ $ 70 for pensioners and students (G and S grade), and $ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

Home brew –
the satisfaction of "rolling your own"

David A Pilley VK2AYD
davpil@midcoast.com.au

Today so many radio amateurs are what is colloquially known at "appliance operators". Nothing wrong in this; they are the backbone of today's amateur radio hobby. There are those that just like operating and those that like "rolling their own"!

At the ORARC Field Day held at Port Macquarie this year, there was an excellent display of "Home brew" exhibits and to me personally, one of the finest I've seen. Much of the kudos must go to John Marriott, VK2CIF and Mark Swannack, VK2HMJ. Their presentation of handiwork ranged from an exotic Crystal Set to multi-band HF receivers. Both John and Mark said they were inspired by much of the well known designs created by Drew Diamond VK3XU whose designs have appeared in "Amateur Radio" over the years. Not only was the equipment excellent, but each was complete with a handbook of the construction used. I asked John about circuit boards and when he explained the simple way he made his own, I decided to try my own hand and this will be the subject of another article.

Everything you see in the photograph was home constructed. That's Mark on the left and John on the right.

Equipment left to right on the table is:

TCF40 40 metre Transceiver
CW Stacker/combo
TCF80 80 metre Transceiver
TCF 40 40 metre Transceiver
8 Amp Power Supply
ATU Transmatch and Twin SWR meter
40 watt Amplifier
3 Band Receiver
Equipment on top:
Crystal Set
Frequency Counter
CW Decoder
Twin SWR Meter
3 Band Receiver
Electronic Keyer
Portable RF Resistance Measuring Set

You may wonder what the item with the big knob is in the right hand corner of the photo. It was quite the talking point. Have you ever had the problem of holding components on a printed circuit board while you soldered them? This unique device is the solution. Simply made with wood and a some ingenuity!

A truly remarkable collection of items that was the outcome of hours of meticulous handiwork. An inspiration to the "do-it-yourself" enthusiasts, and they would be delighted to share their construction knowledge with anyone interested in home brewing. Check the Callbook for their addresses.

ar

AGM

After the 2005 ALARA AGM the following YLs are the new Committee.

Office bearers:

President:	Susan VK7LUV
First Vice-President:	Marilyn VK3DMS
Second Vice-President:	Bev VK6DE
Secretary and Treasurer:	Margaret VK4AOE
Historian and Librarian:	Shirley VK5JSH
Minute Secretary:	Bron VK3DYF
Publicity Officer:	Christine VK5CTY
Sponsorship Secretary:	Maria VK5BMT
Souvenir Custodian:	Margaret VK4AOE
Awards Custodian:	Kathy VK3XBA
Editor:	Dot VK2DB

State representatives:

VK1/2	Dot VK2DB
VK3	Bron VK3DYF
VK4	Dawn VK4HER
VK5/8	Jean VK5TSX
VK6	Bev VK6DE
VK7	Rosanne VK7NAW

Silent keys

Two of our ALARA members became Silent Keys earlier this year.

Lorrie VK3AGO had been an ALARA member for 26 years after joining in 1979.

After marrying and moving to Australia from the USA, she gained her radio licence and was able to communicate with her parents by radio.

For 37 years, Lorrie took the world of puppetry to legions of Victorian school children through the Gardner Puppet Theatre which she established in 1967.

Her last performance was in October last year at her grandson's kindergarten.

Lorrie passed away at Easter.

Margaret ex VK3DML joined ALARA in 1977 and held many positions on ALARA's Committee during the '80s and '90s.

She coordinated the Castlemaine ALARAmeet in 1993 and took us to places that we wouldn't have known about had we been just travelling through.

Margaret was interviewed for newspaper items and, in 1985 for an article in New Idea. Her words interested a lot of ladies who had never thought of radio as a hobby for ladies.

Both ladies will be sadly missed by the members of ALARA.

ALARAmeet

Many of ALARA's sponsored YLs come to ALARAmeet. We always have a group of YLs and OMs from New Zealand to our ALARAmeets and we do enjoy their company. Ngaire ZL2UJT is coming over to her first Alarameet arriving in Melbourne and travelling over slowly to Mildura, stopping at some of the great spots on the way. She is hoping to do some sight seeing in Melbourne, going for a ride in a train etc (I love trains).

She has just recently returned from a couple of days on Mana Island which is an island off the coast from Wellington. She went over there with the Conservation Department people to release a colony of her captive bred Lizards. It's been a dream of hers for many years to be able to release her Geckos in the wild to preserve the species. Mana Island is a predator free Island and hopefully as Ngaire's females were pregnant, they will help expand the small colony already there.

If there is anyone who is planning to attend ALARAmeet and hasn't booked in yet, you are leaving it very late but

Ngaire ZL2UJT with some loved friends

I'm sure there will still be room for you. Contact Marilyn VK3DMS QTHR the callbook or at vk3dms@wia.org.au

The Contest

25th ALARA CONTEST

Celebrating 30 years since the founding of ALARA with special points for contacts with original ALARA members

STARTS: Saturday 27th August 2005 at 0600 hours UTC

ENDS: Sunday 28th August 2005 at 1159 hours UTC

A special for this year only:

CONTACTS WITH ALARA MEMBERS WHO JOINED PRIOR TO 1980 - Multiply your points by 3.

After you have taken part in the ALARA Contest, send your log to the Contest Manager, Marilyn VK3DMS by mail QTHR or email alaracontest@wia.org.au

It must reach her by 31st October 2005.

ar

News from...

VK2

The Blue Mountains Radio Club Winterfest

The Blue Mountains Amateur Radio Club will be holding WINTERFEST on Saturday August 27 2005 at the 1st Blaxland Scout Hall, Reading Street, Glenbrook NSW.

Last year was a very successful event with over 100 attendees, including sellers. This year there will be an even larger number of sellers attending, including VK Cables, Action Communications (an authorised Benelec Dealer) and the Amateur Radio NSW Bookshop. Nepean Amateur Radio Group and Chifley Amateur Radio Club will also be attending. There will be a large number of private sellers participating in the car boot sale, which proved very popular last year.

Gates open to buyers at 12:00 noon. Sellers should arrive at 11:00 am to setup. There will be a $5.00 charge for sellers. Entry for buyers/visitors is by gold coin donation at the gate. Free tea and coffee will be available to all attendees.

So come along and join in all the fun and bargains on offer, and all the fresh mountain air, at this year's WINTERFEST.

John Watt VK2QN
Publicity Officer
on behalf of the Blue Mountains Amateur Radio Club Inc

Silent Key

David Moss VK2UDM of Blaxland. Passed away 11/7/05
Notified by Dava Horsfall VK2KFU (WICEN)

VK3

Geelong Radio and Elctronics Society (GRES)

The 3 months from April to June has again provided an interesting syllabus for members. In early April we were visited by members of the Ballarat Amateur Radio Group (BARG). They arrived by bus and we gave them a short history of amateur radio in Geelong. This was followed by supper and a tour of our clubrooms.

There were 4 guest speakers over the 3 month period. Phil Hapgood VK3ATI operates his own business in Geelong. He supplies and installs renewable energy systems. Phil explained to us lesser known facts about solar and wind power. These included correct installation of solar panels, types of batteries etc.

Another interesting talk was given by Bill Husin VK3YHT. His topic was cavity resonators. Bill has been employed installing and maintaining radio communication systems. He not only talked about cavity filters but also described how modern commercial systems are installed. He emphasised that for commercial use, the radio is the least expensive item. The ancillary equipment that must be used for signal isolation etc. is the more expensive items. It brought home the point that, compared to commercial installations amateur stations are quite simplistic. Two other interesting talks were given to members. These were the latest methods for homebrew printed circuit boards and digital photography.

In addition to the Thursday evening meetings, the clubrooms are open every Wednesday. Over the last 3 months a great deal has been accomplished. Many items such as defunct computers, VCRs etc. have been stripped for useable components and scrap metal. Over 900 kg of scrap metal was sold to metal recyclers. Also our library has been put in order. We have over 3000 books and magazines available for borrowing by members.

The Wednesday meeting is not confined to work on club projects. It also gives members a chance to use the workshop facilities, or to get help with a homebrew project that is not working correctly.

Our committee has drawn up a syllabus for the remaining 6 months of this year. Again the syllabus should not only be entertaining, but also most informative for our members.

Rod Green VK3AYQ

VK4

From Alistair Elrick VK4MV

Central Highlands

The Central Highlands Amateur Radio Club Annual General Meeting, happens at Camp Fairbairn, Emerald from 5 pm Friday September 30 until 10 am Sunday October 2nd. Conditions of entry can be requested from Club Secretary Gordon on (07) 4985 4168

Gold Coast ARS

Jim, Roddie, Bob, John (VK4HFE), and myself went up to Springbrook to try out a few changes to the .950 repeater to try and get to the bottom of the annoying intermittent crackling that has plagued the repeater for some time now. Firstly we put up a temporary 'water pipe' mast and J-pole antenna built by Jim in place of the original repeater's antenna, this was to try and prove if the antenna and /or feedline was causing the crackling. We added a 12 V fan inside the repeater's case, and a small row of 'rope light' to warm up the inside of the case to try and prevent condensation and circulate the air in there a bit. There has in the past been quite a bit of condensation appearing in the casing from time to time. We added some draught excluding tape all around the inside of the case door and blocked off some of the vents in the casing that were allowing water entry under heavy rainfall. That's about it for now until the crackling either returns or stays away and we will then look into the antenna and feedline further. Jim may remember more or want to comment also. Regards, Raff

Townsville. The TARC

Sunday 10th July, saw the running of the Strand Mini Swim No.2, immediately following QNEWS. WICEN Operators assembled at Picnic Bay Surf Lifesaving Club from 9 am and were in position around the 3.5 km course ready to track swimmers and provide the logistic communications support necessary to make this popular event run smoothly.

There was a good turn-up to the Ladies Group Coffee-Meet held on the previous Sunday, a bit of catching up was done and the excursion to the Heritage Tea Rooms at Herveys Range also discussed. That will occur on the 7th of August.

Look out for the Monday Nights that are for the Ann Renton Memorial Ladies Net on the Townsville VHF Repeater. The Net starts at 7 pm and all YLs, XYLs, OMs and XOMs, either licensed or acting as a second operator, are welcome to participate!

Then there are the Tuesday Night TARC Project Nights, happening from 7.30 pm at the Club Rooms, SES HQ, Green Street West End. Bring that pesky problem along, or just come along to give some help, or just come along to watch and learn!

VK4 Area Radio Scouting

http://www.scouts.com.au/international/jotafront.html

VK4 Enquires to:- Dr Paul Rollason, International Commissioner, QLD bc.international@qldhq.scouts.com.au

Jim Wagner finnwags@bigpond.com.au from GLASSHOUSE MOUNTAINS CUB PACK is hoping for a club or operators in his area so as he can go JOTA-ing this year. PLEASE contact via the email address.

VK4 Contesters

Please note this new correct email address for VK4AJS Jack Files Contest Manager:- vk4ajs67@optusnet.com.au And new postal address -26 Kerr Street North Rockhampton 4701 Cheers John VK4AJS.

The QNews Work Bench - the nuts and volts report -

(Measure twice - Cut once!)

Micro Size Repeater Controller From NHRC

Repeater operators. This one is for you. Look for a new and tiny sized repeater controller coming soon from NHRC Repeater Controllers, LLC. This controller is described as revolutionary in that three units reportedly fit on approximately the surface area of a business card. Tiny yes, but powerful. According to Kevin Custer, W3KKC, writing on Repeater - Builder Dot Com, this controller, when officially released, will be capable of at least 3 modes of operation. Those being a complete Repeater Controller, an I'Der and a Beacon Controller. All user settings will be programmable either over the air" or via the on board serial port and Windows compatible software. Kevin says he has also heard that NHRC is considering building an adaptor board to allow the unit to be mounted into the GE MASTR-II radio set. He adds to keep an eye on www.nhrc.net for more information in the very near future.

VK5

News from the Valley

The Barossa Amateur Radio Club held its AGM on Wednesday July 6th , which was well attended. The outgoing committee were thanked for their efforts and fresh elections held, with outcome being,

President: Ian VK5AIC,
Vice President: John VK5PO,
Secretary: Brian VK5UBC,
Treasurer: Norm VK5ZAH,
Publicity Officer: Richard VK5USB,
Committee: Bronte VK5AY, Steve VK5ST, Peter VK5AWP, and Peter VK5ZLX.

Congratulations all. The next major event for the club will be the activation of the Corny Point Lighthouse as VI5CP on the weekend of 20th and 21st of August. Special QSL cards are being printed and they would like to make as many contacts as possible.

The club will be once again be assisting WICEN with TOYOTA Rally of SA, and the August 3rd general meeting will be held at Brian VK5UBC's QTH with the main activity being preparation and final planning for the lighthouse trip.

73s, Richard VK5USB
Publicity Officer BARC.

News from

VK7

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au, Regional Web Site: reast.asn.au

BPL in VK7 – Aurora Energy's 2nd Trial

The start of the trial is a moving feast however, the latest is a start this month and what appears to be the infrastructure for BPL is appearing on power poles around Hobart. The mobile field strength team has been taking background readings and is ready for the start of the trial. A VK7 BPL Watch web page has been established on the Regional website and is regularly updated as information comes to hand.

Congratulations

Congratulations to Vince Henderson, VK7VH and Dave O'Brien, VK7KDO in the recent Trans-Tasman 80m contest. Vince came 3rd in the phone section and Dave came second in the QRP Phone section. Other notable VK7 entries were from NTARC, VK7TAZ, Hayden, VK7HAY, and Roger, VK7XRN.

VK7WI Callback Statistics

The VK7WI callback stats for the first half of 2005 have been published on the regional website and it's great to see an overall increase in the numbers of listeners from an average callback number of 70.7 in 2004 to 81.3 in the first half of 2005. The increases can be attributed to VK7RHT, VK7RNW 6 metre, VK7RMD and UHF CB, well done to all those who contributed to this increase. We also set a record in this period with a peak of 100 callins across VK7 on 10 April 2005. That's just over 20% of the total of almost 500 licensed amateurs in VK7. Keep up the great work!

GippsTech and VK7 Sessions!

The weekend of the 9 & 10 July was GippsTech 2005 and it was great to see two VK7 amateurs providing three sessions during the proceedings. Rex, VK7MO gave two sessions on Calculating Troposcatter Losses and High Stability Crystal Ovens and Joe, VK7JG gave a talk on the modification of the FT847 to eliminate frequency drift.

Winston Churchill Fellowship awarded to VK7 amateur

A Churchill fellowship has been awarded to Mike Harris (VK7ACQ, G0HOC, KB2SED) for a study of complimentary use of HF and Internet technologies in the US and UK. The main objective of Mike's study will be to produce an educative report providing broad evidence, experiences and information on these activities. Its aim will be to convey a range of activities in which amateurs can be involved particularly those that help serve and support wider communities. Congrats Mike.

Central Highlands Amateur Radio Club of Tasmania

A quick reminder to put the Wadda Cup contest in your diary – 24th September 2005. See last month's AR mag for details.

North West Tasmania Amateur Radio Interest Group

NWTARIG congratulates Matthew Ralston and Keith Winkler for success at recent Novice examinations and Vernon French for achieving his full call (VK7TVF).

Club Station VK7NW is the originating station for both Spectrum Newscasts on Monday nights and Spectrum Extra on

Skipper Leigh deomonstrating the nav panel.

Thursday nights. If you or your Club/ Organization have material you would like aired via Spectrum, then please contact us by email to spectrum@spamex.com.

Northern Tasmanian Amateur Radio Club

A correction, the meeting referred to last month was the May 11 NTARC meeting not June 8! On June 8, Norm, VK7AC discussed his exploits on towers. Norm demonstrated several commercial connectors and cables and his video of the views of Sydney from atop the Channel 10 tower left most attendees suffering vertigo!

Radio and Electronics Association of Southern Tasmania Inc.

Over the weekend of 8-10 July a WICEN team of 32 operated to provide the communication infrastructure for the VK7 leg of the Subaru Safari. The team included 12 licensed amateurs plus 2 licensed juniors, 2 more juniors studying and other operators with marine, commercial or emergency services experience and 2 XYL's. WICEN also provided IT support for the Rally HQ in Geeveston.

Wednesday afternoons at the Domain clubrooms have seen about 10-20 regular attendees between 12:00 and 16:00 and activities include an active repeater group, trading, some WICEN radio re-programming, projects, homebrewing and even rag chewing and SSTV from the club station.

On 6 July REAST members and friends were treated to a tour of the Police Vessel Van Diemen. Our host was Skipper Leigh Stanley. This is a very impressive 23m vessel with full facilities for their crew of 5. A full range of communications modes is available including - Satphone, VMS, CDMA, VHF, VHF Marine, Fax, Email and internet. The Van Diemen will feature this month on the ABC in a series called Real Life Rescue. Many thanks to Leigh for showing us around.

VK4

Far North Queensland Horse Endurance Ride – Herberton

Radio Amateurs once again provided radio coverage for the above event from 21 – 25 June 2005, as they have done for the last few years.

The event covers about 80 km per day, two 40 km sections, and requires about three checkpoints during each section to ensure both horse and rider are on the correct track. These ensure they are fit and well, as well as giving the participants an indication of their speed.

Amateurs assisting were Dennis VK4JDJ, Stan VK4MFA, John VK4JON and Mike VK4MIK.

Communications were via 2 m FM, both simplex and duplex (VK4RTA), plus UHF CB which allows the base operator to direct aid to riders. There is a first aid person, as well as a vet and farrier at base during the ride.

The base antenna was a 5/8 whip with radials on sectionalised aluminium poles which are about 10 metres in height. Due to the hilly terrain, the use of 2 m and knife edge diffraction allows signals to propagate out of valleys, etc.

Once again the "Radio Men" received much praise for being a cheerful face, having a joke, giving water and just being there. As the ride progressed the appreciation increased due to the tiredness factor of horse and rider.

The days began before 5 am and concluded with a briefing on the next day's route and allocation of checkpoints about 4-5 pm.

Visitors to us were Dave VK4KIX and Bill VK4WL. Local hams also made contact over the period with Gary VK4ABW from Townsville, who made contact via VK4RTA – over 200 km!

Also, a long wire was trialled for our forthcoming event at Cooktown for the International Lighhouse Weekend, where we will be using the callsign VI4GHL. A couple of contacts into Japan were made with JN1VXT portable 6 and JA3KW portable 6 with our signal report of 5-9.

The "Radio Men" once again thoroughly enjoyed themselves whilst providing a public service.

Mike VK4MIK

VHF/UHF - an expanding world

David Smith VK3HZ - vk3hz@wia.org.au
Leigh Rainbird VK2KRR - vk2krr@wia.org.au

Weak signal

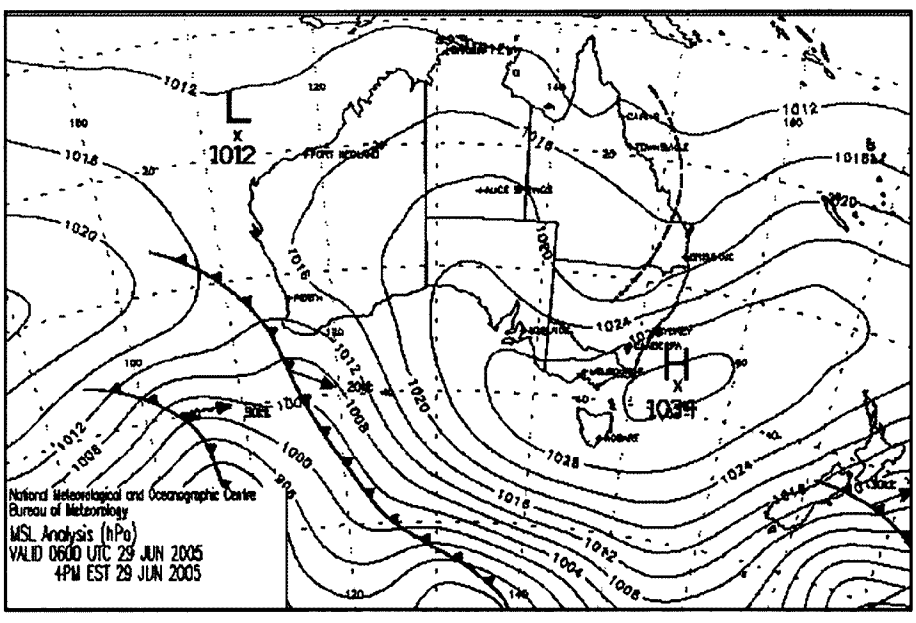
David Smith - VK3HZ

Not a great deal to report this month on the propagation side of things. However, even in winter, it is worth keeping an eye on the weather chart for the presence of a high-pressure cell in the right location. On the evening of 29 June, conditions picked up between Melbourne and Mt Gambier, with the VK5RSE 23 cm beacon reaching S9 in Melbourne. The weather chart for the time is shown below.

Of note is the presence of an intense high-pressure cell in a position where the isobars form a line of constant pressure between Melbourne and Mt Gambier. When you have this sort of alignment, it is definitely worth having a listen to the beacons as, more often than not, you will find tropo enhancement in the area. I scan the weather chart each night on the evening news, looking for such areas.

Doug VK3UM reports that, following his GippsTech presentation, he has released version 5.0 of his EMRCalc program. Several refinements have been added including ACMA Compliance Level 2 indication, E and H Plane requirement calculations, FCC levels in line with their current requirements as well as CEU (Council of European Union. ICNRP recommendations). On screen help/definitions have been extended. It may be downloaded from www.qsl.net/vk3bez/VK3BEZ.htm

GippsTech 2005 was another great success with nearly 100 amateurs and their partners attending. There was a full program of talks covering many areas of weak signal, EME, digital, microwave and even optical communications. During the coffee breaks, attendees had the opportunity to purchase specialty bits and pieces from several stalls, or browse the many technical displays. The lunches and evening dinners provided the opportunity to catch up with many of the like-minded enthusiasts in attendance. Thanks go to Peter VK3KAI and his cast of thousands who organised the weekend, which ran without a hitch (apart from Peter's car and house keys departing back north with one of the attendees). Also thanks to Alan VK3XPD who donated several prizes raffled off over the weekend. GippsTech 2006 is tentatively planned for 8 & 9 July, so mark that in your diary.



Weather chart June 29

EME

Doug VK3UM reports on his activity during the recent DUBUS EME contest over the weekend of 11-12 June.

"Conditions on 432 were poor to terrible at this location (worst for years). From my Moon rise at 01.20 Z 11 June 05 to about 02.30 Z fairly normal but significant defined (mostly aligned) Faraday. Suspect a disturbance at about 0230, as Libration became significant to extreme all through to my Moon set at 1033 Z. Deep short-term fading was also predominant making copy very difficult. Sun noise measured at 03.15 Z indicated very high activity and from my calculations relate to a SFU of about 140.

On Sunday 12 June 05 at my Moonrise 0140 Z Libration was still significant and again Faraday seemed still very narrow but nearly aligned. Fading was minimal but alignment was such as to make things difficult. I was transmitting and receiving vertical with one exception K0RZ. (normally I Tx V and Rx H into NA). Conditions had improved significantly at Moonrise into Eu at about 0830 Z. Libration had disappeared and signals were good. Unfortunately it did not last and from about 10.10 Z polarity again began to swing and Libration and deep short term fading returned with a vengeance. It was extremely hard going. Sun noise measured at 03.30 Z Sunday was back to normal at about a SFU of 80.

Participation was not great from NA but good from Eu. Plenty to keep me very busy though. The "gentlemen" operating times for us all were great for a change!

Here are some observations that may be of interest. Sun Noise on Saturday showed a 2.5 dB advantage in vertical polarization over horizontal as did ground noise in this polarity over what I measure as normal. Sundays' measurements returned normal figures. The apparent very narrow polarization

also provided some interesting and most detrimental effects. When Steve K1FO called me at 0159 Z Sunday I could not believe it was him at first and thought he was a little tardy in rotating the array. Not so, signals were "only" 55n so even the most experienced polarization alignment expert did not have it right. I also spent some time trying to decipher a very weak signal that turned out to be Trevor VK4AFL whose alignment at the time must have been close to a null for me. HB9Q was also "weak" at 55n and was only being received horizontal - were they Tx Linear? There were amongst all these degraded signals some outstanding and totally devoid of fading and Libration (at the time I was listening). These included from memory K5JL, DL9KR, D7APV, F2TU.

It was the hardest weekend I have participated in that I can recall. The Sun activity appeared to screw things up big time and for hours and hours on end. It must have tried everyone's patience to the extreme. It proved however to be most rewarding though, as one had to pull every trick in the book to decipher the extremely librated signals. I witnessed time and again the skill and patience from our fellow operators. I could not help thinking how much computer power (without any outside assistance) would be required to do what we humans were employing at the time. I felt I was using more ESP than DSP! It also appeared that the effect was not always reciprocal as I spent many Y's trying to decipher who was calling at times. One QSO took over half an hour! It was apparent that the other station was copying fine at the time when I was suffering from severe Libration. After it was all over I listened on 20 metres for a while to "detox" and assure myself what non-librated CW still sounded like! How easy is it there!

The following is an abbreviated list of stations worked:-

11 June 2005 - K5JL, VK4AFL, JA6AHB, KL6M, VE6TA, K0RZ, N9AB, OZ6OL, SM3BYA, SM3AKW, SP6JLW, SV1BTR, RW3RW, DR3RU, OZ4MM, HB9Q, DL9KR, OK1CA, DL0GER, F6KHM, G4YTL, G4RGK, DK3WG, JJ4NNJ

12 June 2005 - K1FO, JA6DZI, JA9BOH, KL7HFQ, DL7APV, SM2ILF, SM4IVE, RW3PX, F2TU, OK2BDQ, DL7UDA, EA3DXU, G3LQR, DJ6MB, I5CTE, S53RM, S53J, G3LTF, S54T, SM5IOT

for a claimed total of 44 stations and 23 multipliers 101200 points. (Total 6.5 hours operating time .. all totally random .. zilch assistance in any shape or form.. a ticket holding member of the elite Dinosaur Club and proud of it!..)"

Despite the poor conditions and the additional handicap of a far southern location, Doug's efforts seem to have paid off. According to the latest 432 and Above EME Newsletter, it looks like Doug has taken out second place in the contest against many much more favourably located stations. Congratulations to Doug.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital DX Modes

Rax Moncur VK7MO

Joe Taylor, K1JT, has released a "maintenance update of WJST" Version 4.9.8. It is useful in eliminating computer lock-ups with older versions and there are a few other minor bug fixes. Joe is now going back to the drawing board for a major re-write and has been seeking advice from users on their preferences for new features. His intention behind the re-write is to make WSJT independent of the Operating System, which would hopefully allow him to overcome some of the timing issues associated with Windows. This is turn may make it possible to achieve such things as averaging the input to the correlation (or deep search) decoder and make further sensitivity gains. From a VK point of view I have been encouraging Joe to add a more effective Meteor Zapper for JT65 and to allow longer message strings on FSK so one can send messages to more than two stations at a time, such as would be helpful on DXpeditions.

It is good to see John, VK5PO and Jeff, VK8GF trying out FSK441. John has also worked Wayne, VK4WS. Interest in VK4 is increasing with Phil, VK4CDI and Trevor, VK4AFL also now active.

The ZLs have established weekend activity sessions on 144.230 and have 4 or 5 stations participating each Saturday and Sunday. Bob, ZL3TY, reports that this is already leading to equipment improvements by a number of stations and hopefully it should result in some meteor scatter contacts from VK2 and VK4 to the North Island.

Ron VK6KDD reports that he and Don VK6HK have been testing with JT6M on 50.230 MHz between Port Hedland and Perth - a distance of approximately 1500 km. Contacts were made quite easily, completing in about 15 minutes. Long bursts and audio were clearly heard with many multiple decodes. Ron described it as an easy contact. Compared with 2 m, the bursts on 6 m are much longer - multiple seconds instead of fractions of a second. This allowed the noise blanker to be used. Ron's next sked on 6 m is with Otto YB0ASG in Jakarta – a distance of 2014 km. Ron managed to work him the Sunday prior on 50.110 in SSB.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

The magic band – 6 m DX

Brian Cleland VK5UBC

The month of June started with the very disappointing news that the Australian Broadcasting Authority had released a discussion paper which indicated that one of the candidate bands for the introduction of Digital Radio Services was VHF Band I (45-52 MHz and 56-70 MHz). This would obviously be very detrimental to 6 m operation in the 50-52 MHz area and could mean interference which would make weak signal overseas contacts impossible or even mean the loss of the first 2 MHz (50-52 MHz) of the 6m band for Australian Amateur operation. The paper sought submissions by the 27th June on the issues raised in the paper and several 6 m operators around the country submitted submissions.

The WIA also produced an excellent submission, which in summary opposed the introduction of DRS in the 45-52 MHz band and sought the allocation of the 50-54 MHZ band to the Amateur service on a primary service basis once the existing Channel 0 transmissions are discontinued. The 50-52 MHz portion of the 6 m band is presently secondary service. Check the WIA submission, which is available on the WIA WEB site and let the WIA Directors know how you feel about this important issue.

The month of June produced several winter E's openings. On the 13th June the band opened between Brisbane and far north Queensland. Scott VK4JSR in Brisbane reported working Gary VK4ABW Townsville and Paul VK4APN Cairns.

Then on the 15th June Rob VK1ZQR reported the band open from VK4 to VK7 and all points south of VK1. On the same day Dave, a SWL in Adelaide, reported hearing the Alice Springs VK8RAS/b and Richard VK5USB worked Ray VK4BLK Yeppoon. Steve VK3SIX also reported hearing some JA activity on that day.

The main winter openings then occurred on the 19th & 20th June. Brian VK5UBC reported the band opening to northern VK2, VK4 and VK6 on both days with several contacts completed. The opening to VK6 on the 19th was particularly good with both Peter VK6KXW and Steve VK6VZ being worked. Steve is new to 6 m and had good signal running 70 W and using a 5 el yagi. This was his best DX to date, welcome Steve. On these days the band was also open up and down the east coast with ZL contacts being reported from VK2, 3, 4 & 7.

On the 29th June Norm VK3DUT and SWL Dave from Adelaide reported ZL TV and the ZL3SIX/b but no stations heard. To round off the month on the 30th June Wayne VK4WS worked Brian VK5UBC.

The month of August is probably the best time to carry out any antenna work etc in preparation for the coming DX season.

Please remember to send any 6 m information to Brian VK5UBC at bcleland@picknowl.com.au . Thanks to those who are sending me information - I can only report what I know.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

Only very few openings in VK during June.

Some limited conditions appeared around north Queensland in the morning of the 13/06. Mike VK4MIK at Butchers Creek had good signals in from the Townsville repeater just after 0700. Mike spoke to Felix VK4FUQ from Ingham, with repeater signal up to S7, but slowly dropped out. Mike then had a listen to VK4RTA repeater on the Atherton Tablelands and could hear John VK4FNQ coming in from Charters Towers, Ross VK4AQ at Innisfail and also Dale 4DMC and Russell 4BEG from at Kurramine Beach. Mike had a listen on reverse and was able to copy all these stations also on the direct path.

An interesting report from Damien VK3HGY at Mirboo North in South Gippsland. On the evening of the 29/06 Damien got a taste of some real 2 m DX, working into VK5. Damien was able to make it into the Mt Gambier 146.900 repeater over a distance of 474 km. Welcoming Damien's signal to the repeater were Bill VK5WCC, Colin VK5DK and Michael VK3KVW (Ballarat). Damien reports the signal was up to S4 at times and he is running an Alinco dual-bander and a Diamond X50 vertical. This was Damien's furthest repeater contact to date.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au

ar

Corrections to article in July *Amateur Radio*, page 20:

VHF and microwave propagation characteristics of ducts (Part 2)

by Andrew Martin VK3KAQ

1) Figure 9 on page 20 should be:

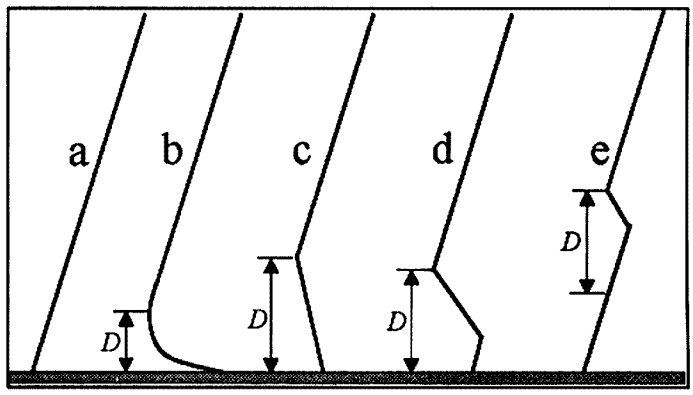


Figure 9. M profiles for various types of ducts. The depth of each D duct is shown for each type of duct. The M profile for a standard atmosphere (a), an evaporative duct has depths of up to 40 m (b), surface ducts have depths up to 300 m (c and d) and elevated ducts have depths up to 300 m at heights between 400 m and 1400 m(e). Elevated ducts also occur above 1400 m but are of limited interest to amateur operators.

The error was made during layout.

2) Correction to equation (3) on page 20. Should read:

$$\lambda_{max} = 0.6 \ * A * D * \sqrt{\Delta M} \qquad (3)$$

instead of

$$\lambda_{min} = 0.6 \ * A * D * \sqrt{\Delta M} \qquad (3)$$

We apologise for any inconvenience caused

Editor

Gridsquare standings at 20 July 2005

Guy VK2KU

144MHz Terrestrial

VK2FLR	Mike	113
VK3FMD	Charlie	103
VK2KU	Guy	102
VK2ZAB	Gordon	78 SSB
VK3KAI	Peter	78
VK2KU	Guy	69 SSB
VK3CY	Des	68
VK3PY	Chas	68 SSB
VK3HZ	David	64
VK2DVZ	Ross	62 SSB
VK2TK	John	62
VK3EK	Rob	62 SSB
VK3XLD	David	55 SSB
VK2EI	Neil	54
VK3TMP	Max	53
VK3BJM	Barry	51 SSB
VK3ZLS	Les	51 SSB
VK3BDL	Mike	50
VK7MO	Rex	48
VK2DXE	Alan	47
VK2KU	Guy	47 Digi
VK3KAI	Peter	47 SSB
VK3WRE	Ralph	46 SSB
VK2DXE	Alan	43 SSB
VK3CAT	Tony	40
VK3KEG	Trevor	39
VK4TZL	Glenn	38
VK2TK	John	35 SSB
VK3KAI	Peter	35 Digi
VK4KZR	Rod	35
VK3ZUX	Denis	33 SSB
VK6HK	Don	33
VK3ZYC	Jim	31
VK7MO	Rex	30 SSB
VK4CDI	Phil	29
VK2KRR	Leigh	28 FM
VK3KME	Chris	28 SSB
VK4CDI	Phil	28 SSB
VK2TK	John	27 Digi
VK4DFE	Chris	26 SSB
VK5ACY	Bill	26 SSB
VK2TG	Bob	25 SSB
VK3BBB	Brian	25
VK7MO	Rex	25 Digi
VK3YB	Phil	23
VK2EAH	Andy	22
VK3HV	George	21 SSB
VK3TLW	Mark	20 SSB
VK6KZ	Wally	20
VK3AL	Alan	18 SSB
VK3BG	Ed	17 SSB
VK6KZ/p	Wally	16
VK3ZYC	Jim	14 SSB
VK2EAH	Andy	13 SSB
VK3DMW	Ken	13
VK2CZ	David	12
VK7ZSJ	Steve	12
VK2EI	Neil	11 Digi
VK2DXE/p	Alan	10
VK3ANP	David	10
VK2EAH	Andy	9 Digi
VK3UDX	Geoff	6 SSB
VK6DXI	Mirek	6
VK6HK	Don	6 Digi
VK2TWO	Andrew	5
VK3ZDR	David	5 SSB
VK2AKR	Neil	3 Digi
VK2DXE	Alan	3 Digi
VK4TJ	John	3 SSB
VK2AKR	Neil	1 SSB
VK3XLD	David	1 Digi
VK4CDI	Phil	1 Digi

144MHz EME

VK7MO	Rex	137 Digi
VK2KU	Guy	125
VK2FLR	Mike	114
VK3CY	Des	70
VK2KRR	Leigh	30
VK4CDI	Phil	16
VK3HZ	David	12
VK3KEG	Trevor	4
VK3FMD	Charlie	3
VK2DVZ	Ross	2
VK2DXE	Alan	2

432MHz Terrestrial

VK2ZAB	Gordon	57 SSB
VK3PY	Chas	50 SSB
VK3FMD	Charlie	47
VK3XLD	David	47 SSB
VK3ZLS	Les	40 SSB
VK2KU	Guy	38
VK2KU	Guy	34 SSB
VK3EK	Rob	34 SSB
VK3HZ	David	34
VK3CY	Des	32
VK2DVZ	Ross	31 SSB
VK3BJM	Barry	31 SSB
VK3KAI	Peter	29
VK3KAI	Peter	28 SSB
VK3BDL	Mike	26
VK3WRE	Ralph	26 SSB
VK3TMP	Max	25
VK3KEG	Trevor	21
VK2TK	John	18
VK2TK	John	17 SSB
VK7MO	Rex	17
VK3ZUX	Denis	15 SSB
VK3BG	Ed	14 SSB
VK3CAT	Tony	14
VK4KZR	Rod	14
VK3TLW	Mark	13 SSB
VK6KZ	Wally	13
VK2KRR	Leigh	11 FM
VK4TZL	Glenn	11
VK3AL	Alan	10 SSB
VK3ANP	David	10
VK3YB	Phil	10
VK2TG	Bob	9 SSB
VK3BBB	Brian	9
VK4DFE	Chris	9 SSB
VK3KME	Chris	8 SSB
VK4CDI	Phil	8
VK6KZ/p	Wally	8
VK2FLR	Mike	6
VK6DXI	Mirek	6
VK7MO	Rex	6 Digi
VK2KU	Guy	5 Digi
VK3HV	George	5 SSB
VK3UDX	Geoff	5 SSB
VK3KAI	Peter	4 Digi
VK3PY	Chas	4 Digi
VK3XLD	David	4 Digi
VK3ZYC	Jim	4 SSB
VK2CZ	David	3
VK2TWO	Andrew	3
VK2DXE/p	Alan	2
VK4TJ	John	2 SSB
VK2AKR	Neil	1 SSB
VK2TK	John	1 Digi
VK3DMW	Ken	1

432MHz EME

VK4KAZ	Allan	14 CW
VK3FMD	Charlie	5
VK3HZ	David	3
VK7MO	Rex	3 Digi
VK2KRR	Leigh	1

1296MHz

VK3XLD	David	35 SSB
VK3PY	Chas	34 SSB
VK3FMD	Charlie	32
VK2ZAB	Gordon	29 SSB
VK3ZLS	Les	26 SSB
VK2KU	Guy	25
VK2KU	Guy	22 SSB
VK3EK	Rob	20 SSB
VK3KWA	John	19
VK3KAI	Peter	17
VK2DVZ	Ross	16 SSB
VK3KAI	Peter	16 SSB
VK3WRE	Ralph	16 SSB
VK3BDL	Mike	12
VK3BJM	Barry	12 SSB
VK3TMP	Max	11
VK2TK	John	10 SSB
VK3HZ	David	10
VK4KZR	Rod	10
VK7MO	Rex	10
VK3TLW	Mark	8 SSB
VK3AL	Alan	7 SSB
VK3BG	Ed	7 SSB
VK2CZ	David	5
VK3HV	George	5 SSB
VK3ZUX	Denis	5 SSB
VK3ZYC	Jim	5
VK6KZ/p	Wally	5
VK2KRR	Leigh	4
VK3BVP	Shane	4
VK3YB	Phil	4
VK3ZYC	Jim	4 SSB
VK6KZ	Wally	4
VK2KU	Guy	3 Digi
VK3BBB	Brian	3
VK3KEG	Trevor	3
VK6DXI	Mirek	3
VK2DXE/p	Alan	2
VK2FLR	Mike	2
VK3CY	Des	2
VK3KAI	Peter	2 Digi
VK3KME	Chris	2 SSB
VK3XLD	David	2 Digi
VK4TJ	John	2 SSB
VK3DMW	Ken	1
VK3UDX	Geoff	1 SSB
VK3ZYC	Jim	1 Digi
VK4TZL	Glenn	1
VK7MO	Rex	1 Digi

continued next page

Spotlight on SWLing

Robin Harwood VK7RH

Talking Broadband

In last month's column, I mentioned that I was considering going over to Broadband from the normal dialup process. The telco I previously was with does not have capabilities for ADSL and I switched over to the major network, which was able to provide it. I am satisfied that everything has performed very smoothly with a permanent reliable connection and faster downloads. Of course I have to disconnect the modem if I want to do some serious listening yet most of the present "birdies" seem to come from the computer thought not as many compared to the recently retired Pentium 75.

And while we are on Broadband, our electricity monopoly here in VK7, announced in the first week in July that they are going to trial BPL around the capital city of Hobart. Fortunately the newspaper article in the Launceston "Examiner" also mentioned that there were serious concerns about possible HF interference to amateur radio operators, aeronautical and marine services and the defence forces. It also stated that the ACA had issued guidelines and was closely monitoring developments. I know that hams down here are seriously worried about this BPL experiment, particularly in non-metropolitan areas away from telephone exchanges where ADSL is not available. It is also unclear whether BPL will be commercially viable as the same electricity monopoly unsuccessfully launched a rival telephone network in the 90s in competition to Optus and Telstra but it did not catch on. Will BPL go the same way? It is too early to say.

In late June, I was surprised to hear a station on a split channel, whilst tuning around for the BBC World Service on 9740. The propagation was not good on this morning and the Kranji relay was practically inaudible. There was a station on 9737 that I had not previously encountered. The program was in Spanish and seemed to be a sports program, probably a soccer match with a rapid-fire delivery. The announcer kept identifying as Radio National so naturally I checked the Passport to World Band Radio listings. The only station listed on the channel was Radio Nacional de Paraguay although listed as being inactive. However other monitors in the Americas were hearing the same station. Paraguay is a new country for me and the signal seems to be there daily particularly after the German station on 9735 signs off at 2100. It is best heard on LSB because of the BBC relay on 9740.

While I was compiling this month's column, my attention was distracted by images on the television of the London terror bombings. I was horrified to recognise the small private B&B in Russell Square that was only a few doors away from the Underground Station. In fact my first floor window overlooked the very street and where I dangled out some wire attached to my pocket transistor radio. Naturally only the strongest signals got through. I later discovered Bush House, the home of the BBC World Service was not far away. However it was impossible in those days to get in because of the threat of IRA attacks.

Well that is all for this month. My email address still remains vk7rh@wia.org.au. My snail mail is 20/177 Penquite Road, Norwood, Tas 7250.

ar

Gridsquare standings *continued*

2.4GHz

VK3PY	Chas	11 SSB
VK3XLD	David	11 SSB
VK3WRE	Ralph	9 SSB
VK3FMD	Charlie	8
VK3KAI	Peter	7 SSB
VK3EK	Rob	6 SSB
VK3HV	George	4 SSB
VK6KZ	Wally	4
VK3BJM	Barry	3 SSB
VK3HZ	David	2
VK3KAI	Peter	2 Digi
VK4KZR	Rod	2
VK3BG	Ed	1 SSB
VK3TLW	Mark	1 SSB
VK3ZUX	Denis	1 SSB
VK4TZL	Glenn	1

3.4GHz

VK3FMD	Charlie	8
VK3WRE	Ralph	6 SSB
VK3KAI	Peter	5 SSB
VK3HV	George	4 SSB
VK3XLD	David	4 SSB
VK6KZ	Wally	4
VK3EK	Rob	3 SSB

5.7GHz

VK3FMD	Charlie	10
VK3WRE	Ralph	9 SSB
VK3KAI	Peter	7 SSB
VK3XLD	David	5 SSB
VK6KZ	Wally	4
VK3BJM	Barry	2 SSB
VK3EK	Rob	2
VK3HV	George	2 SSB
VK6BHT	Neil	2 SSB
VK3KAI	Peter	1 Digi
VK3ZUX	Denis	1 SSB

10GHz

VK3FMD	Charlie	9
VK6BHT	Neil	9 SSB
VK3WRE	Ralph	8 SSB
VK3XLD	David	8 SSB
VK3KAI	Peter	7 SSB
VK3EK	Rob	5 SSB
VK6KZ	Wally	5
VK3HV	George	4 SSB
VK3PY	Chas	4 SSB
VK3TLW	Mark	3 SSB
VK3ZYC	Jim	3 SSB
VK5ACY	Bill	3 SSB
VK2EI	Neil	2 SSB
VK3BJM	Barry	2 SSB
VK3ZUX	Denis	2 SSB
VK7MO	Rex	2
VK3BG	Ed	1 SSB
VK3HZ	David	1
VK4KZR	Rod	1
VK4TZL	Glenn	1

24GHz

VK6BHT	Neil	3 SSB
VK2EI	Neil	2 SSB
VK3FMD	Charlie	2
VK6KZ	Wally	2

474THz

VK7MO	Rex	1

Additions, updates and requests for the guidelines to Guy VK2KU, vk2ku@tsn.cc, or by mail (QTHR 2005).

The guidelines (and the latest League Table) are also available on the website of the NSW VHF Dx Group at www.vhfdx.radiocorner.net - click on Gridsquares.

Next update of this table will be in early November 2005.

Stations who do not confirm their status for more than 12 months may be dropped from the table.

ar

Contests

Ian Godsil VK3JS,
Federal Contests Co-ordinator

Contest Calendar August – October 2005

Aug	**5**	**QRP Day Contest**	**(CW/SSB/FM/PSK31)**
	6	**TARA Grid Dip**	**(PSK/RTTY)**
	6/7	**10-10 Intl QSO Party**	**(SSB)**
	13/14	**Remembrance Day Contest**	**(CW/SSB/FM)**
	20/21	**Keymen's Club of Japan Contest**	**(CW)**
	20/21	**SEANET Contest**	**(CW/SSB)**
	27	**ALARA Contest**	**(CW/SSB)**
	27/28	**TOEC WW Grid Contest**	**(CW)**
	27/28	**YO DX HF Contest**	**(CW/SSB)**
Sep	**3**	**Russian Radio RTTY Contest**	**(RTTY)**
	3/4	**All Asian DX Contest**	**(SSB)**
	10/11	**Worked All Europe DX Contest**	**(SSB)**
	24/25	**CQ WW RTTY DX Contest**	**(RTTY)**
Oct	**1**	**PSK31 Rumble**	**(PSK)**
	1/2	**Oceania DX Contest**	**(SSB)**
	8/9	**Oceania DX Contest**	**(CW)**
	10	**10-10 International Day Sprint**	**(All Modes)**
	15/16	**JARTS WW RTTY Contest**	**(RTTY)**
	16	**Asia-Pacific Sprint Contest**	**(CW)**
	16	**RSGB 21/28 MHz Contest**	**(CW)**
	29/30	**CQ WW DX Contest**	**(SSB)**

Greetings to all Readers.

Last month my wife and I left Melbourne for VK4, as do many southerners, so that the Queenslanders call us the "Southern Invasion" or the "Grey Nomads". Apart from wanting to see any changes around Charters Towers/Townsville since I worked there in the 1980s, we also wanted to see towns that we missed 20 years ago and be warm!

I have heard operators talking as they roamed around Australia, but I have never given serious thought to how to equip with HF. Just getting 2 metres, UHF CB and a mobile phone into the modern car was bad enough, but HF?? – especially with my requirements of CW and contest logging..

It has been quite an operation, with somewhat limited success. The real challenge will be how to take a meaningful part in the RD Contest in the light of non-AC power supplies.

This reflects Life when you think about it – we take for granted our mod. cons, but do we really need them? No!

I hope you have risen to the challenge of having your station in tip-top condition for the RD Contest and that you will do well. Please remember that every entry helps your State in its total score.

RD Contest

I hope by now you will all have seen the changed rules for this year's event. Our new Contest Manager, Chris VK4AA, felt that some new life could be injected into the competition. I believe that with YOUR co-operation this can be achieved. One single revision may not be enough – there may be some anomalies which only operating will bring to light.

Again I stress that only by everyone's participation can we arrive at a satisfactory consensus on a new direction for this contest. As I said, I hope your station will be in tip-top condition and that you will make every effort to take part; however, do be careful of the various bonus points to be allocated. Certainly this will make for some extra effort in setting out your Log, but it should not be too difficult, and you will be helping to change the face of the RD Contest for future years. Good luck!

QRP Day

A contest with a difference is the annual QRP Day Contest, sponsored by the CW Operators' QRP Club of Australia.

The challenge is to operate at QRP levels, but it is not a requirement. Neither is the contest confined to the CW mode – please read the rules below, on the WIA web site http://www.wia.org.au, or on the Club web site http://www.users.on.net/zietz/qrp/club.htm

Give this one a go for an hour or so, and it's good practice for the RD the following weekend.

ALARA

The other notable VK event this month is the ALARA Contest. Although organized by the ladies of our AR community, it is NOT a girls-only event. They are waiting for calls from OMs anywhere in Australia. Please make this a good year for them, too.

73 and good contesting,

COQC QRP Day Contest 2005

0800z - 1200 UTC

Friday, 5 August

Sponsored by the CW Operators' QRP Club in Australia and open to all AR operators, the objects are --

1. to work as many stations as possible in each hour,
2. to encourage contacts between VK, ZL and P29 stations,
3. to encourage the use and enjoyment of low power equipment, whether commercial or home-brewed,
4. to test the efficiency of your station under QRP conditions,
5. to compete for a certificate for best hour and/or best three hours,
6. (in VK) to prepare for the Remembrance Day Contest.

Entrants are encouraged to compete for all four hours, but to submit their logs on the basis of "best three hours". Logs will also be considered for highest score in any individual hour.

SECTIONS: HF and VHF

CATEGORY: Single Operator only.

HF

MODES: CW, SSB, PSK31, Mixed.

BANDS: All HF bands (no WARC) may be used, although it is envisaged that the bulk of operations will be on 80 and 40 metres.

EXCHANGE: RS(T) plus serial number beginning at 001 and incrementing by one for each contact.

REPEAT CONTACTS: In order to make greater use of available band space and time, repeat contacts with the same station will be allowed once each hour of the contest.

Scoring:

Stations within VK/ZL/P29 score as follows --

VK-VK 1 pt ZL-ZL 1 pt P29-P29 1 pt
VK-ZL 3 pts ZL-VK 3 pts P29-ZL 3 pts
VK-P29 3 pts ZL-P29 3 pts P29-VK 3 pts

Any DX stations (outside VK/ZL/P29) score 5 points.

A BONUS of 20 POINTS may be claimed if the QRP station operated with an homebrew transmitter or transceiver.

FINAL SCORE is the sum of the total QSO points, plus any bonus points. Except for the use of homebrew equipment (see above), no multipliers apply.

LOGS: PLEASE USE SEPARATE LOGS FOR CW, SSB, PSK31 or MIXED MODES. Logs must show full details of time UTC, station worked, band, mode, exchange and points claimed. Arrange logs so that each hour is clearly distinguishable. Logs should be submitted for "best three hours" and scores will be considered for highest score for each separate hour. Please indicate clearly if you claim the 20 points bonus for homebrew equipment (once only for the Contest).

CERTIFICATES: Certificates will be awarded to the following -

(i) first three placegetters in each mode who submit "best three hours" entries,

(ii) the highest scorer in each hour in each mode in each call area.

GENERAL:

(i) A SUMMARY SHEET, showing operator's callsign, name, address and points claimed should accompany the Log.

(ii) Any station claiming to operate QRP MUST NOT exceed a maximum of five watts carrier to the antenna and should add /QRP after its callsign.

SEND logs as below.

VHF

BANDS: 6 metres, 2 metres and 70 cms.

MODE: FM only.

EXCHANGE: RS plus serial number beginning at 001 and incrementing by one for each contact.

REPEAT CONTACTS: In order to make greater use of available band space and time, repeat contacts with the same station will be allowed once each hour of the Contest.

SCORE: One point per contact.

LOGS: Entrants may use separate logs for each band if they wish, but this is not a requirement. However, please arrange logs so that each hour is clearly distinguishable. Logs must show full details of time UTC, station worked, band, mode, exchange and points claimed. Logs should be submitted for "best three hours" and logs will be considered for highest score for each separate hour.

CERTIFICATES: Certificates will be awarded to the following -

(i) first three placegetters in each call area who submit "best three hours" entries,

(ii) the highest scorer in each hour in each call area.

GENERAL:

(i) A SUMMARY SHEET, showing operator's callsign, name, address and points claimed should accompany the Log.

(ii) Any station claiming to operate QRP MUST NOT exceed a maximum of five watts carrier to the antenna and should add /QRP after its callsign.

SEND Logs and Summary Sheet by mail to --

Ron Everingham VK4EV,

30 Hunter Street, Everton Park, Queensland, 4053, Australia.

Logs may also be sent via email to vk4ev@bigpond.com

All entries to be received no later than Friday, 19 August, 2005.

Clarification to RD 2005 Rules

12c to read:

12c. Contacts with any station within VK8, VK9 and VK0 (zero) P2 and ZL will also earn double points for both sides of each contact outside of their own area

John Moyle Field Day Results

Six Hour Portable Operation – Multiple Operator

Call Sign	Operators	Mode	Band	Score	Contacts	Award
VK5SR	Multi	Phone	All	2188	268	*
VK3AWS	Multi	Phone	All	1794	225	*
VK1YBQ	Multi	Phone	HF	340	170	*
VK3FRC	Multi	Phone	VHF	266	62	*
VK3APC	Multi	Phone	All	74	37	*
VK8DA	Multi	Phone	HF	25	18	*

Six Hour Portable Operation – Single Operator

Call Sign	Operators	Mode	Band	Score	Contacts	Award
VK3ZPF	Single	Phone	VHF	1260	109	*
VK5OM	Single	Phone	VHF	1030	40	*
VK3JIY	Single	Phone	All	588	88	*
VK5AVQ	Single	Phone	VHF	302	17	*
VK6ZN	Single	Phone	HF	272	136	*
VK7TRF	Single	Phone	HF	96	48	*
VK4TGL	Single	Phone	All	84	20	*
VK1AI	Single	All	HF	70	35	*
VK2IRP	Single	Phone	HF	64	32	*
VK5VH	Single	Phone	HF	38	19	*
VK3HV	Single	Phone	VHF	2	1	*

* Certificate Awarded

** President's Cup

24 Hour Portable Operation – Multiple Operator

Call Sign	Operators	Mode	Band	Score	Contacts	Award
VK3CNE	Multi	Phone	All	5440	618	*
VK3ER	Multi	All	All	4966	272	*
VK2SRC	Multi	Phone	All	4548	488	*
VK3BML	Multi	Phone	All	2904	331	*
VK3QM	Multi	Phone	VHF	2473	197	*
VK5AR	Multi	Phone	All	2032	196	*
VK5BP	Multi	Phone	All	1934	387	*
VK4IZ	Multi	Phone	HF	1750	875	*
VK3GH	Multi	Phone	All	1720	307	*
VK4BAR	Multi	Phone	All	1444	252	*
VK5BAR	Multi	Phone	HF	652	326	*
VK4CHB	Multi	Phone	All	556	100	*
VK6XAA	Multi	Phone	HF	508	258	*
VK4WAT	Multi	All	All	484	235	*
VK4WIT	Multi	Phone	HF	180	90	*
ZL4AL	Multi	Phone	HF	134	67	*
VK4TWR	Multi	Phone	HF	112	56	*

24 Hour Portable Operation – Single Operator

Call Sign	Operators	Mode	Band	Score	Contacts	Award
VK3KYF	Single	Phone	HF	534	267	*
VK5OQ	Single	Phone	All	248	90	*
VK3UBM	Single	Phone	HF	232	116	*
VK3FPJ	Single	Phone	HF	200	100	*
VK7JGD	Single	Phone	HF	182	81	*
VK4EV	Single	All	HF	128	64	*
VK5MX	Single	Phone	All	112	52	*
VK3XBA	Single	Phone	VHF	51	36	*
VK3JS	Single	CW	All	76	40	**
VK2JHN	Single	Phone	VHF	44	4	*
VK5UE	Single	Phone	VHF	40	20	*

* Certificate Awarded

** President's Cup

Home Station – 24 Hour

Call Sign	Operators	Mode	Band	Score	Contacts	Award
VK2KRR	Home			395	256	*
VK2ZQX	Home			144	86	*
VK2ZZF	Home			104	59	*
VK2CZ	Home			100	50	
VK4HTM	Home			83	51	
VK3KQB	Home			64	36	
VK2AKB	Home			44	26	
VK2DF	Home			37	23	
VK6NU	Home			34	20	
VK7HAY	Home			30	22	

Home Station – 6 Hour

Call Sign	Operators	Mode	Band	Score	Contacts	Award
VK2FFG	Home			214	143	*
VK3XKS	Home			139	87	*
VK3JPP	Home			101	73	*
VK7VH	Home			80	57	
VK3BJM	Home			66	37	
VK4GZ	Home			65	42	
VK3UDX	Home			44	22	
VK2GR	Home			38	22	
VK8AV	Home			17	9	

Check Logs

Call Sign	Operators	Mode	Band	Score	Contacts
VK5JGM	Home				28
VK3CIS	Home				3

* Certificate Awarded

Comments on John Moyle Memorial National Field Day 2005

This year's entries came from every Australian mainland call areas and Tasmania. We also had two entries from across the Tasman from ZL. This was a change from last year's results.

There was a major mix up when some 15 logs were 'lost' when the IT staff decided that some e-mail IN Boxes were too large and when the results were initially announced a number of Hams – quite correctly – complained. I had not noticed that a complete directory had been deleted and so when the complaints were sent I investigated found a back up copy of the files – luckily. I have included all of the results that I received in total and if any are missing they are completely lost and I can only offer my apologies to anyone affected. This will not happen again as I have already put in place an alternative system. Again sorry if your log is missing.

Based upon submitted logs there were some 6841 contacts amounting to some 36279 points claimed. This was pretty heavy contesting but it resulted in only some 65 logs being submitted. Unfortunately the number of stations who went to the bother of going out and setting up as a portable station and then not bothering to submit a log as an entry was a disappointment. Perhaps we can put in a little bit more effort next year? Plenty of multiple operators got very big scores and perhaps a revision of the rules for large club stations is worth considering.

All portable stations that went to the effort to send in a log got a certificate. Largely due to the 'missing' logs, but once the decision was taken it is hard to reverse and I believe that people who made the effort to set up a portable station and operate should be acknowledged.

Activity was carried out on all bands permitted under the rules. (It is wondered if the additional WARC bands of 10, 18, and 24 MHz would make much of a difference? Perhaps a rule change might be in order here as the rules were initially drafted before these bands became available?)

Over to you

Pipes – more on dimensions

In trying to explain pipe sizes, Barry VK3BJM (OTU AR June 05), makes a fundamental error about pipe diameters.

Pipe sizes are designated by "nominal bore" (NB) sizes, but it is the outside diameter (OD) of a particular pipe size which is fixed, regardless of the wall thickness. This came about because in the days when steel was the only material available, pipes were joined to threaded fittings by threads cut on the outside of the pipes - the so-called "British Standard Pipe" thread (known as BSP). The OD of the pipe had to be constant so that threads cut on the outside of pipes of different wall thicknesses would always be the same. The dimension which does change with wall thickness is the bore diameter, and this is the reason the designation is given as "nominal bore"; ie, it is not a fixed dimension.

When plastic pipes came along, a socket glue-on fitting system was developed for end connections. Once again the OD had to be fixed for a particular nominal bore pipe, so that the same glue-on fittings could be used regardless of the pipe's wall thickness. The outside dimensions of steel pipe were adopted for the new plastic pipe. When PVC pipe is used in pressure applications, thicker wall dimensions are required, resulting in smaller inside diameters. The system is designated GWS and the pipe is coloured white.

Typical sizes of GWS pipes and their ODs are:

3/4" (20mm) NB pipe is 27mm OD
1" (25mm) NB pipe is 33mm OD
1-1/4" (32mm) NB pipe is 42mm OD
1-1/2" (40mm) NB pipe is 48mm OD
2" (50mm) NB pipe is 60mm OD
2-1/2" (65mm) NB pipe is 75mm OD
3" (80mm) NB pipe is 89mm OD
4" (100mm) NB pipe is 114mm OD
6" (150mm) NB pipe is 160mm OD

Different OD dimensions were adopted for low pressure PVC sewer and vent pipes. Sewer pipe is designated DWV (drain, waste & vent) and the colour of the pipes and fittings is grey, though not always.

Typical sizes of DWV pipes and their ODs are:

1-1/4" (32mm) NB pipe is 36mm OD
1-1/2" (40mm) NB pipe is 43mm OD
2" (50mm) NB pipe is 56mm OD
2-1/2" (65mm) NB pipe is 69mm OD
3" (80mm) NB pipe is 82mm OD
4" (100mm) NB pipe is 110mm OD
6" (150mm) NB pipe is 160mm OD

Stormwater pipe follows an OD size designation for the smaller sizes but not for larger sizes; eg,

75mm pipe is 75mm OD
90mm pipe is 90mm OD
100mm pipe is 110mm OD
150mm pipe is 160mm OD

PVC conduit follows a metric system where the size is equal to the OD. So "25mm conduit" is 25mm OD exactly.

Confused? Well, VK3BJM suggested taking a micrometer (or vernier callipers) with you when buying PVC pipe and this is probably a good idea to ensure you get the pipe system and diameter you are seeking.

Peter Stuart, VK2BEU

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

Contests *continued*

Band	UHF		VHF		HF	
	Contacts	Points	Contacts	Points	Contacts	Points
10 GHz	4	120				
5.7 GHz	1	30				
2.4 GHz	8	104				
23cm	132	1536				
70 cm	735	7957				
2m			1229	16356		
6m			473	6687		
10m					316	628
15m					178	344
20m					1136	2231
40m					2916	5609
80m					1291	2470
160m					4	8
Total	880	9747	1702	23043	5841	11290

The participation across the Call Areas was patchy.

Call Area	Portable	Home	Total
VK1	2	0	2
VK2	3	8	11
VK3	16	6	22
VK4	8	2	10
VK5	10	1	11
VK6	2	1	3
VK7	2	2	4
VK8	1	1	2
ZL	1	1	2

One interesting observation from these results is that the weather was a possible explanation of the very poor turn out of portable stations in VK2.

It is certainly interesting when one considers the weather in a given call area.

Very few stations from VK2 ventured out to operate a portable station, with most (70%) deciding to operate from home. Maybe next year we can get a few more portable stations in VK2?

Comments were sent in by an equal number of contributors for and against the 3 hour block timing process. The likelihood is that the rule might well stay unless sufficient feedback can be collected either way.

The scoring on VHF may need a revision as the scores produced on VHF far exceed the scores on HF where the effort required to get a high score far out weighs the comparative effort on VHF.

Well done to all of those that participated in the contest and well done those who bothered to submit a log. It is hoped that the number of logs to be submitted next year might reverse the past trend?

Denis Johnstone (VK3ZUX)

ar

Beyond our shores

David A. Pilley VK2AYD
davpil@midcoast.com.au

Finland

Guinness World Record

Guinness World Records Ltd., has awarded a certificate to Jukka Heikinheimo, OH2BR, for a record number of contacts made by an individual from one location in one year. Operating as VP6BR from Pitcairn Island, Jukka made 56,239 contacts between 25 January and 21 April 2000. Jakka's achievement was noted in the Finnish national newspaper "Helsingin Sanomat"

(June RadCom)

U.S.A.

Ten-tec co-founder Al Kahn, K4FW, SK

Albert R. "Al" Kahn, K4FW, of Cassopolis, Michigan, died June 15. He was 98. An ARRL member, Kahn, with Jack Burchfield, K4JU, co-founded Ten-Tec following his retirement from Electro-Voice (E-V), which he'd also founded and served as president. Kahn continued his regular CW schedules until just a few days before he died.For those of you that have used an Electro-Voice microphone, or a Ten-Tec transceiver, you would be aware of Al's contribution to amateur radio. David Sumner, K1ZZ, CEO of the ARRL summed it in one sentence. "It's a sad day, but few of us will leave the sort of footprint that Al did during his long and productive life".

(ARRL)

U.K.

Pubs On The Air

Couldn't resist adding this into the column!

First there was IOTA, then SOTA. Now a couple of UK Amateurs have come up with the idea of a new interest group: PHOTA – "Public Houses On The Air." The mind boggles at the sort of reports that could be handed out. Imagine what the customers would be saying with someone calling "CQ PHOTA" with a pint in his hand!

(RSGB)

Japan

Restructuring: Japan goes Slow-code

Japan is going "slow code" rather than "no-code." for access by its radio amateurs to the High Frequency bands.

Japan's Ministry of Post and Telecommunications made the announcement of the changes on May 24th. The agency said that as of October 1st of this year, applicants for Japan's 1st and 2nd class licences need only pass a 5 wpm Morse test with two minutes of solid copy to attain full access to the H-F bands. Previously these two license classes required 12 and 9 word per minute Morse speeds respectively.

Also announced was that the code test requirement for a third class licence will be eliminated. It has required that an applicant pass a 5 word per minute Morse test. The very popular code free fourth class licence requirements remain unchanged.

New Zealand

Visiting?

Prospective visitors to NZ will be interested in a report by the NZART Administration Liaison Officer Fred Johnson ZL2AMJ that appeared in the March/April issue of "Break In". It says: "Visitors to New Zealand from any country who hold a current amateur licence in their home country may operate in New Zealand under conditions shown in a 'General User Radio Licence'. This licence and conditions are on the MED RSM web page for all to see. Again the maximum possible facility has been adopted by New Zealand. New arrivals becoming permanent residents and having overseas qualifications are treated on a case-by-case basis". See www.med.govt.nz

New Zealand

New President

Congratulations to Bruce Douglas, ZL2WP who was appointed President of NZART at their AGM held in New Plymouth in June. The appointment is normally for two years which will give Bruce an opportunity to carry out his duties more fully. Also our congratulations go to John Lockead ZL4QS who was appointed Vice President.

U.K.

Falling in with CEPT

Technically qualified United Kingdom radio amateurs who hold that nation's Foundation or Intermediate licences cannot currently operate in other countries who are CEPT signatories. At this time only U-K Advanced holders are allowed to do that. But it looks as if this may be about to change. Work is currently underway to produce a CEPT Novice Radio Amateur Licence. When adopted this will allow operation in all the nations that are signed up to the pan-European CEPT licensing agreement. Let's hope our new proposed licences conform.

(ARNewsline)

ar

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

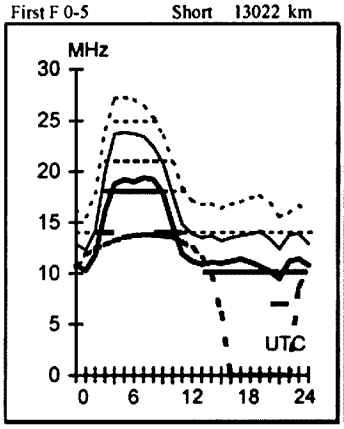
August 2005
T index: 22

Legend

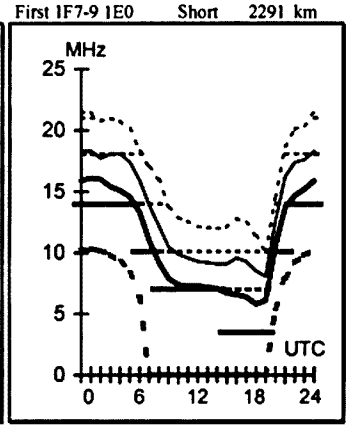
Frequency scale: UD, E-MUF, OWF, F-MUF, ALF, >10%, >50%, >90%

Time Scale

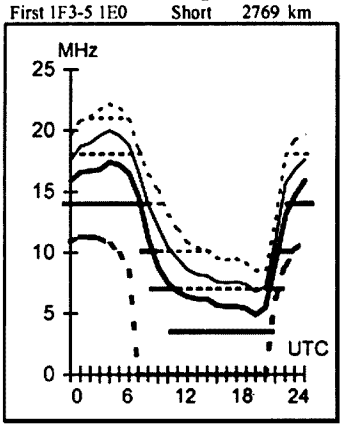
Adelaide-Amman 292
First F 0-5 Short 13022 km



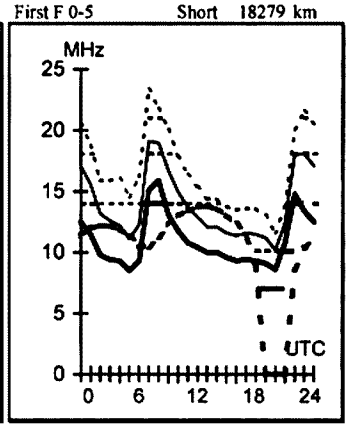
Brisbane-Auckland 123
First 1F7-9 1E0 Short 2291 km



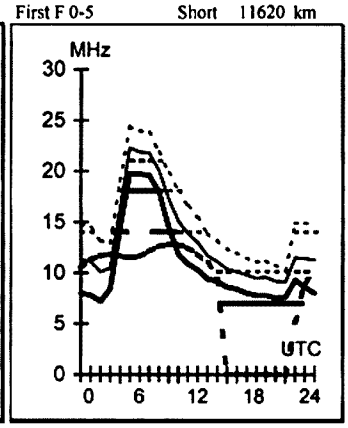
Adelaide-Invercargill 126
First 1F3-5 1E0 Short 2769 km



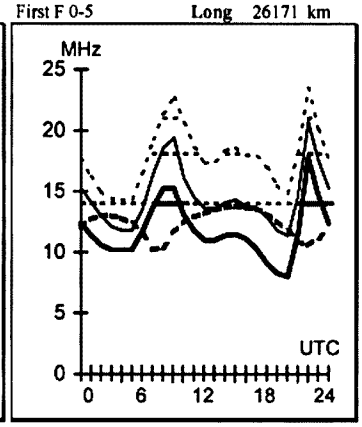
Brisbane-Dakar 217
First F 0-5 Short 18279 km



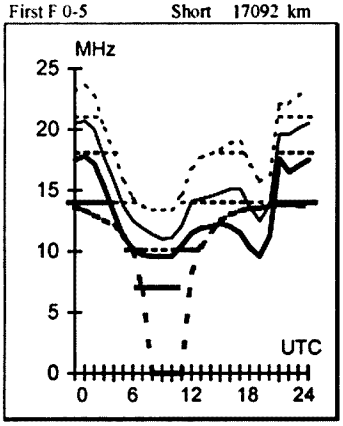
Canberra-Lusaka 239
First F 0-5 Short 11620 km



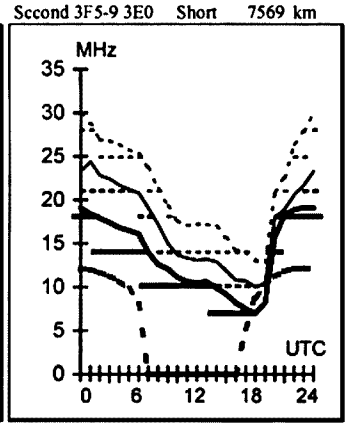
Darwin-London 145
First F 0-5 Long 26171 km



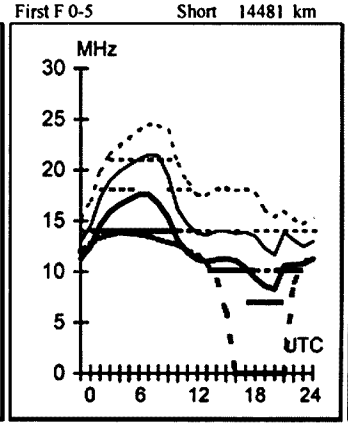
Adelaide-New York 67
First F 0-5 Short 17092 km



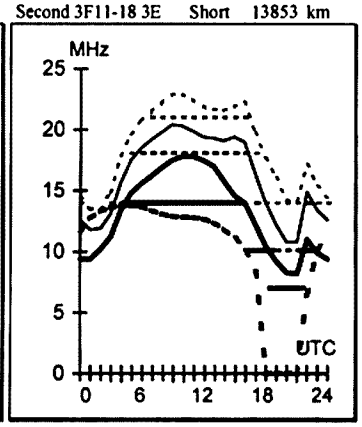
Brisbane-Honolulu 49
Second 3F5-9 3E0 Short 7569 km



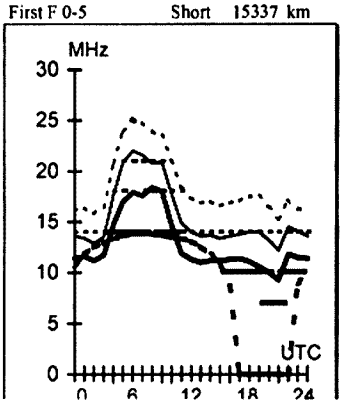
Canberra-Moscow 317
First F 0-5 Short 14481 km



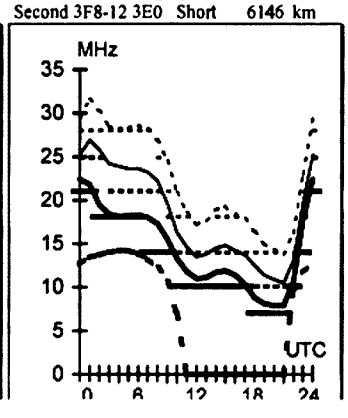
Darwin-London 325
Second 3F11-18 3E Short 13853 km



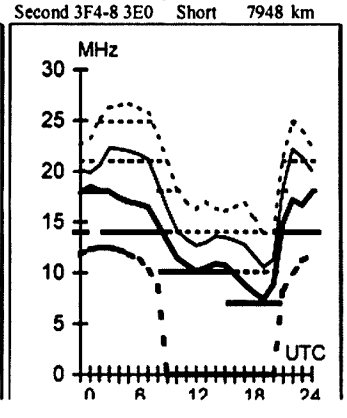
Adelaide-Rome 296
First F 0-5 Short 15337 km



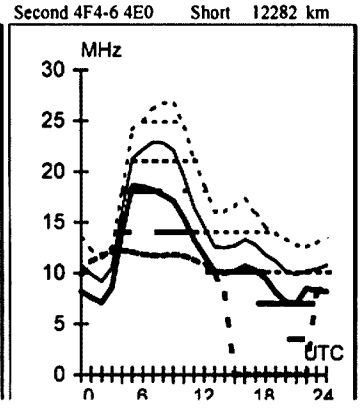
Brisbane-Singapore 293
Second 3F8-12 3E0 Short 6146 km



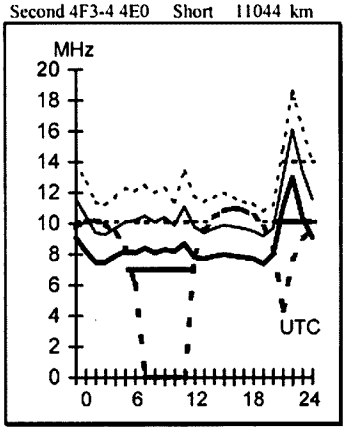
Canberra-Tokyo 362
Second 3F4-8 3E0 Short 7948 km



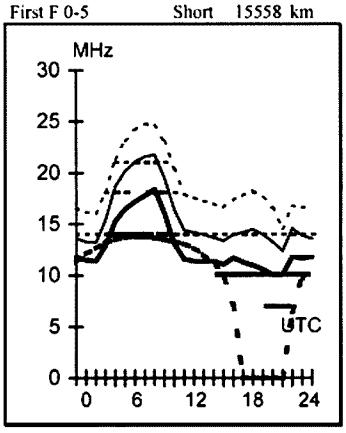
Darwin-Pretoria 242
Second 4F4-6 4E0 Short 12282 km



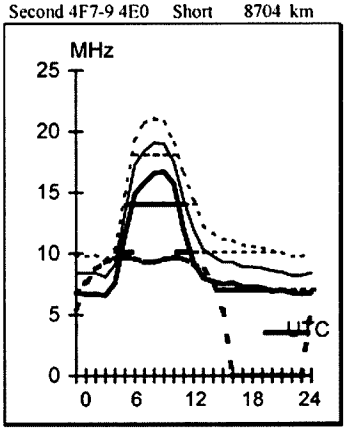
Hobart-Montevideo 161
Second 4F3-4 4E0 Short 11044 km



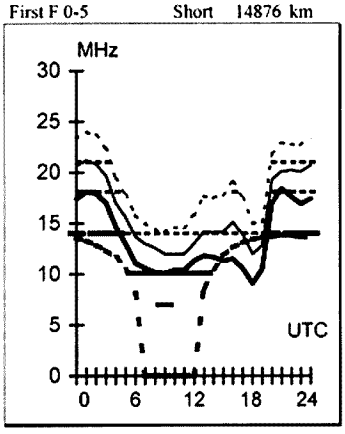
Melbourne-Budapest 302
First F 0-5 Short 15558 km



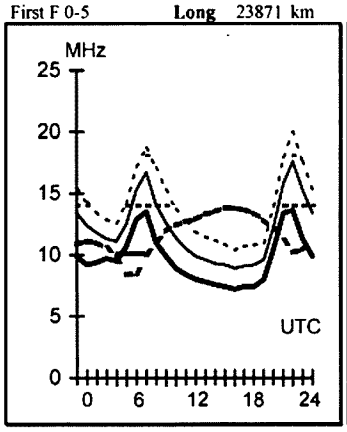
Perth-Capetown 237
Second 4F7-9 4E0 Short 8704 km



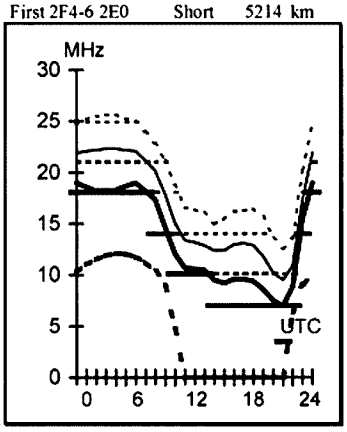
Sydney-Chicago 62
First F 0-5 Short 14876 km



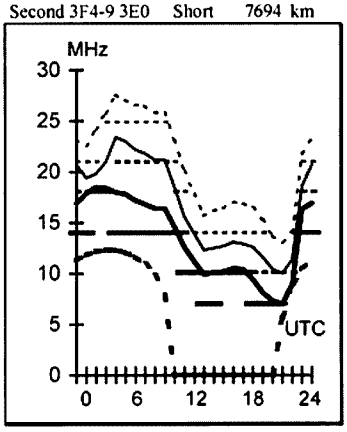
Hobart-Stockholm 136
First F 0-5 Long 23871 km



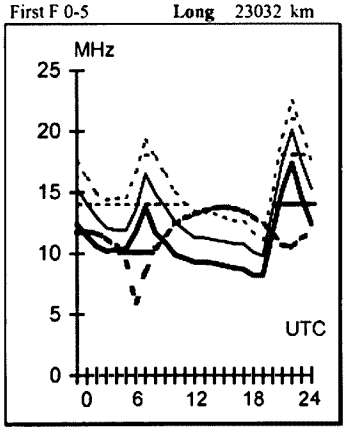
Melbourne-Jakarta 303
First 2F4-6 2E0 Short 5214 km



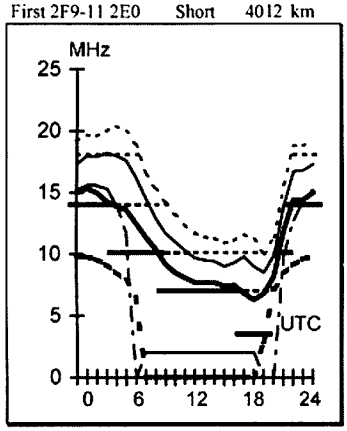
Perth-Osaka 17
Second 3F4-9 3E0 Short 7694 km



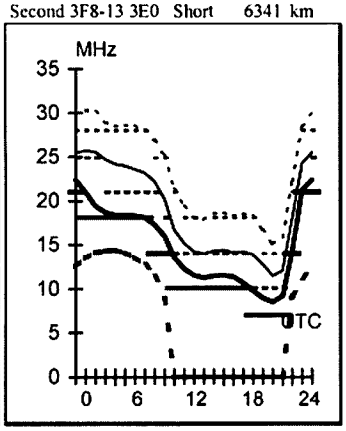
Sydney-London 139
First F 0-5 Long 23032 km



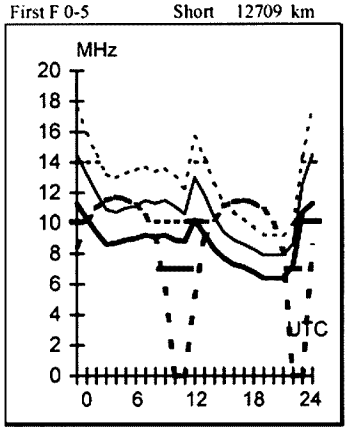
Hobart-Suva 56
First 2F9-11 2E0 Short 4012 km



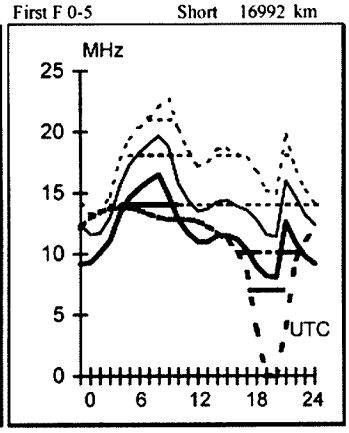
Melbourne-Manila 332
Second 3F8-13 3E0 Short 6341 km



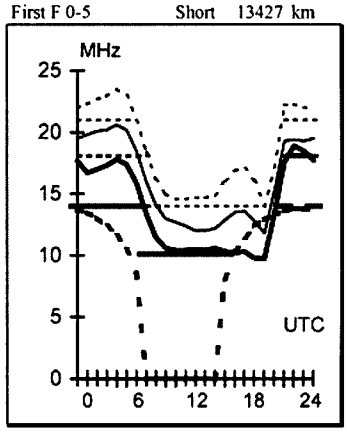
Perth-Santiago 174
First F 0-5 Short 12709 km



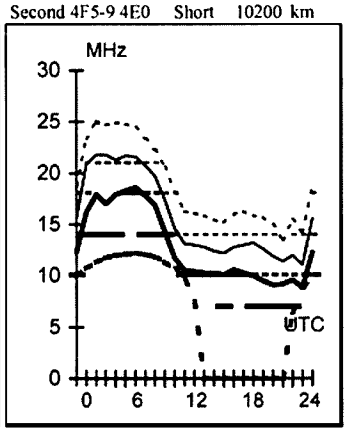
Sydney-London 319
First F 0-5 Short 16992 km



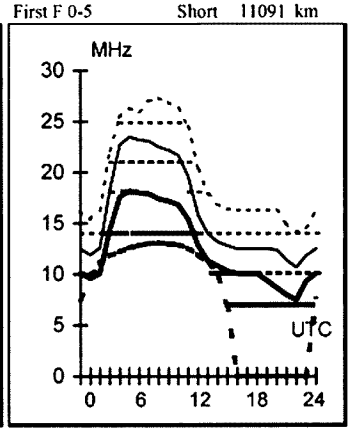
Hobart-Vancouver 239
First F 0-5 Short 13427 km



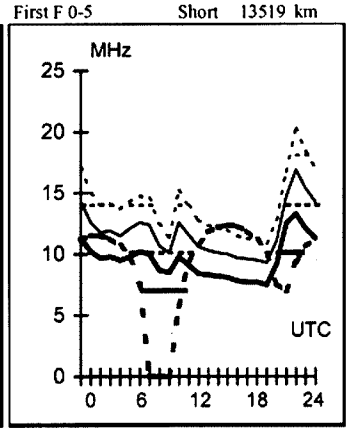
Melbourne-New Delhi 306
Second 4F5-9 4E0 Short 10200 km



Perth-Tel Aviv 302
First F 0-5 Short 11091 km



Sydney-Rio de Janeiro 164
First F 0-5 Short 13519 km



AMSAT

Bill Magnusson VK3JT

New satellite from the Netherlands

At the time of writing a presentation on a new Dutch Amateur Satellite is planned for the AMSAT-UK International Space Colloquium, at the University of Surrey.

The July event will be over by the time you read this and hopefully more details of the Dutch presentation will be available next month.

Students from the Delft University of Technology in the Netherlands were to attend the event. They are currently building an amateur satellite called Delfi-3C which will carry a 70cm to 2 metre linear transponder and is scheduled for launch at the end of 2006.

Further information on Delfi-3C can be found at: http://www.delfic3.tudelft.nl/ More news as the project matures.

The long-awaited solar sail experiment

Long-awaited, yes, and unfortunately we'll have to wait a while longer. The spacecraft failed to go into orbit due to a malfunction of the second stage of the rocket. Faint signals were reported early on but they proved to be from other sources.

The solar sail was a project of the "Planetary Society" and details are available on their web site. www.planetary.com. Maybe next time.

Auto-doppler and LEOs.

As frequencies go higher and higher, users of linear SSB transponders on low-earth-orbiting satellites have to cope more and more with the difficulties of keeping their QSOs on frequency as the satellites travel first closer to and then away from their locations.

To make matters worse the station a particular operator is in contact with will be experiencing a different set of distances and rates of approach and recession.

In the past 'protocols' have been developed to cope with this situation. The most common protocol has been for stations in contact to agree to leave the receiver dial alone and keep themselves on frequency by tuning the transmitter dial as they are talking.

Another, possibly more effective way is to leave the dial alone on which ever of the two frequencies is lower and tune the higher one.

Of course these two methods are the same if the transmit frequency is the higher of the two. Lately some computer tracking programs have been written to partially or fully implement this or some other similar form of automatic Doppler tuning.

I've commented before in this column as to their effectiveness. On last month's AMSAT-VK net Roy VK4ZQ reported that he and several others had recently been trying out the automatic Doppler compensation capabilities of the tracking program SatPC32 on AO-51 and VO-52 and had found that it was possible to conduct an effective QSO without the hassle of continually fiddling with dials. This is good news and I'd urge you to download the program and have a go. The more operators trying this method the better as it will help everyone to "iron-out" any problems and could make operating these satellites even more of a pleasure.

"S" mode down-converter

Every now and then a supply of ex-MDS or "wireless" type 2.4 GHz down converters becomes available and this affords the opportunity to get into mode-S relatively cheaply.

Tim VK2XTT recently posted a message on the AMSAT-BB to the effect that he had found a supply of such devices. If you've been contemplating a move to mode-S, have a look at Tim's web site at http://vk2xtt.penrith.net/ The unit described is completely waterproof and includes a high gain patch/disc yagi as part of the package. Tim is investigating some slight mods to move the IF frequency a little closer to the normal coverage of current 70cm amateur transceivers. Updates will be posted on the site as they happen. I'll also try to keep you posted here as well.

My advice is to make up your mind quickly about one of these units if it takes your fancy as several times in the past when similar devices have been available, the source dries up fairly quickly and a number of people miss out.

Commercially available down converters and mast head amplifiers tailored specifically for the amateur radio satellite band and for use with commercial ham transceivers are available but can cost many hundreds of dollars.

SSETI Express on track for a launch this month.

Work on SSETI Express has now been completed and it has left the cleanroom at the ESA facility in the Netherlands.

At the time of writing the spacecraft is en-route to the launch site at Plesetsk in Northern Russia. The launch date is still listed as 25th August. Full details of the telemetry downloading and decoding software will be forthcoming soon.

AMSAT-UK will have a team member at the launch site during the launch campaign and intend to provide regular updates during the lead up to August 25th so keep a watch on the AMSAT-UK web site for the latest information.

Suitsat project nears completion

Frank H. Bauer, KA3HDO holds the positions of ARISS International Chairman and AMSAT V.P. for Human Spaceflight Programs. Frank recently posted this message to the AMSAT-NA bulletin board. It concerns the hastily prepared "Suitsat" project.

"I am proud to announce that today (10th June) the ARISS-US team has delivered their portion of the Suitsat hardware to the NASA Johnson Space Centre.

NASA is in the process of shipping this hardware to Energia in Russia where it is expected to be certified and integrated with the Russian team's Suitsat equipment for eventual launch on the 19P Progress launch vehicle in the August/September 2005 timeframe.

The Suitsat amateur radio system, coupled with a school artwork DVD project that will be delivered later this month, is planned to be installed in an outdated Russian Orlon spacesuit in late September. It will then be deployed from the ISS during a spacewalk.

The Suitsat amateur radio system will beam down special messages and an SSTV image from within the Orlon space suit as it floats in space. Suitsat radio system will allow hams and students to track the suit and decode special international messages, space suit telemetry, and a pre-programmed Slow Scan TV image through its specially-built digital voice messaging system and amateur radio transmitter. As built, Suitsat will be a transmit-only capability that will run on the space suit's battery power.

The idea for Suitsat was first conceived by the ARISS-Russia team, led by Sergey Samburov, RV3DR, and was extensively discussed at the joint AMSAT Symposium/ARISS International Partner meeting in October 2004. The project is being led by project manager A. P. Alexandrov and Deputy Project Manager A. Poleshuk from RSC Energia, located in Korolev (Moscow area) Russia.

On the US side, the hardware project development was led by Lou McFadin, W5DID. Since October 2004 the Suitsat design concept matured and evolved due to the challenging development time constraints. A joint NASA letter, allowing the ARISS team to proceed forward with the Suitsat project was signed on May 10, 2005. In the four short weeks since that letter was signed, the US project team, has designed, built and tested a simple, yet fully featured system that we hope will inspire hams and students around the world.

On behalf of the ARISS International team, I want to congratulate the Suitsat hardware development team for their "Can Do" spirit and ability to deliver the Suitsat hardware on such a very challenging schedule". Thanks Frank and our congratulations also go to the team. Nice work. This project, along with PCsat2 will concentrate a lot of interest on the ISS in the next couple of months.

Keep watching the AMSAT-NA web site and news services for further developments in all the above exciting and challenging projects.

ar

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

Hamads *classifieds* FREE

FOR SALE NSW

• Wooden German Morse key, $80. Electronic keyer 1965 Heathkit HD-10. Has built-in single keying paddle and sidetone speaker. Uses 120 V, therefore comes with 240/120 V stepdown transformer, Europe/USA adaptor and instruction manual, $100. Electronic keyer 1965 Dentsu-Seiki DA-1. Comes with instruction sheet, $100. All in excellent working order. Photos on request. Phone 02 4237 5201 email hermanw@smartchat.net.au.

• 4 Mobile Helicals, 10, 20, 40, 80 m; 2 spring mounts; 1 long 20 m helical; 2 gutter grips; $100 total; Panasonic KX-P1180 Printer, $10; 2 x FM-828A, $15 ea; 4 x LDF4-50 female N connectors, new; $15 ea; 8 metres LDF5-50 coax, $20; 6.5 metres LDF 4-50 coax, $10; Roger Woodward, VK2DNX, Rogerwoodward10@hotmail.com, 02 9547 2546.

• Yaesu FT-707 HF rig, GaAs FET modified front end and matching 20 A power supply. Good working order when last powered up a few years ago, $600 ONO. Werner Wulf 6 metre 5 el beam $100. Steve VK2ZSC 02 9626 7667.

• Shack clearout: Kenpro KR-5600 Az-El Controller $850. Azden PCS-5000 2 m xcvr $450. Kenwood TR-9130 2 m all-mode xcvr $300. Icom IC-490 70 cm all-mode xcvr $550, Kenwood TS-430S HF xcvr $450. Alinco DM130MVZ 20A power supply $350. Emtronics EPS-30 25A power supply $400. Tono 5000E keyer/modem $600. Icom IC-735 HF xcvr & AT-150 ATU $850. Icom IC-505 6 m all-mode xcvr $450. Icom IC-726 HF & 6 m xcvr $800. Tokyo Hi-Power HL-160V 2 m amp $600. Tokyo Hi-Power HL-82V 2 m amp $250. Emtronics EAT-300 ATU $300. Home-brew 10-160 m amp. 2 X 3-500Z tubes $900. Jumbo HP-240DX 100W HF amp $50. Assorted audio oscillator, signal generator, spectrum analyser. VK2CAN, phone 02 9871 4872.

WANTED NSW

• FT-290R sub board part number PB2236 Horrie VK2LY. Phone 02 9874 5050.

FOR SALE VIC

• Amateur Radio and Vintage Radio equipment. Many items ex the estate of Laurie VK3KL. Amateur gear mostly Kenwood VHF and UHF transceivers, which are priced to sell at the Shepparton Communications Day 11th September 2005. Vintage radio equipment including Gecophone 900 mm diameter loop antenna also for sale. Rodney VK3UG QTHR Phone 03 5825 1354.

• Heathkit Test Equipment. Test Oscillator model TO-1. Resistance Capacitance Bridge model C-3U. Television Alignment Generator model TS-4A. Laboratory Oscilloscope model O-12U. GDO model GD-1B c/w 7 coils. Rod VK3AYQ QTHR Phone 03 5243 2737.

• Marconi TF2304 AM/FM fully automatic portable modulation meter. Covers 9-12 and 18-1000 MHz. Inbuilt battery for portable use. Top condition with manual, $330. Email for more details and pics. Terry VK3ZXY QTHR. email to vk3zxy@leithy.com.

• Satellite System: Brand New all components in original cartons. 3.6 m Orbitron Mesh Dish with polar mount. 60 cm Actuator Arm. Echostar 8700 Analog Rec/Positioner with RF control. Chaparral Micropak 25 Degree C Band LNB and Feed Horn. 26 m RG-11, 26 m each of 3 core and 7 core control cable. All instruction and assembly manuals. Buyer to collect. Inspection can be arranged. Originally cost $2450, make a reasonable offer. Contact Keith, Phone 03 5243 518. Geelong Radio & Electronics Society VK3ANR

WANTED VIC

• Wanted urgently: B&W TV Turret Tuner type NT 3001 For Kriesler 79-3 B&W TV. Uses Valves 6BL8, and 6ES8. Please check your Junk Boxes. Anthony VK3JIA QTHR. Phone 03 9728 4305, or vk3jia@tpg.com.au.

WANTED WA

• Schurr Profi Iambic CW paddle. Good condition. Wanted by enthusiastic CW operator. Steve Ireland, VK6VZ, Phone 08 9298 9330, email: vk6vz@arach.net.au.

WANTED TAS

• 3-500Z tubes, prefer pair but will consider all. Reply to VK7ZOO on Phone or fax 03 6376 1419.

MISCELLABNEOUS

• The WIA QSL Collection requires QSLs. All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

About hamads....

- Hamads may be submitted by **email (preferred)** or on the **form on the reverse of your current Amateur Radio address flysheet**. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are pre-payable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newunltd@bigpond.net.au*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793.* **Fax:** *03 9756 7031*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

ADVERTISERS INDEX

AEI	15	Nlue	IBC
Andrews	49	Ozgear	23
Benelec	IFC	TTS	8
Com-an-tena	9	Small ads	51
TET-Emtron	22	VK Discounts	51
G & C	17	Winlink	17
Icom	OBC	www.vk3ajj.com	51

Over to you

WIA Membership costs

Great to see new WIA membership category introduced for family membership. But when the WIA changed to a national body the idea was to make the unit more streamlined cost affective and reduce costs to members. Yet the fees increased for the pensioner.

Previously $55.00 covered full membership, magazine and use of the QSL section. Now I pay $70.00 membership (with magazine) plus $20.00 to use the W.I.A QSL section (Vic branch) for the next two years. I know of members dropping out of the WIA because of these increases, and believe it could become wide spread if these type of increases continue.

Alan VK3VD
tfolstne@melbpc.org.au

The other side of the Tasman in the 160 m contest

This e-mail, was sent to me after the 160 m Contest, held 9th July.

Hello there

Just a wee note to say that our ZL2AS team had a great weekend operating in this 160m ZL - VK Event and thank you. Our log of 189 (over 6 hrs), contacts will follow soon.

For the record we had 3 operators (using NZART Br 13 callsign of ZL2AS) at our remote site (10 km from mains power at Cape Kidnappers, east of Hastings on the east coast of the Nth Island) and ran our 100 W from batteries only.

We had a rope suspended across a ½ km valley and attached our 240 m long collinear antenna to the rope. The rope was anchored on one hill top end the other end ran through a pulley on the other hill top and back down the side of the hill to a vehicle, we fitted the antenna to the rope and drove the vehicle away and up went the antenna, about 35m above the ground.

Tnx again and good luck to every participant.

73 from the "ZL2AS Team" (David ZL2DW, Mike ZL2VM, Colin ZL2CF)

Bruce Renn VK3JWZ
Contest Manager

The views expressed in the *Over to you* column are those of the authors, and do not necessarily reflect the official policy of the Wireless Institute of Australia.

Silent key

Reginald Talbot Busch VK3LS

28 1 1907 to 11 6 2005

Reg was born 29 January 1907 and lived his life in the North Western suburbs of Melbourne Moonee Ponds and Strathmore, after he married Hilda.

Amateur Radio licence VK 3 LS was gained in 1923 and he held this call all his life. As a member of the Air Force Wireless Reserve before the 1939 war, he volunteered at the outbreak of the war, but as he was an Engineer (Communications) with the State Electricity Commission he was classified Reserved. However he still served for the R.A.A.F. and taught Radio Theory at the Working Men's College (Now R.M.I.T.) part time.

Reg helped with the establishment of the Amateur Radio Emergency Network (precursor of W.I.C.E.N.) which was formed about 1950, the time of the big floods in the Hunter Valley N.S.W. This network operated BELOW the 40 metre Amateur Band

An Honorary Member of the I.R.E.E. and Honorary Member of the W.I.A. this certificate adorned the T.V. in his nursing home room. He served as Treasurer of the Victorian Division Of the W.I.A. about the time they shifted from Victoria Street Offices and was very diligent in these operations.

As an enthusiastic operator he built much equipment right up to the time of his death. One such unit was the Dick Smith Explorer 433 Meg transceiver and he was trying out a new 433 Meg antenna as late as December last year.

He was also a regular operator on the early morning 144 net in the Coburg area, which was held every day. He enjoyed the contacts as he lived alone for the last years of his life after Hilda, passed away and they had no children. His two nephews and families Ray & Alan Horsley will miss him greatly.

He had a fall just after his 98th birthday and entered John Faulkner Hospital from

Reg Busch VK3LS at the age of 98

where he transferred to the Roxburgh Nursing Centre. When visited he would still be enthusiastic about radio and liked to remember the good old days. He passed away quietly on Saturday 11th June 2003.

73 Reg from VK3SM, Allen, VK3NP, Don, VK3BKN, Jack and VK3BYE, Len. The remaining members of our net.

Allen VK3SM

DXCC standings

Mai. VK6LC

(335 entities) (30th. June. 2005)

Callsign	Countries
DXCC Ex.(335)Phone	
VK5MS	335/389
VK4LC	335/382
VE6VK	335/372
VK4UA	335/370
VK5WO	335/368
VK6LK	335/360
VK3AMK	335/354
VK3QI	335/349
VK3AKK	335/348
VK2FGI	335/341
VK3DYL	335/341
VK3EW	335/341
VK3SX	335/341
Honour Roll(326)Phone	
VK6HD	334/360
VK6NE	333/349
VK2AVZ	333/344
VK1ZL	333/339
VK2DEJ	333/339
CT1EEN	332/336
VK3TZ	332/336
VK3OT	331/345
VK4OH	330/337
VK6APK	330/335
VK4AAR	330/334
VK3CSR	329/338
VK3YJ	327/333
VK5FV	326/329
General listing-Phone	
VK4SJ	325/326
VK7BC	324/329
EA3AKN	323/331
VK3EUZ	323/324
VK6ABS	322/000
VK2UK	320/325
VK4LV	319/321
VK1TX	319/000
VK6RO	312/319
VK3JI	310/325
PY2DBU	308/315
VK6LC	308/311
VK4ICU	303/305
VK6DY	297/301
JA3EY	296/300
VK4EJ	296/298
DL1TC	294/295
VK2CSZ	290/293
VK2HV	288/000
VK4BAY	287/290
VK7TS	285/286
9V1RH	283/285
VK3KE	282/285
VK6ANC	281/285
VK3DP	274/277

Callsign	Countries
General listing-Phone	
VK8DK	253/254
VK2FHN	243/000
VK4AO	240/000
VK8KTC	231/233
UA6LDD	225/226
VK8AM	225/000
VK4IL	212/000
VK2JAU	210/000
VK3DVT	206/209
VK6BH	200/000
VK2EO	195/000
VK6RZ	187/190
VK7JAB	186/000
G0VXX	184/000
VK3PA	178/179
VK6EH	170/000
VK2EJK	169/000
VK4CHB	167/168
VK2BQS	166/169
VK5EMI	160/000
VK4ARB	159/160
JA6KTY	156/000
DL6USA	153/000
VK2GSN	152/000
VK6HZ	151/000
VK7LUV	148/000
VK2SPS	143/145
VK2QV	141/000
VK3JXO	141/000
VK8LC	137/000
OK1ZSV	136/000
DL9UBF	133/134
SV1XV	130/131
VK4FNQ	130/000
VK4VIS	127/129
VK5ATU	126/128
VK2IRP	125/101
CU3AAT	125/000
TG8NE	125/000
VK2VZQ	122/000
VK4EZ	119/125
VK2MH	116/118
VK5UO	112/115
VK3CML	109/000
VK3MRG	108/000
AX4EJ	105/000
SV1EOS	105/000
VK9RS	104/000
3W2LC	102/000
SV1FTY	102/000
SV1GYG	102/000
VK6ISL	102/000
VK3KTO	101/102
HS1NGR	101/000

Callsign	Countries
General listing-CW	
VK6RZ	315/320
VK3AKK	312/317
VK3KS	307/335
VK4LV	299/306
CT1EEN	294/000
VK4ICU	291/000
VK3JI	274/299
VK6MK	249/252
VK7BC	246/255
VK2CWS	245/247
VK3DP	245/247
VK4DA	237/239
VK3CIM	235/236
RD3AF	233/000
VK7TS	219/000
DL7PA	203/000
VK6RO	196/198
PY2DBU	179/181
VK3KE	176/000
VK4CXQ	174/000
VK5UO	171/172
DK6AP	168/000
VK4UA	151/164
DL6USA	151/000
VK4AAR	144/146
VK8AM	138/000
N0TM	135/000
DL1TC	133/000
VK7DQ	131/132
DL6UGF	126/000
DJ4BG	121/000
K5QNM	110/113
VK5BWW	110/113
SM6GZN	110/111
T94VT	108/000
UR5BCJ	103/105
DL3GDS	102/000
DXCC Ex.(335)Open	
VK4LC	335/382
VE6VK	335/380
VK4UA	335/372
VK5WO	335/372
VK6HD	335/362
VK3AMK	335/354
VK3QI	335/350
VK3AKK	335/348
VK3EW	335/341
Honour Roll(326)Open	
VK3OT	334/348
VK7BC	334/343
VK2AVZ	333/344
CT1EEN	333/337
VK3UY	333/336
VK2UK	332/337

Callsign	Countries
General listing-Open	
VK4ICU	311/313
VK6LC	309/312
VK3DP	305/308
DL1TC	302/303
VK7TS	295/296
PY2DBU	294/298
VK3KE	292/295
VK2HV	289/000
VK3CIM	284/288
VK6ANC	283/287
UA6LDD	279/280
VK3VQ	276/293
VK3JMB	259/000
VK6MK	256/259
VK8NSB	256/000
VK5UO	251/255
VK2CWS	251/253
VK2FHN	247/000
VK4DA	237/239
VK8AM	236/000
DL6USA	190/000
VK3PA	187/188
VK2BQS	183/186
VK4CXQ	179/000
VK4CHB	177/179
DL6UGF	161/000
VK5ATU	158/160
VK3VB	153/155
VK6HZ	151/000
DL9UBF	150/152
VK3JXO	146/000
VK2SPS	144/145
SV1XV	142/144
VK4EZ	140/147
ON9MCR	129/140
VK3OZ	126/127
VK7CQ	123/125
N0MSB	117/000
VK9RS	111/000
VK2AJE	109/000
VK3MRG	109/000
UA0IGV	103/000
RA3BZ	100/000
General listing-RTTY	
VK3EBP	253/255
VK3AMK	200/202
VK3KE	163/000
VK2BQS	126/128
SP3CUG	124/000
CT1EEN	110/000
VK5RY	100/102
Gen-listing 6m. Open	
VK4FNQ	137/000
CT1EEN	110/000

VK2CA	271/000	VK1PRG	101/000	VK4AAR	332/336	VK4ABW	109/000
VK3UY	264/266	VK5JAZ	100/000	PY2DBU	328/343	VK6JQ	103/104
VK3VQ	261/278	DXCC Ex.(335)CW		General listing-Open		VK4CXQ	101/000
JA7MGP	260/000	Honour Roll(326)CW		VK4LV	323/331	Gen-listing-Satellite	
VK2XH	257/000	VK6HD	334/355	VK6RZ	323/329	VR2XMT	112/114
VK8NSB	255/000	VK3QI	334/346	VK3JI	322/351	VK3XDQ	106/000
VK3JMB	255/000	VK5WO	332/348	VK6RO	321/328	General listing-SWL	
VK3CIM	254/258	VE6VK	329/356	VK4DV	314/329	DE2DAD	100/000

Awards information and down loadable files are available on our WIA website
http://vk6.net/WIA-Awards/HTML/01-wia-awards-index-home.html or email to:awards@wia.org.au
or W.I.A. Awards Manager P.O.Box 196. Cannington. Western Australia. 6987.
Mal. VK6LC

Award

The Fathers of the Radio

Erminio Cioffi Squitiari

Rules

The section ARI of Sala Consilina (SA) ITALY, has founded the permanent award "The fathers of the radio". The purpose of the diploma is to recognise the names and the work of those who before, during and after the Our Guglielmo Marconi contributed to the invention and the development of the Radio.

General requirements - Awards are available to all amateurs and SWLs for worked or heard all the 11 countries of the following list where were born the scientists/inventors who have contributed to the invention or the development of the radio.

Bands and Modes – All the bands assigned to the Radio Amateur Service and all the modes are allowed, satellites and WARC included.

There are 4 versions of the award:

1) HF (you must have contacted all the 11 countries)
2) 50MHZ/VHF/UHF (6 countries are enough)
3) SATELLITE (6 countries are enough)

Countries list:

Canada VE (Reginald Fessenden)
Croazia 9A (Nikola Tesla)
Denmark OZ (Hans Christian Orsted)
France F (Edouard Branly)
Germany DF-DK-DL-DM (Heinrich Rudolf Hertz – Karl Ferdinand Braun – Adolf Slaby)
India VU (Jagdish Chandra Bose)
England G-M (Michael Faraday – Oliver Lodge)
Italy I (Guglielmo Marconi – Augusto Righi – Temistocle Calzecchi Onesti – Luigi Galvani)
Russia RA-RZ UA-UZ (Aleksandr Popov)
Scotland GM (James Clerk Maxwell)
USA A-K-N-W (Samuel Morse - David E. Hughes – Lee De Forest – Nathan Stubblefield)

To claim the Award the QSL cards are not required but they must be in possession of the applicant and could be requested anytime for checks.

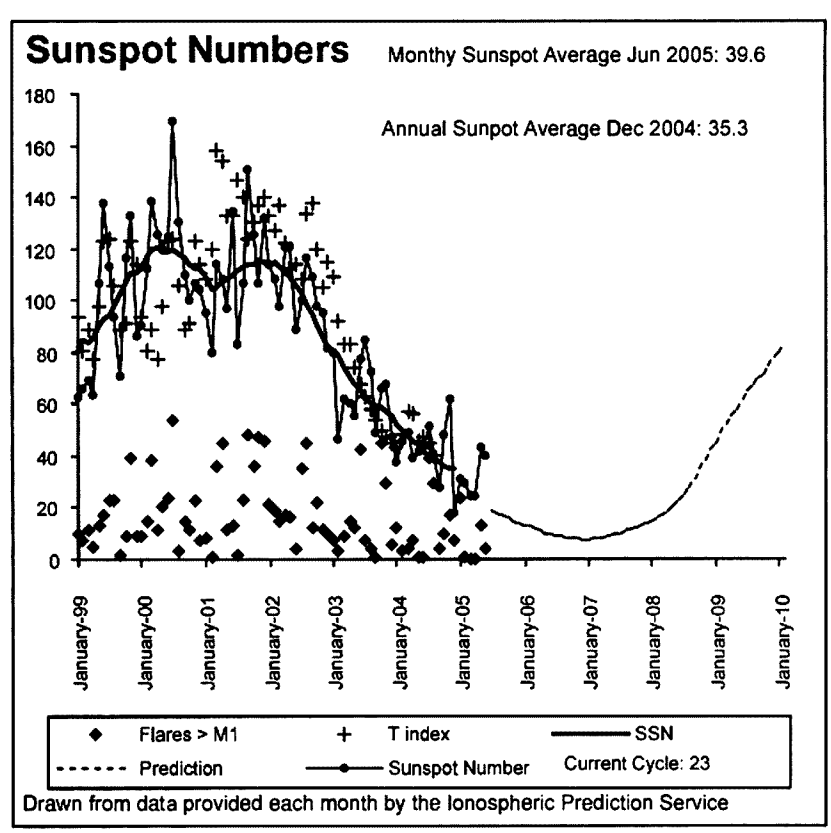
The fee is 10 Euro or 12 Dollars. To receive the Award as registered mail please add 3 Euro or 4 Dollars.

Application forms must be sent to this address:

Ari Sezione Sala Consilina
Casella Postale N.11
Cap 84036 Sala Consilina (Sa)
Italy

For more information you can contact the award manager IZ8AJQ Erminio via email: iz8ajq@amsat.org <mailto: iz8ajq@amsat.org>

ar



DX news & views

VK4OQ,
P.O. Box 7665, Toowoomba Mail Centre, QLD 4352.
Email: john.bazley@bigpond.com

QSLing–an activity that goes back to the very roots of amateur radio

Is it a chore or a pleasure? It comes down to how active you are and if you are interested in obtaining confirmation of some or all of your contacts.

The major DXpeditions these days produce interesting QSL cards containing a lot of local information with some excellent photographs. A far cry from the attempt by a well known DXpeditioner in the late 1960s to cut down on the amount of incoming paper, and the necessity of printing cards, decided to literally 'rubber stamp' the incoming card confirming the contact and returning the card to sender. It was far from popular and soon stopped!But then that raises the question 'what do we want the QSL card for'? If it is just to get confirmation for DXCC then does the quality or type of card really matter? With the introduction of L.O.T.W. will the need for QSLs eventually disappear? I think not.

In recent years the whole concept of QSLing has changed. Some DXpeditions will accept (actually encourage) email requests for QSLs, which are then sent via the bureau saving the handling of incoming paper and the expense of sending, and including reply paid postage. Others print out all the QSLs – extract the direct requests and then after a period of say 9 months put the residue into the bureau. Note the role of 'The Buro'. This gives me an opportunity to say 'thank you' to all those volunteers who process our cards for us, the magic 'they' who sort QSLs for us.

Now to DX News

The CY9SS St Paul Island DXpedition commenced on time after a very difficult start. The landing by the CY9SS crew on St. Paul Island was, to quote Robby VY2SS, "very, very rough", so rough they lost a generator and three tower sections overboard during landing. All the operators at that time were OK other than being cold, wet and tired. The boat captain, Robert, hurt his leg during the landing and was in much pain, but managed to get all gear unloaded. High winds and rain hampered efforts to set up camp. K1LZ, Krassy, broke a leg. He had to be airlifted to Cape Breton Regional Hospital in Sydney, Nova Scotia. The accident happened while installing a 160 m antenna. A tower guy let loose while Krassy was on the tower and he fell 50 feet. In addition to the leg break above the knee near the hip Krassy had slight concussion. Krassy's other leg was also severely bruised and he has been immobilized so things can heal, but doctors are optimistic about his recovery.

Alan VK6BN emailed to say that he returned to Australia on 11th May after three years of activity as SU9BN from the **Sinai, Egypt.** His QSL Manager is Fran EA7FTR. Thanks Alan.

The **Peter I DXpedition** is now scheduled for early 2006. Contracts have been signed with two Chilean companies to provide a vessel and helicopter for the DXpedition during January/February 2006. The actual dates of the operation will be released about September 1, 2005, but the general time frame will be between January 16 and the end of February, 2006. The actual dates depend on the vessel scheduling and weather considerations.

It is the team's objective to be at Peter I for at least two weeks, the actual operating time to be determined by weather and set-up time. Because of the likelihood of it being a long time before Peter I will be activated again, they have set some very high QSO goals.

Nine stations will be established on the island and QRV on all bands 160-10 m, on the most common communications modes.

Most of the members of the 2005 team will participate in the 2006 DXpedition, but there are several slots available for new team members. Contact either: K4UEE (mallphin@aol.com) or K0IR (rfedor@cloudnet.com) for more information. This adventure is not for the faint-hearted!

Sponsors from the 2005 attempt are on board for 2006 - see www.peterone.com for a complete list.

Email from **Allan Greening VK3PA** has drawn my attention to a monthly report of DX worked and heard on 80 metres. Allan suggests the best time to check is the last day of the month at www.VK3PA.com/forum. Many thanks Allan.

Harry 7Q7HB is once again in **Malawi** for about three months. He has a heavy work schedule and will operate in his spare time. Note: direct QSLs only to G0IAS.

Tony IK8VRH reports he has changed his plans for his August **IOTA** activity from **Greece.** He now expects to operate as SV/IK8VRH from the following islands and lighthouses:

10-12 August	Kavalliani	EU-060
13-14 August	Dokos	EU-075 (ARLHS GRE-059)
16-17 August	Elafonisos	EU-113
19-20 August	Sapientza	EU-158 (ARLHS GRE-116)
21-28 August	Spetses	EU-075 (ARLHS GRE-063)

F6FVX will be active as TY/F6FVX from **Benin** between 13th August and 6th September. He will operate on the HF bands and will be speaking French.

PY0F/EA2RC and PY0F/CT1BWW will active from **Fernando de Noronha** (SA-003) from 1st August to 14th August.

Further information can be found at http://www.geocities.com/EA2RC/index.htm

The DXpedition to **Jagoi Gunung**, a Dayak village in Sarawak by Sengchai Chan 9M8SC, planned for June has been postponed until 31 August.

Don't forget the planned trip to **Kure** KH7C from September 24th to 8th October. Four stations will be active. Operators will be KK6EK, NI6T, N6MZ, N0AX, N7CQQ, W6KK, DJ9ZB, I8NHJ, K6SRZ, K6DZL.

Comments, news and views please by September 8th for October *Amateur Radio.*

Special thanks to the authors of --- *The Daily DX* (W3UR), 425 *Dx News* (I1JQJ) and *QTC* DX PY2AA for information appearing in this month's *DX News & Views.*

ar

NIUE: Dxer's Delight

or:

How to have a DX adventure while enhancing marital bliss

Murray Lycan, VE7HA

As I surfed the Internet one day, spending extra time at one of my favourite websites www.dxholiday.com, I called to my wife: "Konomi, how would you like to lounge at a tropical bungalow and eat papaya while I operated Ham radio"? After 19 years of marriage, I know how to get a reaction from my wife.

"We can pop down to the Caribbean for just US$1600 a week to stay at a house with Ham radio plus US$2000 airfare plus transfers, plus food ....." I added. My voice trailed into silence since I wasn't even convincing myself this was a viable idea at these prices. For a single week of tropical glory, this was going to cost me more than a brand new Alpha 99 amplifier. No reply from Konomi. I thought I better shut up in case she actually thought this was a good idea. There has to be a better way, I thought, that is affordable yet provides the tropical sun my wife loves and me the opportunity to operate from a spot high on the DX Most Wanted List.

Another website stated boldly: "Niue offers you the chance to experience your dreams". I knew about Niue ZK2 but I had always thought it was difficult to reach since it isn't on the main airline routes. Besides, everybody must have worked ZK2 by now. But as I checked further, I discovered Niue is a quick non-stop jet flight of about three hours from Auckland. Plus Niue was actually quite high on the list of DX wanted entities especially in Europe since there are virtually no active resident Hams.

Over the weeks following, I learned a great deal about Niue. I learned Niue is the only country that offers free wireless Internet access to all residents and visitors. I learned that a Ham licence can be obtained on the spot for a modest NZ$20 payment plus presentation of a valid home licence. No hassle; the telecom authorities even allow some choice of callsign. I chose ZK2HA to match my home call suffix. I learned that accommodation, though not plentiful, is adequate for the number of visitors to the island and varies from resort class accommodation to cozy bungalows. And prices are particularly reasonable, especially for a longer stay. Equally important to me, every email that I sent to different Niue businesses with inquiries was answered promptly, politely and with a friendly inviting tone. Too good to be true in Year 2005?

As I write this after spending five weeks in Niue, I can confirm that everything mentioned above is true. Without exaggerating, Niue may be one of the best locations overall to visit for a Ham interested in being on the other side of the pileups while simultaneously satisfying a travel partner who may not have the same appreciation for DXing as yourself. Our time spent in our comfortable Namukulu Motel bungalow was really like a home away from home with hosts Robin and Joe Wright taking care of any need we had. If you do happen to go to Niue, take along a bottle or two of tonic water, pass them to Robin and Joe, and tell them they're from me. They'll understand.

Though our five weeks on island were spent casually offering QSOs to the deserving between other activities, each time I fired up the TS-690S with only 100 watts and a Steppir BigglR vertical attached, I quickly became buried under a pileup. A lot of operators still want ZK2! And this was on SSB. Judging from emails received, operations on CW, PSK, RTTY, etc. are even more in demand. An operator with a bit of transmit power and a little antenna gain would be very busy for as long as they wanted. As for contest operating, I personally experienced the big gun multi-multis calling me (for a change) and expressing their gratitude for the new multiplier.

Without exaggerating, Niue may be one of the best locations overall to visit for a Ham interested in being on the other side of the pileups, while simultaneously satisfying a travel partner who may not have the same appreciation for DXing as yourself.

My one mistake I made was not realizing in advance the intensity and desire that many Hams around the world have to get a QSO with ZK2. Next time I visit ZK2, I will go better prepared equipment-wise and personally psych myself up to meet this demand.

When not playing radio, we enjoyed visiting Alofi that is the town where the 1300 full-time Niuean residents obtain their supplies, work at their jobs and meet friends. With our rental car, we explored all sections of the island via the paved road that circumnavigates the country. Even though some evidence can be seen of horrific Cyclone Heta that struck in January 2004, most damage has either been repaired now or is in the process of being repaired. An example of this is the new hospital under construction to replace the storm damaged old hospital. A visitor is not inconvenienced any longer by the destruction delivered by that nightmare storm.

If you are looking for a holiday destination that will satisfy the wife, the kids, literally anybody in your family plus give you the opportunity to enjoy being DX from an electrically quiet paradise without pushing you into bankruptcy, visit www.niueisland.com and ask yourself: "Why not us"?

ar

Murray Lycan, VE7HA (ex-7J1AQH) has been licensed for over 33 years and has operated from 12 different countries. He and wife Konomi enjoy asking the question: Where do we go next? For now, the answer is to the Sunshine Coast of British Columbia to a new log home equipped with a good Ham station that will allow a contact with needed ZK2. Feel free to send any questions regarding operating from ZK2 to Murray at ve7ha@arrl.net.

ZK2HA Niue Island

Murray Lycan, VE7HA
401-9633 Manchester Drive
Burnaby BC V3N 4Y9 Canada

ITU Zone: 62
CQ Zone: 32
Grid Loc:AH50ax
IOTA OC-040

To Radio

Date	UTC	MHz	2-Way	RST

Rig: Kenwood TS-690S
Ant: Steppir BigIR vertical @ 10 feet high, 100 m from ocean

Niue is a peaceful and friendly independent island nation with 1300 full-time residents. Easily reached by a 3-hour jet flight from New Zealand, Niue boasts the perfect environment for a casual DXpedition guaranteed to produce pileups. Check

❑ Pse QSL Tnx ❑

ICOM'S GREAT CHAMPIONS

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shape • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706.

Now includes 70cm @ 20W and 50W on 2m Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch Detachable Front Panel (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied:HM133.

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495 KHz - 1 GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

ICOM

find your nearest ICOM dealer at

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

www.icom.net.au or (03) 9549 7500

PH416_AM02

Volume 73 No 9
September 2005

Amateur Radio

$6.50
incl GST

WIRELESS INSTITUTE OF AUSTRALIA

The magazine for AUSTRALIAN radio amateurs

High adventure

operating in Bogong High Plains

plus

The secret radio in concentration camp 1942–1945
Arnivan der Harst, VK5XV

Antenna booster for hand-held scanners
Ron Holmes VK5VH

An HF – 6 metre antenna diplexer
Keith Gooley VK5OQ

The 2002 DFD updated
Phil Rice VK3BHR

Practical HF broadband wire antennas
Marc Robinson VK2BUA

9 770002 685093 09

BENELEC

YAESU

VX-170

Rugged new VX-170 of 2 m Hand-Helds is tough, submersible, has a huge easy-to-read LCD, and provides big, bold audio (700mW) from the huge internal speaker.

- Ultra rugged 5W 2m Hand-Helds
- Expanded RX Coverage: 137-174 MHz
- Long Life 1400 mAh NiMH Battery Pack supplied
- Enhanched Paging and Code Squelch
- User Password protects against unauthorised use
- Dedicated Weather Band Channels with Severe Weather Alert Scan
-200 Memories with Labeling and 10 Memory Groups

Price $ 282.70

Big 700 mW Audio!

Huge LCD

1400 mAh Long Life Battery

Vertical HF Broadband Antenna

CHA250B

Specifications

Amateur Bands Covers	6,10,12,15,17,20,30,40 & 75/80 metres
Transmit Frequency Range	3.5 to 57 MHz
Receive Frequency Range	2.0 to 90 MHz
VSWR	<1.5:1 (Typical)
Maximum Height	7.13m
Weight	3.20Kg
Wind Survival	108 Kmph
Transmit Power Rating	250 Watts SSB & 125 Watts FM
Impedance	50Ω
Termination	UHFs
Mounting Pole Ø	28 - 54mm
Country of Origin	Japan

FT-7800R

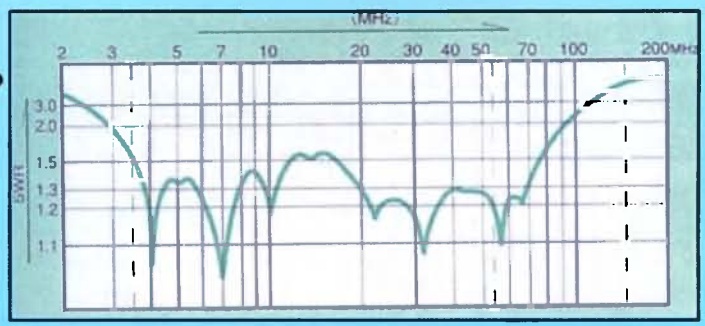
2m / 70cm Dual Band FM Transceiver

- High Power Output
- Wide Receiver Coverage
- Five One-Touch "Hyper Memory"
- Over 1000 Memory Channels

Price $ 506.00

VSWR

Price $ 742.50



All Price includes GST

Benelec Approved Amateur Transceiver Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosound.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
sales@strictlyham.com.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

Ozhelp Services
Tel: 07 3273 7263
sales@ozgear.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8285 2400
brenton@posnav.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 9
September 2005

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Publications Committee Members

Brenda Edmonds	VK3KT
Ron Fisher	VK3OM
Don Jackson	VK3DBB
Evan Jarman	VK3ANI
Tom Potter	VK3UBS
Bill Roper	VK3BR

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Remembrance Day

Governor General's address 12

RD Reminiscing 12
Joy Stevens

Alpine Radio 13
Stephen Warrillow VK3JNH

The secret radio in concentration camp 1942–1945 17
Arn van der Harst, VK5XV

Antenna booster for hand-held scanners 19
Ron Holmes VK5VH

The development of radios in the Flying Doctor Service. Part 2 48
Rodney Champness VK3UG

TECHNICAL

A dual band CW transceiver Part 2 5
Dale Hughes VK2DSH

An HF – 6 metre antenna diplexer 21
Keith Gooley VK5OQ

The 2002 DFD updated 24
Phil Rice VK3BHR

Practical HF broadband wire antennas 26
Marc Robinson VK2BUA

Notes on HF transmitting coils 29
Drew Diamond VK3XU

A portable inverted V antenna (Technical abstracts) 38
Peter Gibson VK3AZL

COLUMNS

ALARA 32
AMSAT 38
Award 54
Beyond our shores 31
Contests 41
Directory 56
DX~ News & Views 40
Editorial comment 2
Hamads 54
HF predictions 52
News from... 34
VK2 34
VK5 35
VK7 35
Silent keys 34, 35, 37
Sunspots 33
Spotlight on SWLing 33
Technical Abstracts 36
VHF/UHF – an expanding world 46
WIA comment 3
WIA news 4

Our Cover this month

A group of intrepid adventurers brave Victoria's High Country for a winter DXpedition. Read Stephen VK3JNH's story on page 13

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

Judith Oliver	Office Coordinator
Emma Treblico	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
Assistant Treasurer	Bruce Bathols	VK3UV

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial		
FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3		
Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	Glenn Dunstan	VK4DU
International		
Travel Host	John Miller	VK3DJM
ITU Conference and		
study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK8NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glenn Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

Tidying up

Well the Toyota Rally of SA has been run, I have been tidying up in the dark on Saturday evening and setting up in the dark on Sunday morning (@#$#@ cold!). Did not have to say nasty words, as all worked well. On the side though, got back to overnight accommodation, could not find mobile phone, all very dark, borrowed another phone went to the Beetle and rang my phone, it answered, so I knew I had not lost it, just mislaid it. However it was the following morning as I unpacked the gear before I actually found it!

WICEN SA and the Rally organisers are all very pleased with whole operation. I would like some short notes and pictures from other states on WICEN operations or exercises. However readers are not really interested so much in Jim and Bill, as they are in the equipment and any novel solutions to problems. So please bear this in mind when you select the pictures.

I am glad to see that the WIA organisation has the new examination system in motion and that we should be able to stage new style exams in a month or two. It will be very interesting to see where the first Foundation licence is issued. I would like details and a picture for the magazine.

The RD contest really buzzed this year. Unfortunately I was only able to sit in the shack for a couple of hours over Saturday and Sunday. I was quite surprised to hear numbers near or just over 500 late on Sunday. The new format certainly provided more contacts. The rework rule would have helped but the operators still have to spend time to work the calls. I'm sure some slept well into Monday after their long stints. Congratulations to all who participated. Now please write up the log and send it in. I have decided to look at computer logging (Ian Godsil VK3JS sparked me into action). There was a good program from John Dean, VK5DJ, download from http://vk5dj.mountgambier.org . I did not have a laptop to take out to the shack to sit beside the transceiver. Not much room in my shed, certainly not for a big box and monitor. Fortunately I now have an not too old Toshiba Satellite Pro with a battery that will work for a few hours so I have run out of excuses for the Oceania Contest. All I have to do now is choose an appropriate logging program I can relate to. I have looked at EI5DI's site www.ei5di.com and downloaded the SD programs. There are 17 pages in the manual but the programs cover a lot of specific contests as well as a general logging program for HF and another for VHF contests. So now I am reading and playing to get the feel before I try it on in a real contest.

Good luck with all your amateur radio activities. Remember to keep experimenting and make the odd mistake because I have been told, "If you never make a mistake you never make anything!"

73 Colwyn VK5UE.

September events

ALARAMEET
9th to 12th September 2005
http://users.ncable.com.au/gsyme/AlaraMeet/

2005 Wadda Cup Contest
24 September, 2005

Michael Owen VK3KI

The system develops

It was last December that I first wrote about moving to a competency based training of accredited assessors, asking the question, what do you think?

By April, when I next wrote about it, I had become convinced that the ability to undertake practical assessments and to provide candidates with an immediate result and immediate guidance where further work was needed to achieve competency had surprising support, even though for most aspiring assessors it meant giving up a full weekend.

Last month I was able to say that the WIA was going ahead to accredit assessors, with the assurance of the ACMA that certificates of proficiency would be issued on qualification by the WIA on the basis of certification by WIA accredited assessors.

We have now finalised the two basic documents describing the system. The first describes the general principles and the qualification and accreditation procedure and is called "WIA Exam Service Assessment Process in Amateur Radio" and replaces the "Assessment of Competency in Amateur Radio" March 2005.

The other, which parallels the existing WIA Exam Service Instructions, is called the "WIA Exam Service Assessment Instructions". Both are on the WIA website.

It is a basic principle of the assessment system that the assessors must be fully familiar with the activities being carried out by the candidate during an assessment and have substantial experience in carrying out similar activities, and a requirement for the assessor to be competent in the examination being assessed. Accordingly WIA Assessors and Nominated Assessors will hold the Advanced or equivalent amateur licence (today the unrestricted, limited or intermediate licences)

There will be two levels of assessor; a WIA Assessor is someone who has been qualified by a Registered Training Organisation registered in accordance with the Australian Quality Training Framework, (an RTO), and accredited and registered by the WIA as a WIA Assessor.

It is the WIA Assessor who will assess the practical module and who can mark the written papers for all three levels of licence.

The other assessor, the Nominated Assessor, is someone qualified by an RTO and accredited and registered by the WIA as a Nominated Assessor. The Nominated Assessor's responsibilities include assisting WIA Assessors in carrying out assessments, auditing WIA Assessors and assessments, determining Recognition of Prior Learning assessments and undertaking Special Assessments, that is assessment of candidates suffering a disability, or remote assessments.

The Nominated Assessor has additional qualifications.

Recognition of Prior Learning is the recognition of current qualifications, and we have been very lucky as a number of people with relevant current qualifications have volunteered to assist. These people, when they can demonstrate a knowledge of the WIA amateur radio examination assessment system, will be qualified by the RTO and can then be accredited and registered by the WIA as either WIA Assessors or Nominated Assessors as recommended by the RTO without attending a further training course.

These steps will ensure that the system will acquire and retain the credibility it needs to encourage candidates to seek to qualify from the assessors and to become amateurs, after all that's what it's really all about.

The first training courses will be conducted in Adelaide on 27 and 28 August, Brisbane (Gold Coast) on 10 and 11 September, Melbourne on 17 and 18 September and Sydney on 24 and 25 September.

With those already almost qualified with existing current qualifications, and with those attending the training courses, I expect that we will have some dozen or so Nominated Assessors and some 60 or so WIA Assessors, covering the country from southern Tasmania to the Queensland tablelands, from Perth to Darwin to Alice Springs, and all the major cities.

An important reason for the move to a qualified assessor was the need to examine the practical module of the Foundation licence qualification.

The practical module will become an essential element of amateur qualification in Australia, ordinarily as a part of the Foundation certificate assessment. However if the candidate is attempting the Standard or Advanced certificate as a first qualification he/she will have to complete the practical module. Candidates will be exempt from the practical module if they held an amateur licence or amateur qualification prior to the Determinations coming into force.

A WIA Assessor will be required to undertake the practical assessment.

But the WIA Assessor will also be able to mark all written papers for Foundation, Standard and Advanced theory and Standard and Advanced Regulation, meeting the need to provide an immediate result for candidates who are judged competent and immediate guidance for candidates needing more work to become competent.

It is imperative that the methods we adopt ensure that what we do has credibility. That is, there can be no suspicion of improper practices, or different levels being allowed to develop in different places.

We are establishing a system of Foundation Packs to enable each relevant document to be tracked. We will continue to use the examination material requests for specific candidates that we presently use for the other examinations. Each WIA Assessor and his/her assessments will be audited annually, and each WIA Assessor will have to apply for re-registration every three years.

We believe that these steps will ensure that the system will acquire and retain the credibility it needs to encourage candidates to seek to qualify from the

continued on page 18

WIA News

WIA appoints a National Repeater Coordinator

With all licensing now centralised in Canberra and the ACMA requirement that all applications for a repeater are submitted with WIA endorsement, it has become necessary for the WIA Board to appoint one person to act as the liaison with the state Technical Advisory Committees and the ACMA office in Canberra.

The Board has appointed Peter Mill, VK3APO/VK3ZPP to this position. Peter has a wealth of experience in repeater operation and frequency allocation, starting in the late 60's with his attendance at the first National VHF band planning meeting held in Albury - Wodonga.

Peter's duties include;

- Consulting with the state Technical Advisory Committees on all matters relating to new repeater licence application and repeater band plans;
- Providing letters of endorsement for new repeater applications for the ACMA, as required and approved;
- Providing an information flow to and from the WIA Board on all matters relating to repeaters;
- Providing a report in respect of repeaters and repeater band plans as requested for each Open Forum or other meeting following each Annual General Meeting, and
- Undertaking such other coordinating tasks in relation to repeaters as are requested and agreed from time to time.

The appointment, except the first appointment, is annual, by the Board after each annual general meeting.

Peter can be contacted via email at pbmill@froggy.com.au

Three WIA stations operate in the RD contest

This year at least three WIA stations operated in the RD contest, VK2WIA, in the Hunter Valley in the heart of wine country, at the Luskintyre aviation museum, VK3WIA at the ScienceWorks museum in Spotswood and VK6WIA from the QTH of the hard working awards manager, Mal VK6LC.

WIA Board invites comment on Draft Postal Ballot for Director Regulations placed on website

Clause 14.1 (c) of the WIA Constitution says, in part that "The Board may determine that the election of Directors be conducted by postal ballot with the result of the election to be announced at the annual general meeting. A postal ballot shall be conducted in accordance with the regulations made by the Board from time to time."

The Board has decided that the election of Directors shall be conducted by postal ballot. If the election were confined to those in attendance at the AGM, the members from one geographic area would be favoured, and so a postal ballot is seen as the only fair way.

As the first election of directors will take place at the next AGM early next year, the Board has approved a draft of the regulations and placed it on the WIA website, www.wia.org.au, for members to read. If you have any suggestions or comments, send them to the WIA Secretary, either by mail to the national office or by email to secretary@wia.org.au by 20 September 2005.

Italy joins no-code ranks as FCC revives Morse debate in the US

The ARRL reports that Italy is to be the latest country to no longer require amateur radio applicants to pass a Morse code examination to gain HF access. The Daily DX reported this week that current IW-prefix "no-code" VHF/UHF licensees in Italy now will be allowed operate on HF and may also apply for new callsigns if they wish. Canada eliminated Morse code as the "sole additional requirement" for HF access in late July. To date, more than two dozen countries around the world - including such major players as the United Kingdom, Germany, Australia and New Zealand - no longer require amateur radio applicants to pass a Morse code examination to operate on frequencies below 30 MHz. If the FCC's past observations on the subject are any clue, the US could be joining the no-code-required club in the future.

WIA appoints National QSL Bureau Coordinator

The WIA undertook as part of the transition from a federal to a national structure to provide a QSL service at no charge to its members. The WIA Board has formulated a policy which continues to rely on existing individuals and groups, achieving economies of scale by concentrating outward QSLs through the Westlakes club.

The Board decided to appoint the existing VK6 QSL manager, Neil Penfold, VK6NE to fill this position. The Board felt a dedicated manager is required to manage and promote this aspect of the WIA's commitment to its members.

Neil's duties will include:

- Ensure all stakeholders are fully informed and understand the respective roles required to deliver the WIA's QSL commitment;
- Coordinate the activities of all in relation to outward QSL services;
- Ensure that the QSL service effectively meets the needs of members in a cost efficient way;
- Develop improvements to QSL service;
- Maintain an overview of the financial aspects of the service;
- Promote the WIA QSL service as a benefit of membership, and publicise

New From LDG Electronics DIS-4 Desktop Coaxial Switch

It can be tough switching between your 6-over-6 Yagi; your 4 element Quad, your 600' terminated Rhombic, and your full-size 160 meter vertical. I know I just hate it; crawling under the desk, wrangling stiff pigtails of RG-213 up to the rig. Even if you use a coax switch, most of them have the connectors splayed out at all angles, leaving the coax running all over the place, taking up half the desk. And then, you have to be able to reach the switch knob, so all that RG-213 is right there in your face.

So you get all that sorted out, you're at your local ham club meeting one evening when a killer lighting storms sweeps through, and you find yourself wondering if you remembered to set the switch to ground your antennas. If not,

A dual band CW transceiver

Part 2

Dale Hughes VK2DSH
PO Box 7430, Sutton, NSW 2620

The previous part of this article described the CPU and DDS module, along with the transmitter. The remaining sections of the transceiver are described in the following pages. Also provided are alignment details, technical references and component suppliers.

Receiver details – attenuator, preselection filter and amplifier

RF input from the antenna is applied to the preselector board (figure 6) which consists of a switchable attenuator, two selectable band-pass filters and an amplifier. Band-pass filters are selected according to the receive frequency and keep strong out-of-band signals and noise from the amplifier and mixer. The attenuator has four settings: 0, 6, 12 and 18 db and the CPU is programmed to default to the 6 db setting. Otherwise they are set according to need by the operator. The RF amplifier is a common design which uses transformer feedback to provide input and output impedances that are close to 50 ohms over a wide range of frequencies. Other suitable transistors types are 2N3866 or 2N4427, if the specified transistor is not available.

The schematic of the preselector board is shown in Fig 6. T1 is 15 bifilar turns on an Amidon T50-J or T50-43 toroidal core. Winding details for the band-pass filter inductors (L1, L2, L3 and L4) are given in table 2.

Component	160 m Band	80 m Band
L1 & L2	8.2 µH, 24 turns, T50-15 core, 0.4 mm wire	
C1 & C7	220 pF	
C2 & C5	560 pF	
C3 & C6	5 – 65 pF	
C4	33 pF	
L3 & L4		8.2 µH, 24 turns, T50-15 core, 0.4 mm wire
C8 & C14		82 pF
C9 & C12		120 pF
C10 & C13		5 – 65 pF
C11		8.2 pF

Table 2: Band-pass filter component values. Capacitors should be either polystyrene, silver-mica or polyester types. Ceramic capacitors are not suitable

The band-pass filters can be changed to suit other bands if required, table 2 shows the component values for the existing version which operates on 160 and 80 m.

Receiver details – quadrature mixer

Signals from the preselector filter and amplifier are passed to a pair of mixers through a conventional 3 db coupler made up of T1 and a 100 ohm balancing resistor. As the receiver uses a phasing method to reject an unwanted sideband (or image frequency) a pair of local oscillator signals in phase quadrature is required. A 74HC74 dual flip-flop is configured to generate the quadrature signals, and these are fed to the mixer switches in anti-phase. Figure 8 shows the timing relationship between the RF input and the RF output in quadrature phase at half the input frequency. Note components R19 and C22, they form a time delay circuit (approximately 10 ns) which compensates for the propagation delay of signals through U6c. Without compensation, the accuracy of the 90 degree phase relationship at the output of the 74HC74 dividers is degraded, which results in reduced image suppression at the receiver output. For example, without the delay compensation the image rejection was measured to be 20 db, when the compensation was included the image rejection was measured to be 47 db.

The schematic of the mixer board is shown in Fig 7. T1 is 18 bifilar turns on an Amidon T50-J or T50-43 core, T2 and T3 are 12 '5filar' turns wound on Amidon T50-J or T50-43 cores. '5filar' is five wires twisted together before winding on the core. Wire size is 0.24 mm for T1, T2 and T3, using different coloured enamel wires for each winding helps winding identification.

The carrier quadrature phase generator timing diagram is shown in Fig 8.The dashed lines are the signal without the delay compensation (R19 & C22) and show how the 90 degree phase relationship is degraded by allowing the output of U5 to toggle early.

The mixers are a variation of the 'H-mode' design which is reputed to produce a mixer with very good signal handling ability. This variation eliminates the need for multiple transformers which are required in the conventional version; this design requires a transformer with five windings on a small toroidal core. The advantage of the 'H-mode' design is that one side of the mixer switches is connected to ground and this eliminates the variation in gate 'on and off' resistance due to the local oscillator drive that can degrade the strong signal capability of switching type mixers. Hawker[1] gives a good discussion of these mixers and their attributes. The amplifiers at the mixer output (U2 and U4) provide significant gain at audio frequencies, the audio output then passes through a low-pass filter to remove noise and unwanted frequencies before the signals are passed to the phasing network.

All resistors in the signal path are 1% tolerance devices and capacitors C11 and C12 are matched to 1%. The use of accurately matched components helps to ensure that the gain and phase relationship of both mixer outputs is matched and that the rejection of the unwanted sideband (audio image in this case) is maximised. A rule of thumb states that 40 db of image rejection requires that there be no more than 0.1 db amplitude difference and 1 degree of phase difference between the I and Q signal paths.

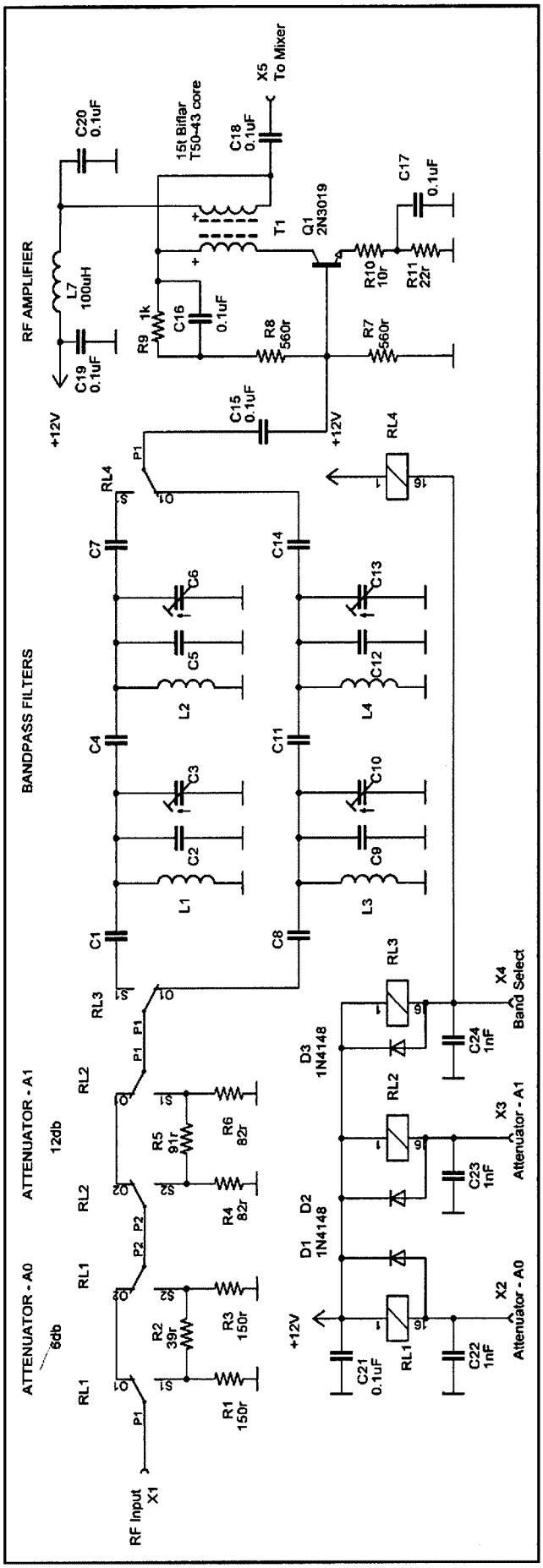


Figure 6: Schematic diagram of the preselector board.

Receiver details – phasing network and filter

The two audio signals in phase quadrature (I & Q signals paths) from the mixer board are passed through an all-pass filter which maintains an accurate 90 degree phase difference between the two channels over the range of speech frequencies. The output from each mixer channel is phase shifted and then added together, and as a result of the quadrature phase relationship between the audio paths and the local oscillator, the audio image (the unwanted sideband) is cancelled out. Small amplitude differences between the I and Q channels can be corrected by means of potentiometer VR1 at the summing junction.

This design is taken from Hayward, Campbell & Larkin[2] which gives a very good description of how phasing networks function. The phasing network resistors are standard 1% tolerance and the required values were made up from series connected resistors. The capacitors were hand selected from a bulk purchase of 100 polyester capacitors and were chosen from the batch so that all the capacitors used had matching values. The NE5532 dual amplifiers have a wide bandwidth and low noise, making them ideal for this application.

As is common with standard direct conversion receivers, all selectivity is obtained at audio frequencies, so a band-pass filter is placed between the phase network output and the audio output. The network shown has upper and lower cut-off frequencies of 2.7 kHz and 300 Hz respectively. Hayward et al[2] gives designs for additional narrow band CW filters.

Receiver details – audio output and side tone oscillator

This small board performs two functions:

- In receive mode, the receiver output passes to an audio amplifier which drives headphones or a small loud speaker.
- During transmit, the receiver audio is disconnected and a 'twin T' oscillator generates a tone when the transmitter is keyed.

Oscillator transistor Q1 is switched by Q2, and the frequency of operation is set by R2, R3, R4, C1, C2 and C3. With the values shown, the side tone is approximately 700 Hz. The output level of the side tone can be set by adjusting the level potentiometer (VR1) on the circuit board. The output amplifier is one half of a dual power amplifier and the maximum audio output is approximately 1 watt.

The schematic of the audio amplifier and side tone generator is shown in Fig 10. Note that the PTT signal from the Morse key routes through this board to the opto-isolator (Fig 4) board and CPU board (Fig 3). This simplified wiring in the prototype unit.

General construction

As the intention was for the transceiver to be a portable, battery powered device, most of the circuitry is installed inside a diecast box 222 mm long, 146 mm wide and 55 mm deep (Jaycar # HB-5050). It's a bit of a squeeze to fit everything in, so the transmitter and receiver modules are

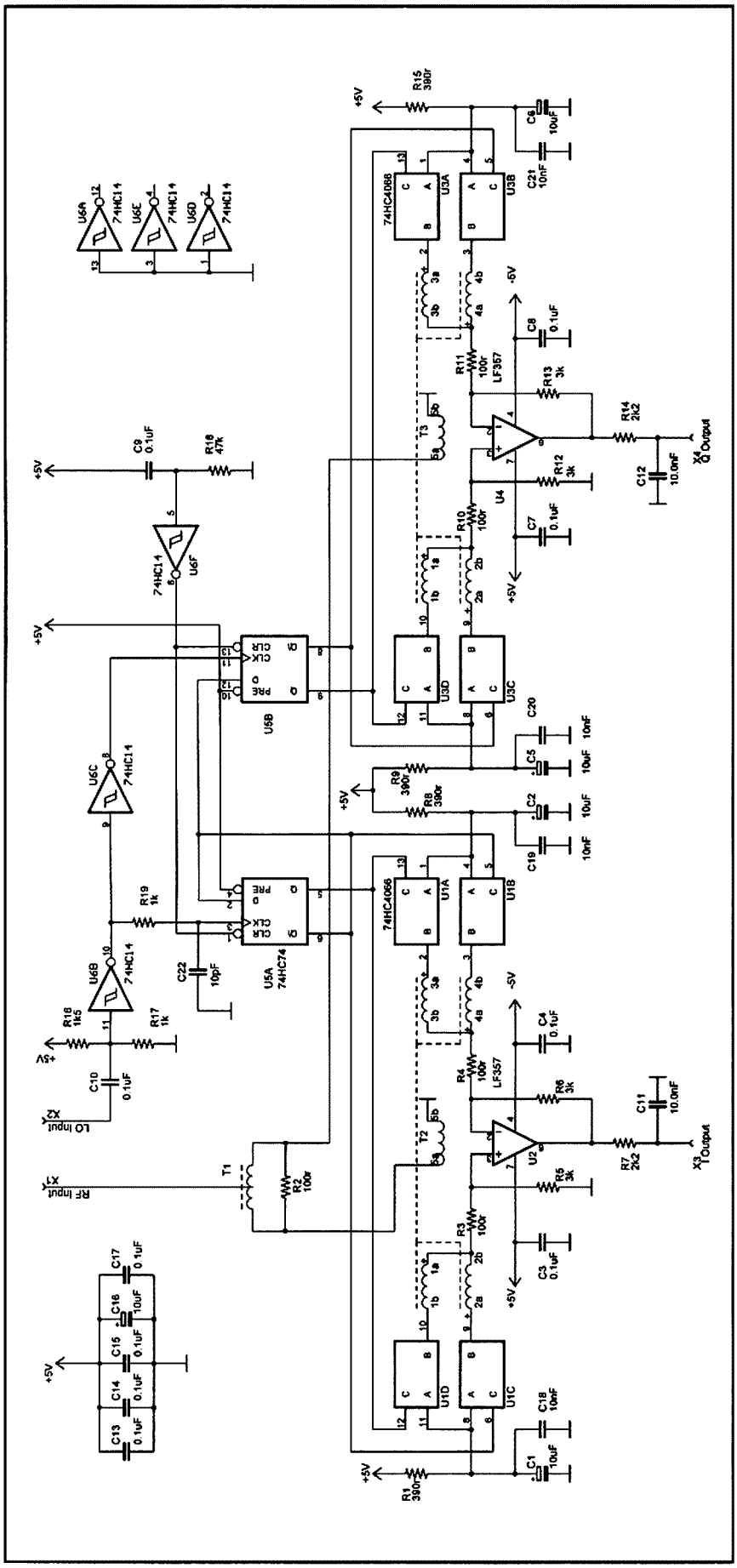


Figure 7: Schematic diagram of the mixer board.

mounted on the bottom of the box and the CPU, opto-coupler, keyboard, LCD and audio board are mounted on the lid of the box, see figure 11 for details. The CPU, keyboard and display are separately screened using double-sided printed circuit board laminate. Signals into, and out of, the CPU module are passed via feed-through capacitors.

Covering the transmitter and receiver modules is a separate screen and all signals into and out of these modules are via feed-through capacitors. Extensive filtering and screening significantly reduce the potential spurious signals generated by the high speed digital components (CPU etc). The DC-DC converters which generate the positive and negative 5 volts supplies are fitted inside another small diecast box which connects to the transceiver using screened cable.

See Fig 11 for an internal view of the transceiver showing the placement of the various modules. On the bottom of the box the transmitter module is on the left-hand side, the preselector module is in the middle, the audio phase shift network is top right and the mixer is bottom right. A screen usually covers the modules in the bottom of the box. The lid holds the side-tone and amplifier module, the opto-interface and the CPU-DDS module (beneath the PCB screen).

Adjustments and conclusion

An advantage of this design is that there are very few adjustments before the receiver is usable, and none for the transmitter. The preselector band pass filters need to be tuned to the required frequency and this is achieved by adjusting the trimmer capacitors in the filters. So that image rejection is optimised, it is important that the phase difference between the receiver mixers is as close to 90 degrees as possible. As the quadrature generator is a digital device no adjustment should be necessary, however the delay compensation network can be trimmed if required. Amplitude balance can be trimmed by adjusting VR1 on the phasing board to minimise reception of the unwanted sideband. Tune to a strong signal and then tune through zero beat; if the amplitude balance or phase shift is inaccurate a signal will be heard. Stay tuned to the unwanted sideband and adjust the local oscillator phase and

TTS Systems Communications Equipment

TTS Systems

www.ttssystems.com.au

FREE CATALOGUE

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

New From LDG Electronics — DTS-4 Desktop Coaxial Switch

It can be tough switching between your 6-over-6 Yagi; your 4 element Quad, your 600' terminated Rhombic, and your full-size 160 meter vertical. Crawling under the desk, wrangling stiff pigtails of RG-213 up to the rig. Even with a coax switch, most have the connectors at all angles, leaving the coax running all over the place, taking up half the desk. And then, you have to be able to reach the switch knob, so all that RG-213 is right there in your face.

So you get all that sorted, you're out when a killer lighting storms occurs, "Did I set the switch to Ground?" If not, will you have a smoking heap of rubble where your rig was.

Help is at hand. The LDG DTS-4 Desktop Coaxial Switch is made for hams, by hams, to solve these very problems. With the DTS-4 you can instantly switch your rig between 4 antennas with the press of a button. All five coax sockets (4 inputs and one output to your rig) are lined up across the back of the switch, so all the coax can run straight back. This means the DTS-4 will fit in just about anywhere on your desk. A bright red LED indicates the antenna in use. At a touch of the control buttons, all inputs are grounded, helping to protect your radio from Mother Nature.

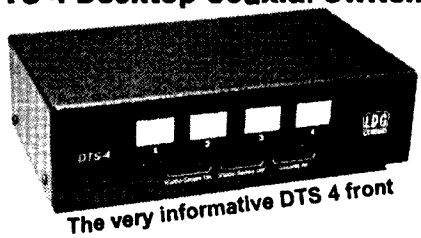
Remember that lightning? The DTS-4 can sense when your rig is turned off, and automatically ground all antenna inputs! You simply run a line from a DC-out port on your rig (most modern rigs have at least one) to the DTS-4 and set it to Radio Sense mode with a simple button-press. From then on you're protected; . Power up and the DTS-4 automatically resets to the last used antenna. Use your radio's auto power off feature and it will even protect you if you forget!

But that's just the beginning! How about remote-mounting the DTS-4, say on the floor under the desk, or even in the basement to keep all that pesky coax at bay, and using a compact remote control box on your operating desk?

The DTS-4R remote control fills the bill, with a full set of control buttons and indicator lights, but only a single, slim control cable running to the remote DTS-4 switch.

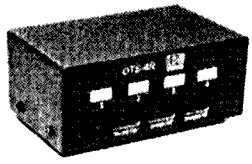
The DTS-4 handles up to 1500 watts of RF power on HF (1000W on 6M), and can be used with any coax-fed antenna. The Radio Sense feature needs at least 2 volts from your rig, at 1 mA current. The DTS-4 features Teflon SO-239 connectors, and requires an external 12 VDC power supply at 250 mA. If the external power supply fails, all inputs are grounded, so it's fail-safe. Switching is done by rugged, sealed industrial relays.

Add the DTS-4 and DTS-4R to your shack soon; it's the modern coax switch you've been waiting for.



The very informative DTS 4 front

The highly organised back



The space saving desktop remote

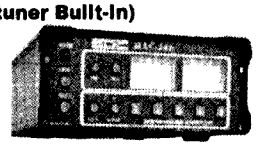
A six position version will be available in the near future.

MAC-200

MASTER ANTENNA CONTROLLER

(Smartuner Built-In)

Control up to 5 Antennas



Select the right antenna, for the right band, at the right time with the MAC-200. The Master Antenna Controller operates as your base station control center, eliminating complicated switching and tuning. With the MAC-200, you can select between up to five antennas and tune automatically to minimum SWR. You can monitor your power and SWR with two convenient meters on the front panel of the unit. The MAC-200 puts you in control of your antennas.

Full info available—ask

SG-237 Smartuner™

High density surface mount components in a 4 layer PCB on a chassis plate: all providing high efficiency, reliability, performance with excellent electrical and RF ground system. Fully waterproof (.6metre/24 submerged). Case is weather resistant, factory-sealed ABS plastic.

MULTIPLE APPLICATIONS -- Use for base, mobile, portable, marine or aviation. Rugged construction and small size allow maximum flexibility. 100W power rating and frequency coverage to 60MHz, matches most popular HF transceivers. Works with balanced or unbalanced antenna: whips, backstays, dipoles, loops and longwires, and requires only 28 feet of antenna for full coverage operation.

Full info available—ask

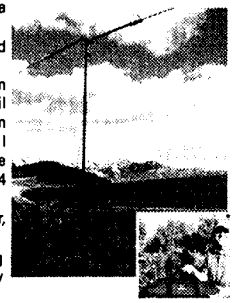
BUDDIPOLE

It's a dipole... It's a vertical... It fits in your travel bag! Optimised for transmit power, proven for DX work.

Ultra light composite materials and High-Q coils. Zero-loss balun with Quick-Connect feedpoint.

Standard Buddipole antenna comes with—

- Two 22" black anodised aluminium arms • Two multi-band coils (40m - 10m) with adjustable coil tap pre-marked system • Two stainless steel telescopic whips, the VersaTee™ with 3/8" x 24 adaptors
- BNC/PL259 coax connector, 25' of RG58 coax
- "Packcloth" carry bag thermo-plastic carry case; ops manual.



Order your 450 ohm Ladder Line NOW

ADSP SPEAKER

Three modes:

- •no noise reduction;
- •original ADSP;
- • new ADSP2 noise reduction –up to 26 dB of noise reduction within the passband.

Z100 TUNER AND Z1000 HIGH POWER AUTO TUNER

We have

SGC 237 Waterproof Auto Tuners

SGC 239 Economy Auto Tuners

Autek Antenna Analysers

Autek RF 2kW In-line Power meters

Lutron

Lutron Measuring Instruments

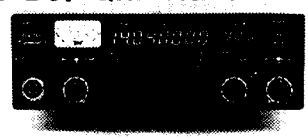
Vantage Pro Weather Stations

TEN-TEC KITS

Ten-Tec 3003 Acro-Bat antenna hanger.

UV resistant polycarbonate plastic, S/S hardware.. Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna. or ladder line with internal pegs.

Model 516 Argonaut V IF-DSP QRP Transceiver



IF-DSP in a modern 20 watt HF trans-ceiver. 20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjustable from 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP). Metering measures forward or reflected power in switchable 2 or 20 watt scales.

phasing network amplitude balance until the signal can no longer be heard. The phase relationship of the mixer local oscillator can be checked by looking at the I and Q outputs of the mixer with an oscilloscope. The oscilloscope should be set to the X-Y mode and the inputs to the oscilloscope should be connected to the I and Q mixer outputs. Tune the receiver to a strong signal and observe the output from the mixers, a circle, or ellipse should be seen on the oscilloscope screen. Figure 12 shows what might be seen, the left hand trace shows the result when the phase relationship between the mixer local oscillators is not ninety degrees. The right hand trace shows the result – a perfect circle – when the local oscillator inputs are in phase quadrature. The phase angle can be calculated using:

$$\sin\theta = \frac{Y\,int}{Y\,max}$$

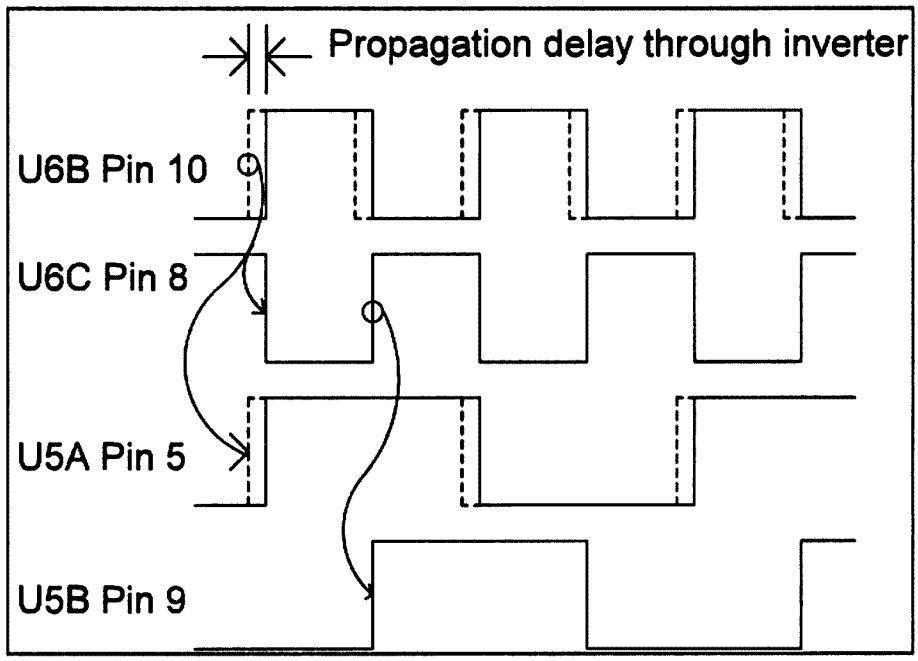


Figure 8: Carrier quadrature phase generator timing diagram.

Where the Yint equals the point where the ellipse crosses (intercepts) the vertical axis and the Ymax equals the highest (maximum) vertical point of the ellipse, theta (6) is the phase angle between the mixer outputs, and it should be very close to ninety degrees for best sideband rejection. See Orr[3] for more details about phase measurements using this technique.

Lissajou figures obtained by connecting the I & Q channels to the horizontal and vertical inputs of an oscilloscope are shown in Fig 12.The maximum and intercept values can be easily measured

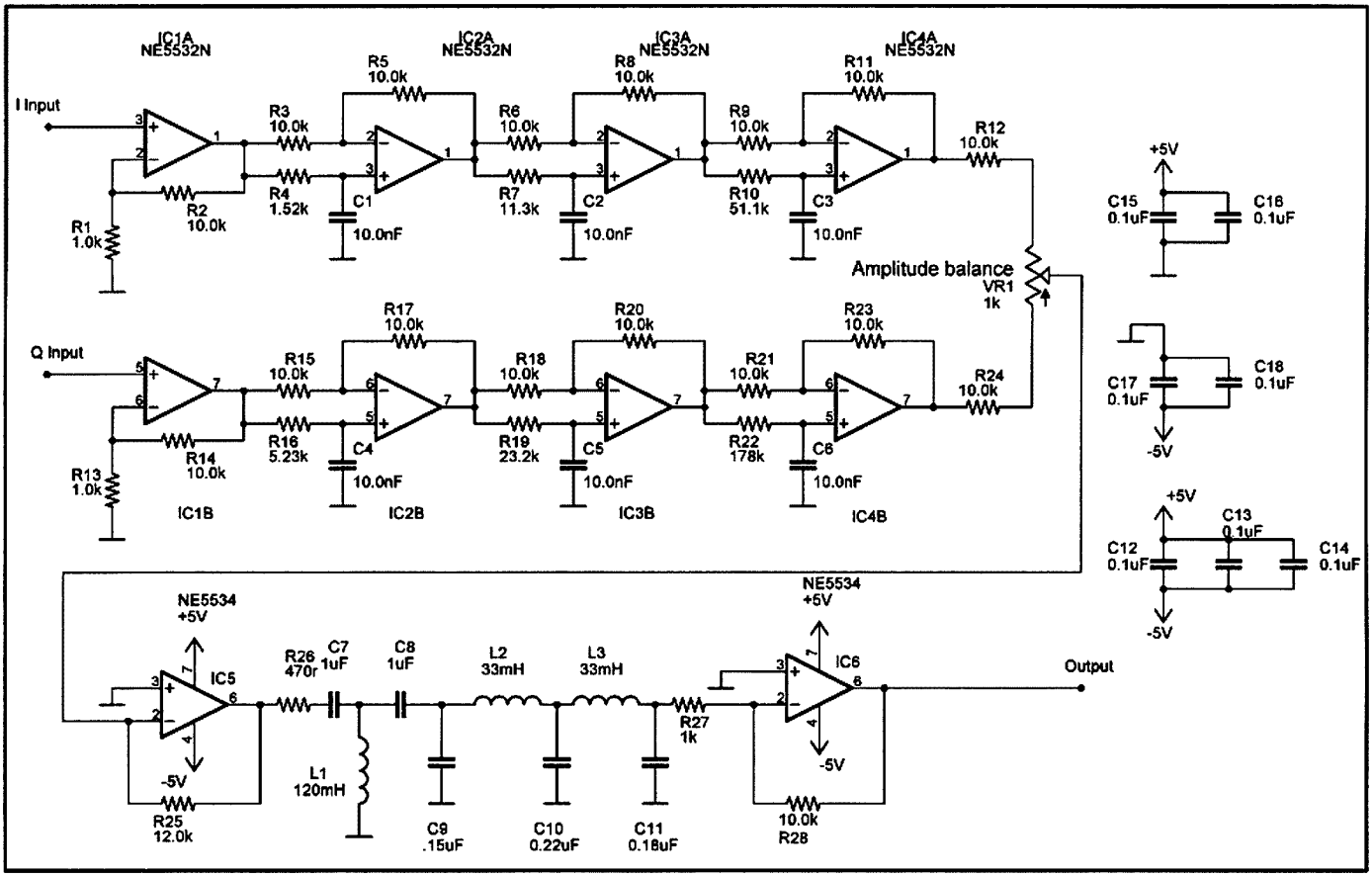


Figure 9: Schematic diagram of the phasing and filter board.

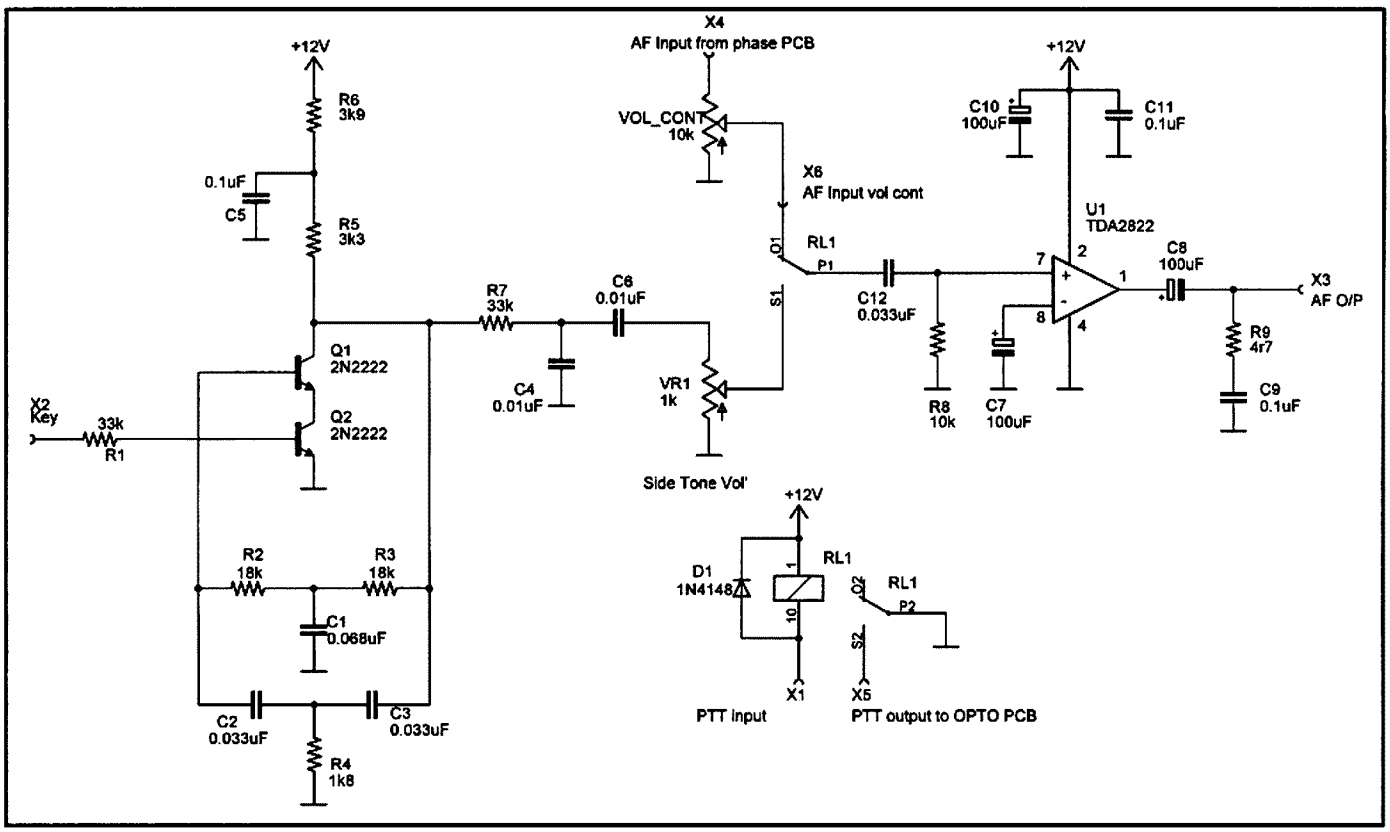


Figure 10: The audio amplifier and side tone generator schematic.

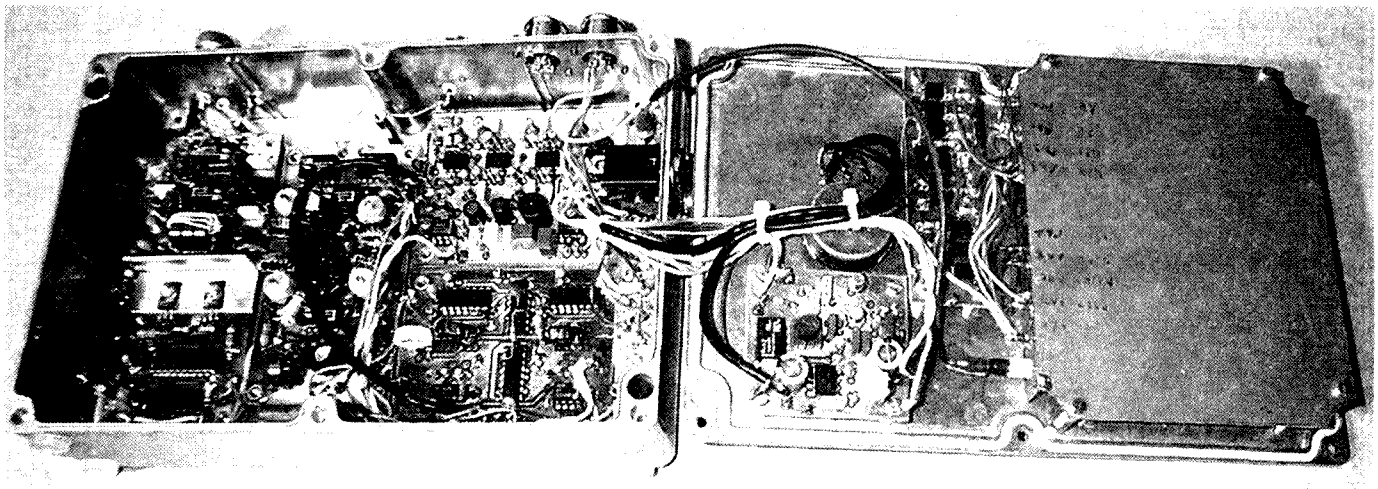


Figure 11: An internal view of the transceiver showing the placement of the various modules.

from the oscilloscope graticule.

Similarly, the performance of the audio phase shift network can be checked by connecting the I and Q inputs together and feeding an audio signal in, while observing the outputs of IC4 (pins 1 & 7). A circle should be seen on the oscilloscope if the network is working correctly. If an accurate circle is not seen, it indicates that the components in the phase shift network are not closely matched and they should be checked and replaced.

The receiver is a joy to use and it is very sensitive. It has low noise and the audio quality is superb. It appears to have an excellent capacity to handle strong signals and shows no tendency to overload even without any form of automatic gain control. Image rejection is excellent, this is easily tested by tuning a signal through 'zero beat' and hearing it disappear into the noise. Due to the excellent frequency stability and resolution provided by the DDS, it is possible to receive AM signals without the annoying beat note.

Transmit quality is good and no problems have been noted during use. Due to the use of DDS technology, frequency stability is as good as a crystal, with the added advantage of being able to accurately set receive and transmit frequencies. One of the idiosyncrasies of direct conversion receivers is that the receiver local oscillator frequency needs to be offset from the incoming signal; otherwise no beat note can be heard. In this design, the user has the option of setting a positive or negative receive offset that is added to the frequency displayed on the LCD. Thus, if the unit is set to 3500 kHz, and the offset is positive 500 Hz, the receiver local oscillator is set to 3500.5 kHz and a 500 Hz tone will be heard when a signal is present on 3500 kHz. There are no restrictions on the receiver offset frequency so it is possible to transmit on 3500 kHz and receive on 1850 kHz by setting the receive offset to negative 1649.5 kHz. When a signal is present on 1850 kHz, a 500 Hz tone will be heard in the receiver. Thus, split frequency operation is possible by setting the offset frequency to the desired value.

I'm happy to provide the software for the Atmel controller to interested readers, please write to the above address. None of the components used in the design should be difficult to obtain. The Amidon toroidal cores were purchased from RJ & US Imports[4], and the DDS chip and 30 MHz oscillator were purchased from Mini-Kits[5]. The rest of the components were obtained from Jaycar, Farnell and DSE.

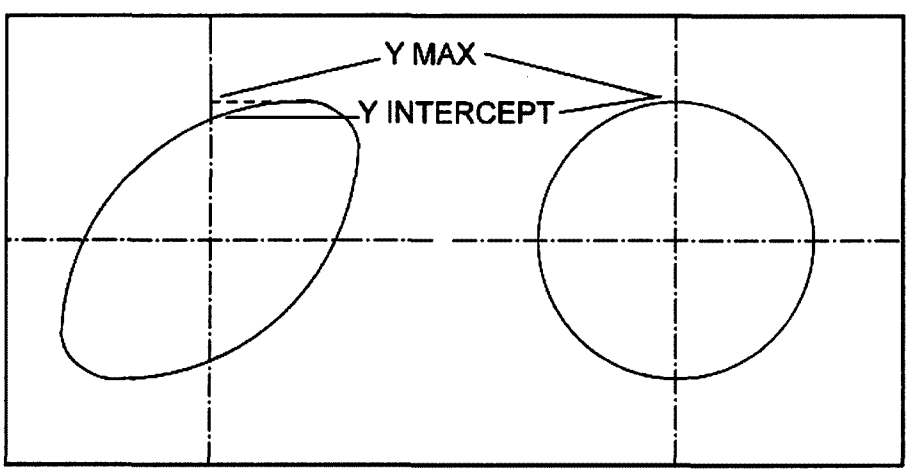


Figure 12: Lissajou figures obtained by connecting the I & Q channels to the horizontal and vertical inputs of an oscilloscope.

References and suppliers

1. Hawker, P, Technical Topics Scrapbook 1990 to 1994. RSGB, 1998. P230
2. Hayward, Campbell and Larkin, Experimental Methods in RF design, ARRL, 2003. In particular, Ch 9, which deals with the theory and design of phasing systems for image rejection systems.
3. Orr, W, Radio Handbook, 21st edition, Editors and Engineers. 1978
4. RJ & US Imports, PO Box 431, Kiama, NSW, 2533
5. Mini-Kits, PO Box 368 Enfield Plaza, SA, 5085

ar

Remembrance Day

A broadcast message

from

His Excellency Major General Michael Jeffery, AC CVO MC (Retd)

Governor-General of the Commonwealth of Australia

to

The Wireless Institute of Australia

Greetings to all the radio operators of Australia, wherever you may be, within, or beyond the shores of our great nation. We are tuned in today to celebrate the 60th Anniversary of the end of the War in the Pacific.

It is a privilege to be invited to declare open the annual Remembrance Day Contest, which honours service men and women who gave their lives in the defence of freedom.

Australia has always been able to rely upon the service given so freely by its amateur radio operators. Even in the darkest days of World War Two, radio operators who had enlisted in our armed forces, helped relay vital news from battle fronts to their commanders, greatly assisting strategic co-ordination.

Australian radio operators gained a reputation rivalling the very best. Men and women, whether they were telegraphists or coast-watchers, provided links which could quite literally be described as life-lines. Coast-watchers, occasionally in full view of the enemy and at great personal risk, reported invaluable detail of enemy activity. At times they were so close their transmissions were quickly detected.

The same skill and perseverance requirements apply today. Effective communication in every defence area is vital, whether via a crisp satellite link or a crackling high frequency radio.

And surely those coast-watchers of yester-year would marvel at today's modern technology, including satellite, digital, burst transmission and automatic encryption and decryption capabilities.

This year marks the 60th anniversary since the end of the war in Europe and the Pacific. You are about to hear a roll call of the Australian radio amateurs who gave their lives in the defence of this country. To those individuals who put duty to their country first, we owe our deepest thanks.

It is now with considerable pleasure that I declare the Remembrance Day Contest for 2005 open. Good luck to you all, and good DX.

RD reminiscing

Joy Stevens

"It is my sad duty to inform you that Australia is at war with Germany....."

September, 1939. My father was in his chair beside the open fire; my Mother on the other side; my immediately older sister sitting with her boy friend, and I on the floor leaning against my Mother's chair. My parents' reaction was very solemn; but for me, having just turned 16, it was: 'Oh well, it's on the other side of the world. We'll be OK.'

And so for a few months it was. Then suddenly one of our cousins joined up and went away with the 6th Divvey. Gradually various tradesmen came knocking on the back door to say goodbye to Mother. My second eldest sister's husband, who was in peacetime militia, was called up and went into camp, so all of a sudden it was not OK.

In September 1940 I obtained a position with the Department of the Army and was based with the Australian Army Canteens Service, Queen Street, Melbourne. The Women's Services had not been instigated at this stage.

As the War increased in intensity, so did the action in Queen Street. AACS serviced canteens any where Australian troops were camped – here and overseas. It was not unusual to work overtime a couple of nights a week and one night I went with two other staff members for a tea break (we were given 2/6 pence tea money). The waitress who served us was in floods of tears and when we asked what the trouble was, she pulled a very crumpled telegram from her apron pocket and gave it to us to read. Her husband had been "killed in action". We said why don't you go home and she just said through her tears: "What for?"

By January 1943 I decided to join the AWAS, did my rookies school, came back to Queen Street, received my first stripe one day, next week two stripes and was made Sergeant in March, 1944. January, 1945, I volunteered to go to Lae, New Guinea. General Blamey had agreed to allow a small contingent of 344 AWAS and I was accepted due to my extensive time with AACS.

We did an extensive training programme in Queensland before embarking on the 'Duntroon' on 2nd May, 1945. I had never set foot on any kind of a boat before and although there was a mine sweeper ahead and we had an escort convoy, I felt sure the ship was going to sink!

Up to this time the Allies were winning the war in Europe and as it happened, VE Day, 3rd May, 1945, we were on board the 'Duntroon'.

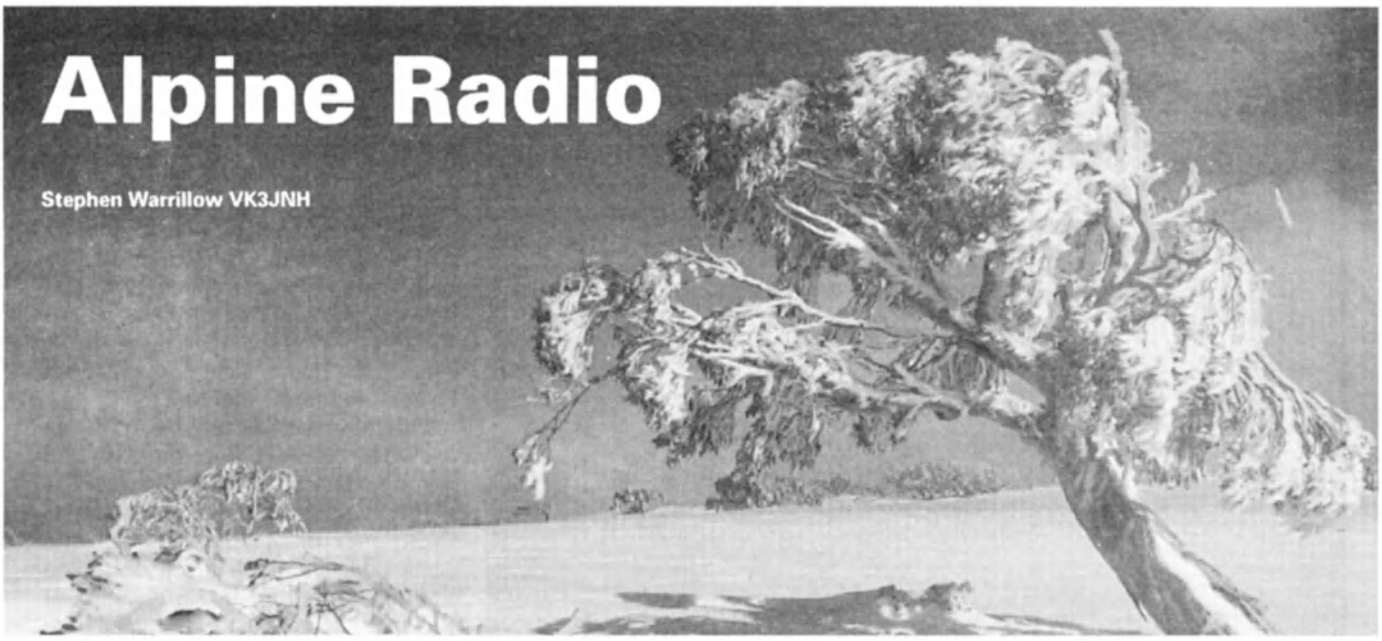
What a different world I was about to enter! Swaying coconut palms – all shot to ribbons. Hundreds of thousands of American and Australian troops; guns; armoured guards; atabrine (or atabran), an anti-malaria drug; rules and regulations; work and play. My life in New Guinea was exciting: the absolute magnificence of the jungle; humidity and exploration of the countryside with groups and armed guards.

One thing which stands out is the New Guinea people, for those whom I came in contact with were very gentle people. I loved them!

continued on page 20

Alpine Radio

Stephen Warrillow VK3JNH

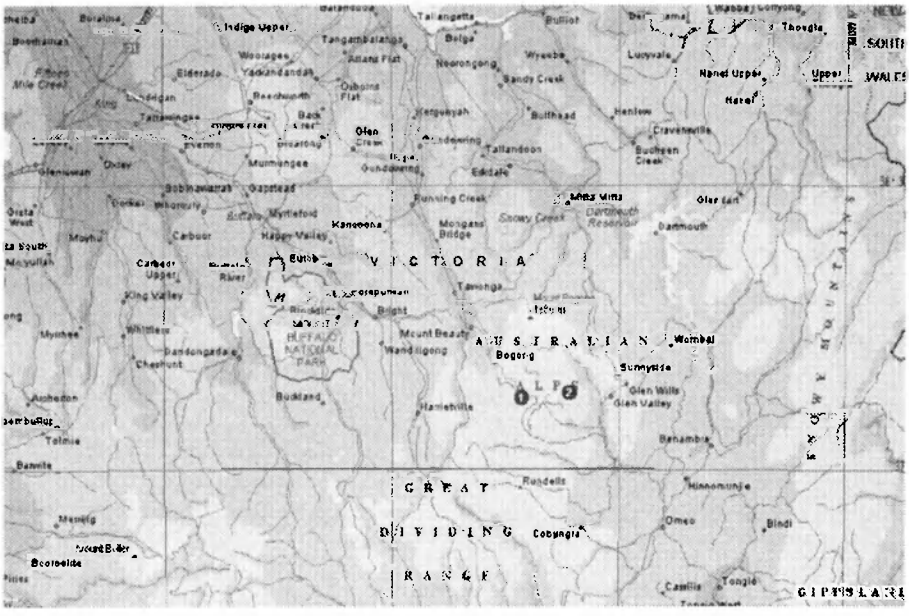


The Bogong High Plains region in the Victorian High Country is a picturesque place no matter what time of year. Every winter, this place is transformed by a blanket of deep snow and it is truly beautiful. During this cold season, Victoria's alpine resorts are packed with downhill skiers who come to enjoy the swift descent down groomed mountainside runs. Many are probably not aware of those heading off 'back country', away from even the groomed cross-country trails close to the resorts, to where one can enjoy the unique experience of skiing on virgin powder snow down unmarked slopes and gullies.

Cross-country skiing off the trails requires preparation, basic fitness and a sense of adventure. We have enjoyed exploring the Bogong High Plains for many years now with annual trips in summer and winter whenever we are able. Amateur radio has, on each occasion, brought an added dimension to these adventures. From providing essential means of communication between party members on the trip and family at home, to acting as a back up means of emergency communication in this isolated region, portable and hand-held gear has played an important role on each trip. Extended back-country cross-country skiing trips necessitate each member of the party to be self-reliant. All food, clothing and equipment must be carried in a rucksack while skiing through what can be fairly rugged terrain. Therefore only the essentials can be carried and all equipment must be light and robust.

As with previous years, we chose to head to the high plains in late July 2004 in order to maximise the chances of good snow conditions. Consistent with recent years, we were fortunate enough to have excellent snow with a good base of over 150 centimetres measured at Falls Creek. Knowing what not to pack is just as important as knowing what is essential to take on these trips. Keeping the previous year's list is an important short cut that helps decide how to prioritise what should go into the rucksack. Vital equipment includes rucksack, sleeping bag, first aid kit, snow clothing, sunglasses, skis, stocks and boots. Navigational aids such as detailed maps, GPS and compass are also necessary and we carried an

The trip in



Falls Creek

emergency satellite beacon with the group in the event of real trouble.

Catering for an extended trip is always a challenge; it is important that the menu be light, non-perishable, high in energy and palatable. Sufficient supplies were carried so that no one would starve if an unplanned additional day or two was spent out due to unfavourable weather.

During the warmer summer months, tent based camping in the alpine regions of Australia is very pleasant, but come wintertime, only the very well prepared and hardy take on extended periods of snow camping. In winter, we favour staying in alpine huts, many of which were built in the time that mountain cattlemen used to drive their stock up to graze on the summer grass each year.

While such huts are often very basic in construction, many have tremendous historical significance and are a very welcome warm shelter during the snow season. Unfortunately, several huts have been destroyed by bushfire over the last few years and it is important to check with locals that the specific hut one intends to stay in still stands prior to heading off.

Having selected a time to go and packed food, clothing and ski gear the next priority was what amateur radio equipment could be taken. Remember that every item on the trip had to be carried in a rucksack while skiing up hill and down dale.

With three licensed amateurs in the group, it was possible to assemble a fair amount of compact and reliable gear. We had always taken VHF/UHF FM handhelds and a variety of antennas in the past and enjoyed working through various distant repeaters accessible thanks to the remarkable line of sight paths that can be achieved from mountain tops.

This, however, was the year to attempt some HF DX work from the Alps and we were determined to find a way. The ability of manufacturers to miniaturise radio gear in recent years is quite remarkable and there now exist several multiband, multimode QRP commercial rigs that are small and light enough to carry cross-country.

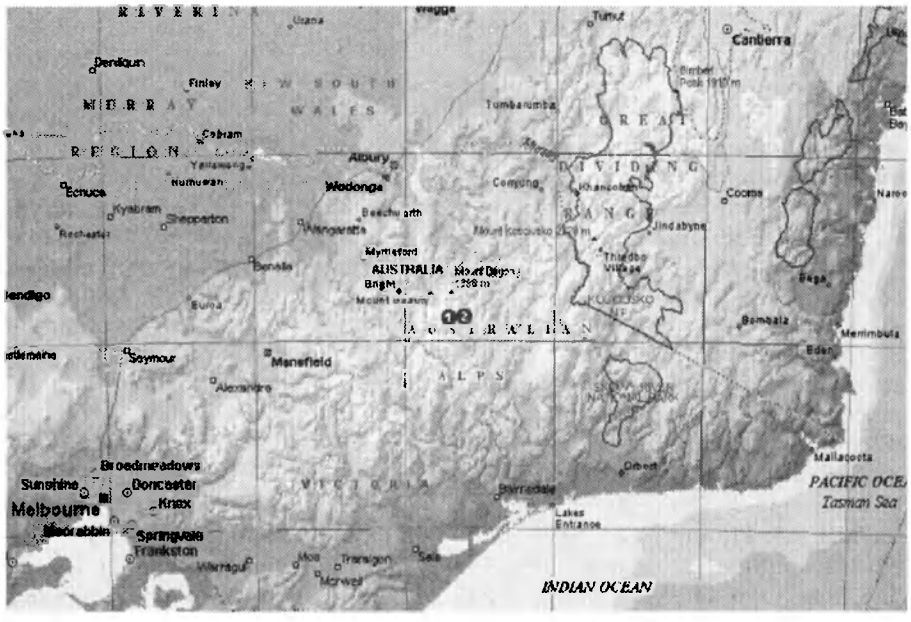
Powering such devices however, still presents a significant challenge. After some deliberation, it was decided to take a Yaesu FT-817 with an LDG Z11 auto tuner, which would work into a home brew multiband dipole with a QRP specific 4:1 balun. Power for this rig would be derived from 12 V sealed lead acid batteries (4.2 and 2.0 Ah) which could be trickle charged from an 'ICP BatteryFlex' 10 watt solar panel.

For communications between members of the group while out skiing and to work repeaters from hilltops, several VX-7Rs were also taken as was a variety of multiband whip antennas. The waterproof and rugged design of these little hand-held radios are very desirable characteristics when in the snow.

The total weight of the combined HF radio equipment and power system was approximately 4 kg, which fitted in well with the twenty-something kilograms of each rucksack when fully packed.

Due to work commitments not all members of the group were able to head to the hills on the same day. Most headed up to Fall's Creek on the weekend and then had a difficult ski in to the hut due to challenging weather conditions.

The remainder of the party joined up with the main group on Monday and managed to meet up on the trail in to the hut using two metres to coordinate a meeting place and check progress. Snow and weather conditions had substantially improved by this stage and the forecast was favourable for the next day or so.



Mt. Nelse 1884 metre Locality Map

Upon arriving at the hut all the most important preparations had been undertaken; a warm fire was burning, the kettle was on, the dipole had been strung between a couple of nearby snow gums with the solar panels sitting on a bank of snow, angled to catch maximal sunlight.

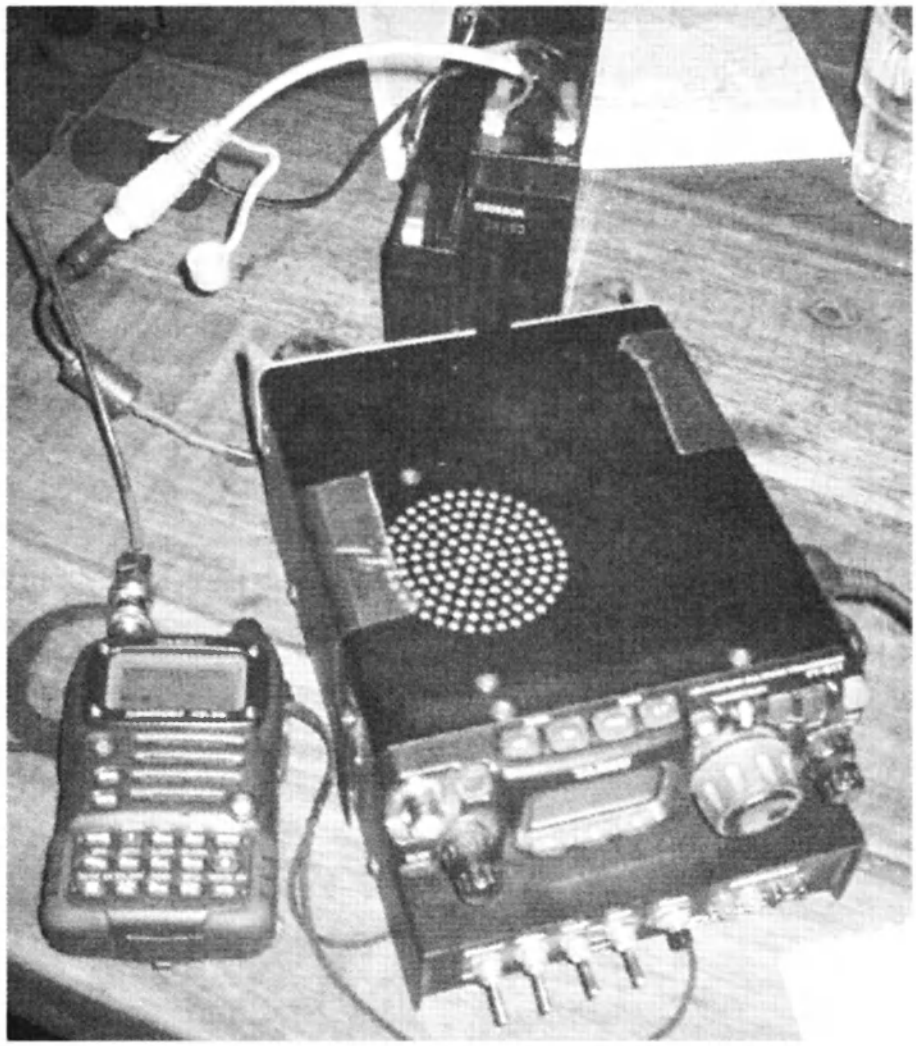
The following day was fantastic in every respect. There had been a light snowfall overnight and the day proved to be clear and bright, the main hazard being sunburn! After a quick hot breakfast, we set out on a tour of some of the more distant huts. With the combination of map, compass and GPS we were able to detour from the marked tracks and discover some beautiful snow gum forests, a delightful waterfall cascading down a steep gully and a broad sweeping snow plain, which fell into a small ravine.

The skiing was varied, some sections having steep climbs and descents, but for the most part it consisted of gentle inclines through snow gum forest or across snow meadows. One of the greatest joys of this type of skiing is the isolation and absolute silence. Apart from the swishing sound of the skis on fresh powder snow, the silence would remain unbroken.

Upon arriving at familiar huts, it is always interesting to see their condition and to thumb through the log to see how many visitors they have had over the previous season. Most visitors take the code of caring for these fragile structures and surrounding environment seriously and we were pleased to see the huts we visited were in good condition.

By late afternoon it was time to head back to camp and see if we could work some HF.

The solar panels had been carefully arranged to ensure maximal sun exposure through the glorious sunny day. Although the antenna was not particularly high, the complete absence of QRM meant that even weak HF signals could be readily heard. Several good contacts were made, mainly on 40 metres, including several members of the North East Radio Group in Melbourne. Throughout the afternoon, we enjoyed tuning across the HF bands and working QRP. Forty metres was certainly the most rewarding band with numerous contacts including a few US stations. Those non-amateurs in the group were certainly intrigued and amused by our exploits as well as being impressed that such low power gear and a piece of wire strung between two snow gums could work across such vast distances. Of particular interest to them was the use of abbreviations and Q codes, several of which they become very familiar with over the course of the trip.



The rig

We would like to thank those courteous and patient operators who took the time to work us and hear a little about our solar powered portable station in the snow. If there were any complaints, it would be the tendency by a small number of operators to acknowledge the presence of a portable QRP station, but then make no apparent effort to make space in a group to work us.

Changes in weather can be rapid in the high country and by late afternoon, heavy snow was falling and continued to do so for the next thirty-six hours. While this prevented extensive excursions from the hut, the most adventurous of the group made several forays into the snow plains and slopes that lie immediately above the hut to practice various skiing and snow boarding skills.

The heavy snow limited visibility to less than fifty metres and gave the hut an appearance worthy of a European Christmas card.

Later, it was clear that no respite in the weather was imminent, so several members of the group decided to ski to the summit of Mt. Nelse (which is nearly the third highest point in the state) despite the bad weather. From there it is possible to hit the Wagga IRLP enabled two metre repeater in NSW.

On the previous year's trip several contacts were made between VK3JNH on Mt. Nelse and VK3JPA operating as M0DCN in the UK via IRLP from this point using a hand-held. After a brief period at the summit, conditions became pretty difficult, but using the hand-helds on two metres, we were able to keep track of progress and ensure safety throughout the climb up the mountain

and the long ski back to the warm shelter of the hut.

After another session of working HF, another pleasant evening was enjoyed sipping port by the fire and recalling the great times of previous trips. By this stage the snow was over 180 centimetres deep in places and was absolutely ideal for cross-country skiing.

Unfortunately all good things must come to an end and by the next morning it was time for at least some of the group to head back to Melbourne for work commitments the next day. Several other members of the party benefited from another day of tripping about in the snow and had a few sunny breaks through what had been otherwise uninterrupted snow. After a total of five nights away (and with enough food to last at least another three!) the remainder of the group took down the antenna and packed away the radio. We had been lucky overall to have had extremely good snow and at least two days with good weather. Once again, amateur radio had been an integral part of the trip and for the first time we'd had some fun on HF. Already, we are considering improvements and refinements for the gear and looking forward to another trip to the snowy peaks of Victoria's Bogong High Plains next year.....

FT-817 and tuner

On the trip were:

Stephen Warrillow VK3JNH (author)

Gerard Warrillow VK3JPA (photographer)

Matt VK3HFI, Brendan M, Matt W, Steve V and Lindsay

ar

The secret radio in concentration camp 1942–1945

Arn van der Harst, VK5XV.

Although a fair amount of information is available regarding the P.O.Ws in the military concentration camps very little is known of the civilian P.O.W. concentration camps in South East Asia.

I was born and lived with my family for 14 years in Bandung (Indonesia) which was then part of the Dutch East Indies. My father was Chief Engineer of the Water and Electricity Supply in West Java. When the 2nd World War broke out it took the Japanese little time to conquer the Dutch East Indies. In 1942 all Dutch civilians were put in concentration camps, men separate from women and children. When boys reached the age of 14 years they were transferred to the men's camp and put in separate barracks on the same site as the men's barracks. During the last 6 months of the war the boys were isolated from the men. My total time in the concentration camp was 3 years, 2 years in the Tjihapit women's camp and 1 year in the old Dutch 15th Battalion men's camp. This story deals with the 15th Battalion concentration camp, which was formerly a military camp but during the war became a civilian concentration camp. Towards the later part of the war it had a total of 12000 civilian P.O.Ws.

The "Secret Radio".

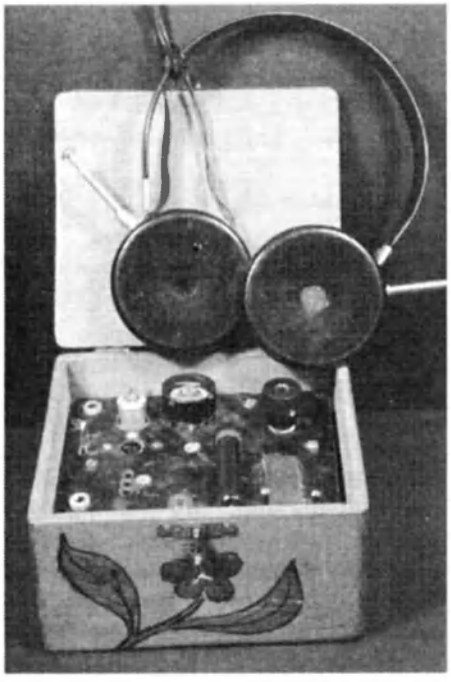
When I was all of 14 years old I was transferred to the 15th Battalion camp, I discovered to my surprise that my father was in that camp as well. With a bit of negotiating I was allowed to sleep next to my father instead of having to go to the boys camp because of his bad physical condition. After a while I was aware that there was a "Secret Radio" and my father knew about it, but he did not want to talk about it. Only a very few people knew about the birth of the "Secret Radio" and its use. At the time of the 15th Battalion camp becoming a civil P.O.W. camp a small workshop was installed under the direction of Mr. G.J. Vos, a brilliant man with a brilliant team, that could maintain, build and repair anything. The small workshop grew to a much bigger workshop, all sorts of things were manufactured, legal and illegal.

One day a Japanese guard entered the workshop with a radio that did not work anymore. He asked if the workshop could fix it for him. The answer was obvious, in no way could that radio be fixed anymore and, as a favour for him, they would throw the thing in the rubbish bin. Understanding the severity of that statement he quietly left. It took Mr. Vos and his expert team of Radio Engineers little time to work out the beginnings of a "Secret Radio".

Looking at the photographs will explain how it was done. The Radio Team designed a simple one valve receiver and a transmitter. It was built in metal boxes. Those metal boxes in turn were put in modified water flasks as used by the Japanese soldiers in the field. The water flasks were precisely copied and made by the engineering team of the workshop. Even the colour of the cloth cover of the flasks was very precisely matched. Apart from the few people who operated the gear nobody knew where transmitter and receiver were situated.

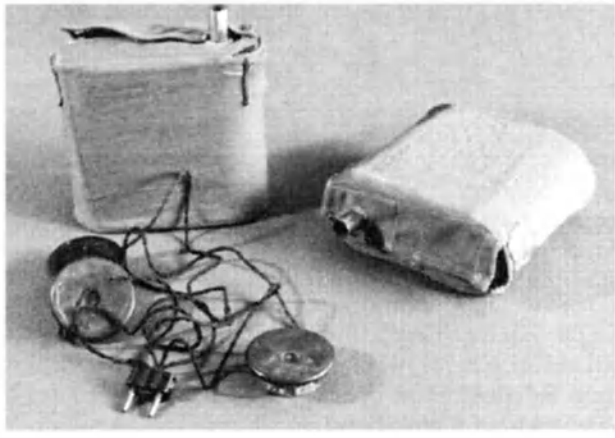
The receiver and transmitter worked perfectly right up to the end of the war and they were never discovered by the Japanese guards. It is interesting to note that, even with its extreme low power, contacts were made with radio amateurs in North Australia.

It is thanks to this radio that a select group was given the news from day to day and they then secretly whispered it to the rest of the prisoners. We knew



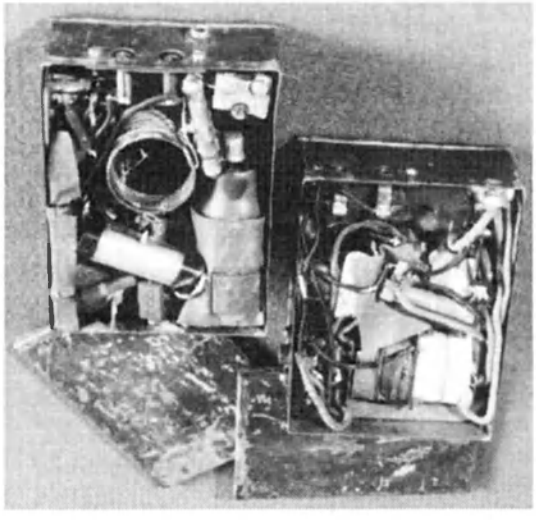
instantly of progress during the war, the dropping of the atom bomb on Hiroshima and finally the capitulation of Japan. Officially, nothing was said to the prisoners of the capitulation by the Japanese guards until a month later.

Mr. G.J. Vos survived the war. He brought back to the Netherlands the concentration camp "Secret Radio" he was so proud of. Many years ago he lent the "Secret Radio" to a firm for an exhibition. After many requests to return the radio, the firm refused to give it back. It was thanks to the stubborn nature of Mr. G. Schouten, close friend of Mr. G.J. Vos, that eventually the radio was returned to him while he was in hospital. Mr. Vos died a few days later. The "Secret Radio" is now with Mr. Schouten. It is thanks to him that I received the information and photographs I still needed.



I would also like to thank Mr. Jacque Slegtenhorst who helped me so much in my detective work. As for the Japanese guard, I hope he never reads this story if still alive!

ar



The secret camp radio various views.

WIA Comment

continued from page 3

assessors and to become amateurs. After all that's what it's really all about.

But how is all really going to work? What happens to the existing Group Leaders and Invigilators? What happens to the current system where the papers are marked separately from the examination venue?

With our current system, a club may have nominated one or more Invigilators, one of whom is the WIA's primary contact as a Group Leader. The Group seeks examination material from the WIA Exam Service for named candidates at a forthcoming examination. The papers are returned to the WIA Exam Service for marking and the WIA Exam Service advises the candidates by mail of their result.

We hope that many of the current Invigilators will qualify as WIA Assessors.

But we also see these teams from the clubs assisting the Assessors in arranging Foundation courses, and examination "events" as they are called, helping conduct the examinations as they do today, which is why the Assessor Instructions I referred to above use so far as practicable the same instructions for the conduct of an amateur radio examination assessment by a WIA Assessor as are used for the present examinations.

Sure, as I say above, the practical assessment requires the assistance of a WIA Assessor, but for the Standard and Advanced certificates, the current system can continue, at least until all the clubs have at least one WIA Assessor.

That is why, for these first assessor-training courses, we have sought to ensure that the candidates are all supported by their clubs.

Once again, the WIA recognises the essential role of the clubs in making this new world of amateur radio a reality.

ar

Antenna booster for hand-held scanners

Ron Holmes VK5VH

A need met

When I bought my VR-500 Yaesu 'Communications Receiver' Hand-held I was amazed at what this little device could do. General coverage reception from 100 kHz to 1300MHz in all modes, 1000 memories etc., etc. Who needs the internet for wasting time with this little instrument in your pocket?

The only point at which I was a trifle disappointed was that on the H.F. Amateur bands it was somewhat deaf. There were no problems with the powerful international broadcast stations, but DX on 20 metres was a bit thin. In fact there was not a lot readable on any of the H.F. bands. Of course, on an antenna 7 ½ inches long (19cm) it is asking a lot of any receiver to pick up low power twenty, forty and eighty metre transmissions, let alone 160 metres.

Remembering the remarkable success of my "Shack in a Briefcase" tunable mini-antenna (See A.R. July 2002) I wondered if a similar idea could be used in an even smaller system useable with a hand-held? The answer is Yes. I have designed an antenna which, with one 12 position switch, plus a miniature tuning capacitor intended for cheap transistor receivers, can tune everything from 1.8 MHz to 50 MHz with an increase in received power of at least 5 S points over the antenna provided.

In other words a signal which cannot be heard on the supplied antenna will be quite readable using the booster. A signal reading S1 or 2 on the supplied antenna will rise to 6 or 7 on the booster, sometimes more. Using the rough assessment of 1 S point equalling about 6 db this equates with a gain of around 30 db by the use of the tuned antenna booster.

This addition weighs practically nothing and has a metal handle attached. With the handheld clipped to the front of the booster box you can use it as conveniently as the hand-held alone. The handle is earthed so that in use you become the counterpoise.

Recently I used the rig in what I would call a 'worst case scenario'. Due to illness I was not able to get to the shack to join my regular Sunday night 80 metre net. I tuned up the hand-held on the frequency and listened in the lounge room. The normal S8 background noise was there and I doubted if I would read the signals through it. However, by using good quality earphones I was able to turn the gain back and made 100% copy on every net member from Noarlunga, 30 K south of my QTH, to Mintaro, 130 K north. On the supplied antenna no signals could be heard.

Normally, on 40 metres, I can read interstate skeds from VK4 to VK7. On 20 metres DX, any signal over S5 on my main rig, using a quarter wave vertical antenna, is audible on the hand-held. S9 signals come through at about S6. I have also found that HF broadcasting stations come up from S1 on the supplied antenna to S8 on mine. In short, 'the right parts make all the difference!'

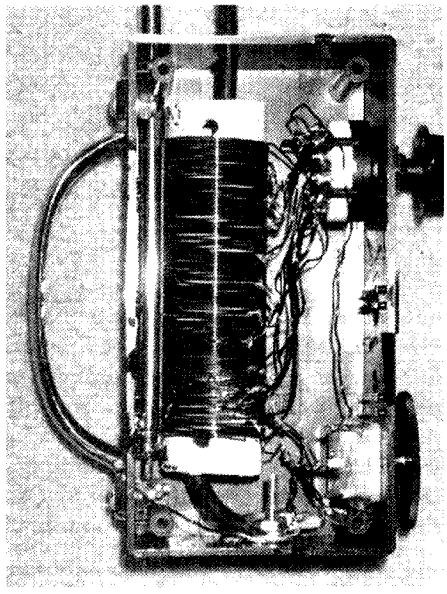


Photo 1. Close-up of the innards with the lid off. Perhaps it could have been tidier but I made a number of variations along the way before ending up with the final version. It did not seem worthwhile starting from scratch again. The tappings are arranged by making a slight kink in the wire while winding, or later, then scraping and tinning it. The longish bolt in the bottom is the earth point connected to the handle and other earthed parts of the circuit.

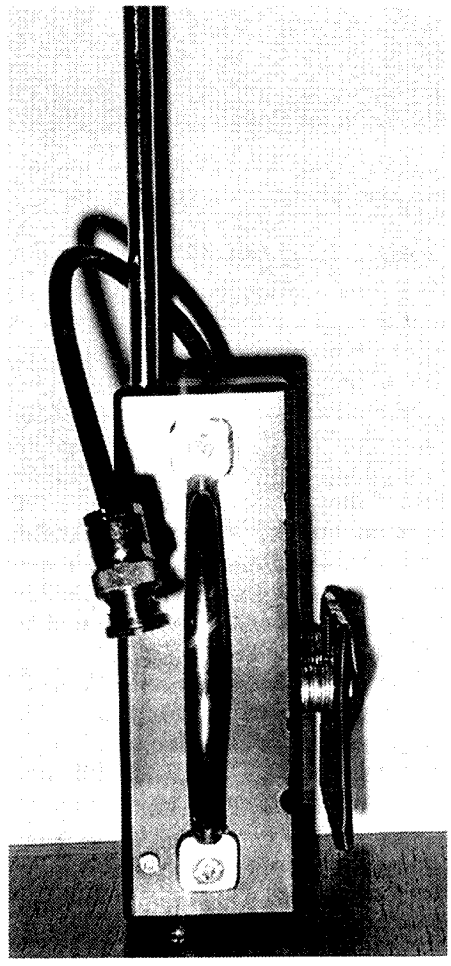
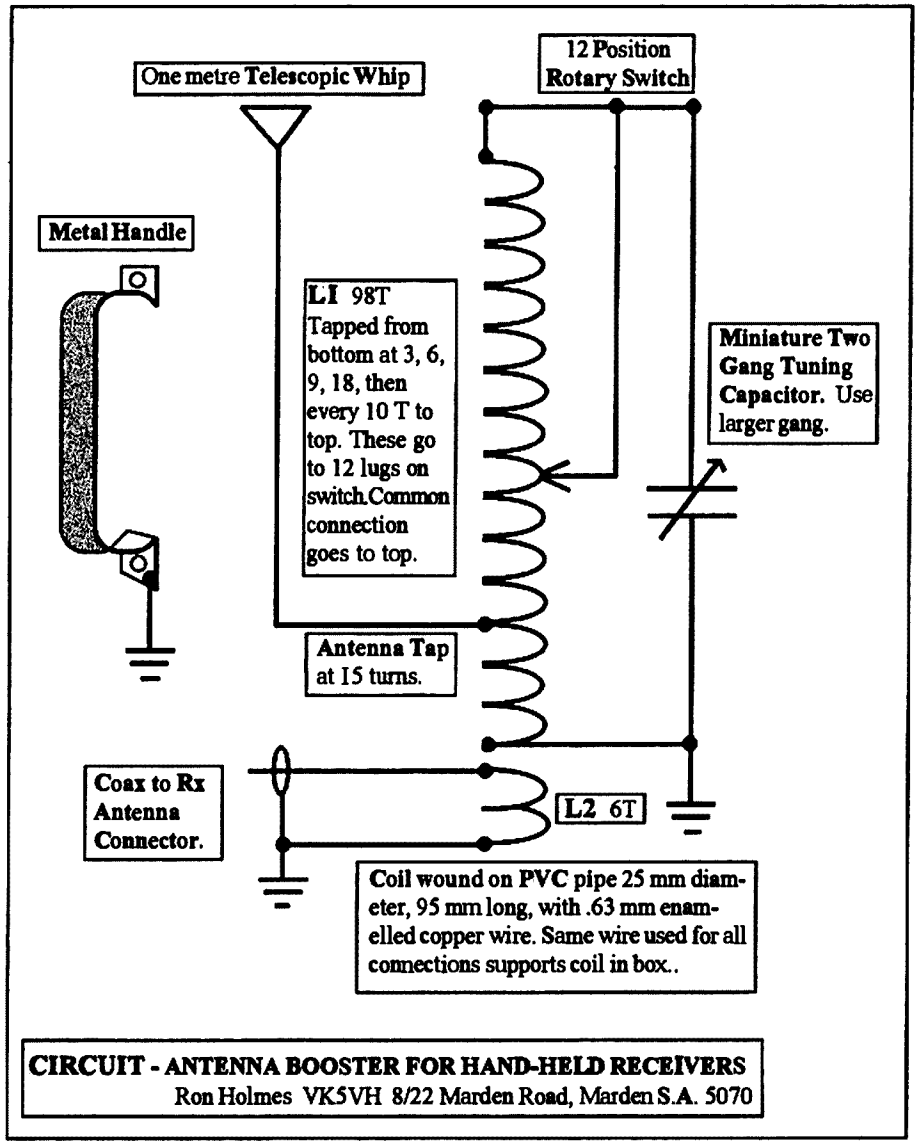


Photo 2. Side view showing positioning of handle, telescopic whip, connecting coax and the plate for the belt clip. The whip goes through a close-fitting hole in the back left corner of the case. The small bolt which secures it to the side of the case near the bottom is shown in this photo. The coax comes up through the inside of the coil former and out another close-fitting hole in the top of the case. See Photo 1.

Photo 3. The VR-500 attached to the booster and in use by the author.



The right parts

The circuit drawing indicates nearly everything you will need. It won't cost a lot. Twelve position rotary switches are widely available. The small two-gang tuning capacitor is a bit hard to find new, but there are plenty lying around in cheapie miniature transistor sets. (They are called miniature sets because one minute you're listening and the next minute you're not.) We are not talking air-spaced tuning capacitors here. This antenna is not intended for transmission.

The telescopic whip is half a cheap TV antenna bought at Cunningham's. The metal handle, 110 mm long, came from a hardware store. The case is a 'Jiffy Box' from Jaycar 130 by 67 by 44 mm. My coax has a BNC plug on the end to match the base of the supplied antenna. If you are making it for a different scanner the appropriate plug will be necessary.

The circuit plus the photographs should make everything reasonably clear. In use, the VR-500 belt-clip slips firmly over a plate of wood, plastic or metal 2 or 3 mm thick. Mine is three-ply covered with black tape. It is 50 mm long by 70 mm wide, bolted to the lid of the case, with spacers holding it 10 mm out. The top is 70 mm up from the bottom of the case. This allows the whole set-up to stand on a flat surface if desired. Make sure it allows clearance to the bottom screws of the lid. Again, a different rig may need a different arrangement.

Incidentally, if you are using the rig with earphones you can stand it on a table and not need to touch the handle as a counterpoise. The phone cord does the trick.

ar

RD reminiscing *continued*

My Father died in September, 1940, my sister's boyfriend went to the Middle East with the 7th Divvey. He returned to Melbourne on 18th April, 1942, married one week later on 25th April and was posted to New Guinea. By the time I returned from there he was discharged and they had two children.

The wonderful thing to come out of this is the friendship, despite social background, distance, religion, anything! For example, recently I went up to Melbourne and met up with five other "New Guinea Girls" – we do this twice a year. I have a long list of Christmas cards all over Australia.

The news that peace was declared reached us during the morning of 15th August, 1945. We were given the half day off; a dance was held in the recreation hut, open to all and sundry. Then back to work next morning! Strangely, none of the wild celebrations occurred which were seen throughout Australia!

I can reflect on friendships and comradeship and the heartaches. War is a terrible thing, but so is the threat of invasion. Nevertheless, it showed that here was an opportunity for women to contribute in a meaningful way.

ar

An HF – 6 metre antenna diplexer

Keith Gooley VK5OQ

What is it

Basically it's a three port filter designed to allow a single transceiver to drive one of two antennas depending on the frequency.

Many late model HF ham transceivers include the 6 metre band and utilise the same RF coaxial connector for the full range of 160 m to 6 m. This is due to the capability these days to readily produce a 100 watt solid state PA covering the whole range.

However, most hams don't use the same antenna for HF as they do for 6 m. A three element tri-bander might be typical for the higher HF bands and a 4 or more element Yagi for 6 m. Alternatively a G5RV dipole might be used with an antenna tuner on HF and a vertical J-pole or quarter wave on 6 m. For portable field day operation I have used a 40 m half wave dipole for HF and a Moxon Rectangle for 6 m. Most readers will realise the inconvenience of having to unplug the HF antenna and plug in

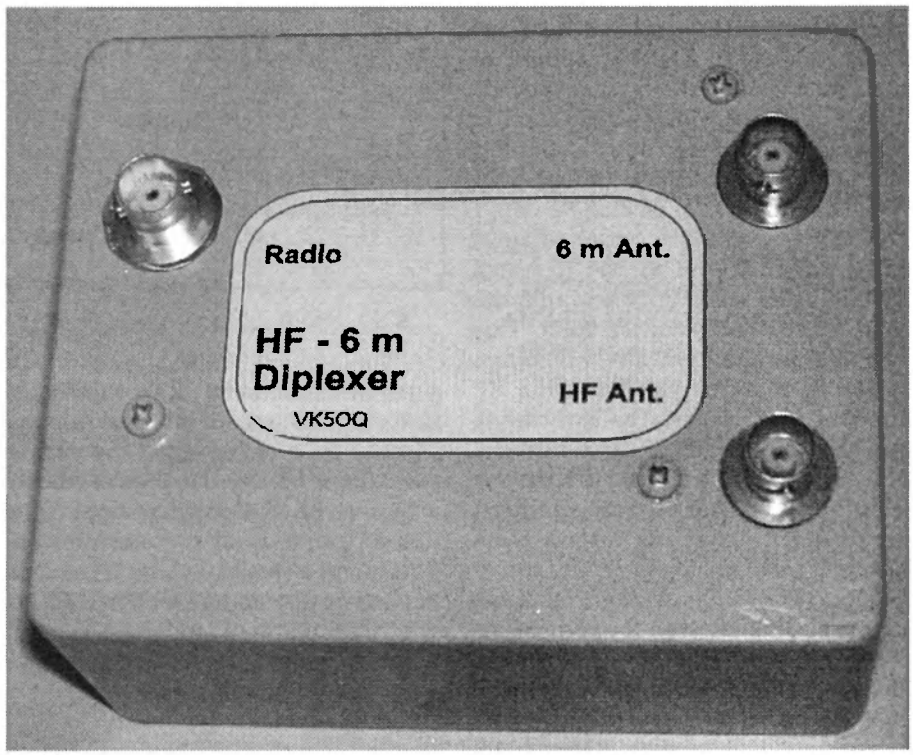


Photo 1. The HF – 6 m antenna diplexer front panel view.

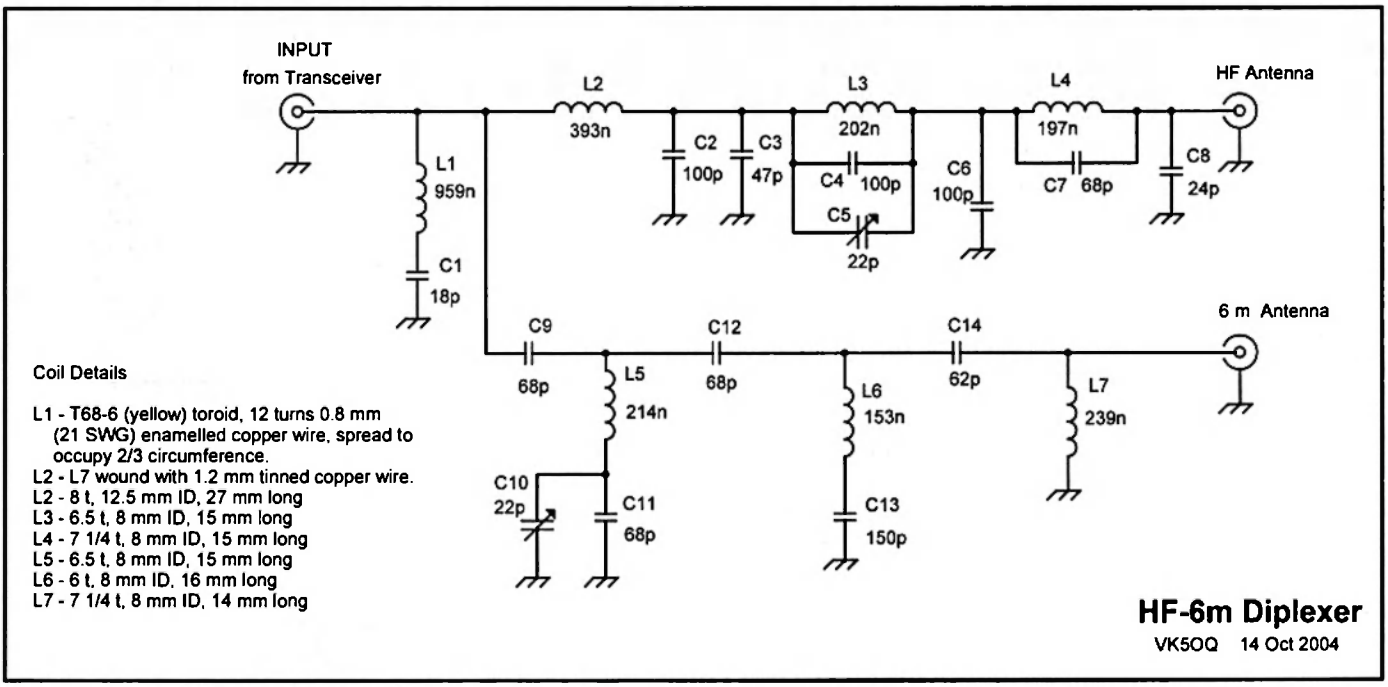


Fig 1 – Schematic of the diplexer.

the 6m one when wanting to change to 6 m operation. This diplexer gets around the problem and both antennas can be left connected to the transceiver with the diplexer directing the signal to the appropriate connector.

Circuit description

The diplexer consists of a low pass and a high pass filter with the inputs of each parallelled. This is possible without disrupting the passband response of either filter because the input impedance of each filter outside its passband is designed to be high, so that neither filter significantly affects the other in its passband.

The filters are 6th order elliptic and I am indebted to the Nuhertz Technologies website (www.nuhertz.com) for the design of the filter. This company has produced a very thorough suite of programs for designing RF filters of many types. The software is available free for download in a 30 day trial version. In addition Nuhertz has on its site a number of example filters, one of which suited this purpose quite closely. It was a 75 ohm filter with corner frequencies of 30 and 40 MHz. Some simple scaling allowed me to produce a design which does the job very well, having corner frequencies of 30 and 48 MHz and a 50 ohm characteristic impedance. To change the characteristic impedance from 75 to 50, just multiply the L's by 50/75 and the C's by 75/50. Then to move the upper corner from 40 to 48 MHz, the L's and C's in the high pass filter are multiplied by 40/48.

An extra series LC network (L1 and C1) was included in the original design across the input to improve the input SWR at the high end of the HF range and at 50 MHz.

Components

All the inductors except L1 are air wound and should be readily duplicated by constructors. The coil details should be followed as closely as possible. L2 was wound on a 12 mm drill and L3 to L7 were wound on a 7.5 mm drill. Wind the coil close-wound with adjacent turns touching to start with, and then pull the turns out to reach the specified coil length when the turns spring back. I then put two runs of hot-melt glue along each coil to hold the turns in place. The glue had no measurable effect on the Q.

Design values for the inductances are given on the circuit for those constructors having a means of measuring the inductance. L1 has a larger inductance than the others and is conveniently wound on an iron powder toroid. Type T68-6, painted yellow was chosen. This toroid is available from R J and US Imports or distributors for about $2.40. Wind the turns evenly and space them out to occupy about 2/3 of the circumference of the toroid. Squeezing them in closer or spacing them out more will change the inductance significantly.

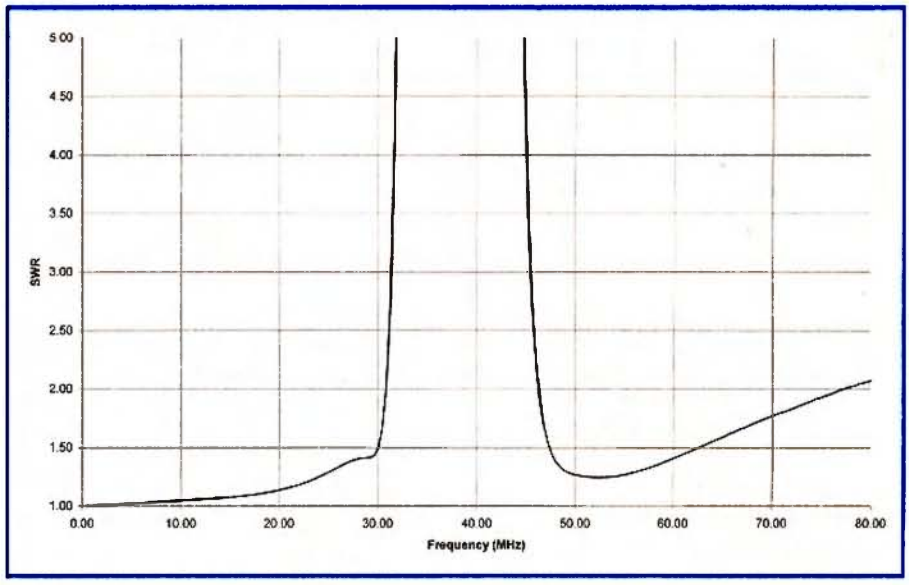


Fig 2 – SWR at the transceiver port with the antenna ports terminated with 50 ohms.

The choice of capacitor type for an RF filter for power application is limited. Above 10 watts or so the only type that is suitable is mica, silvered or otherwise, apart from perhaps large transmitting type ceramic which are expensive. At lower power levels small ceramic

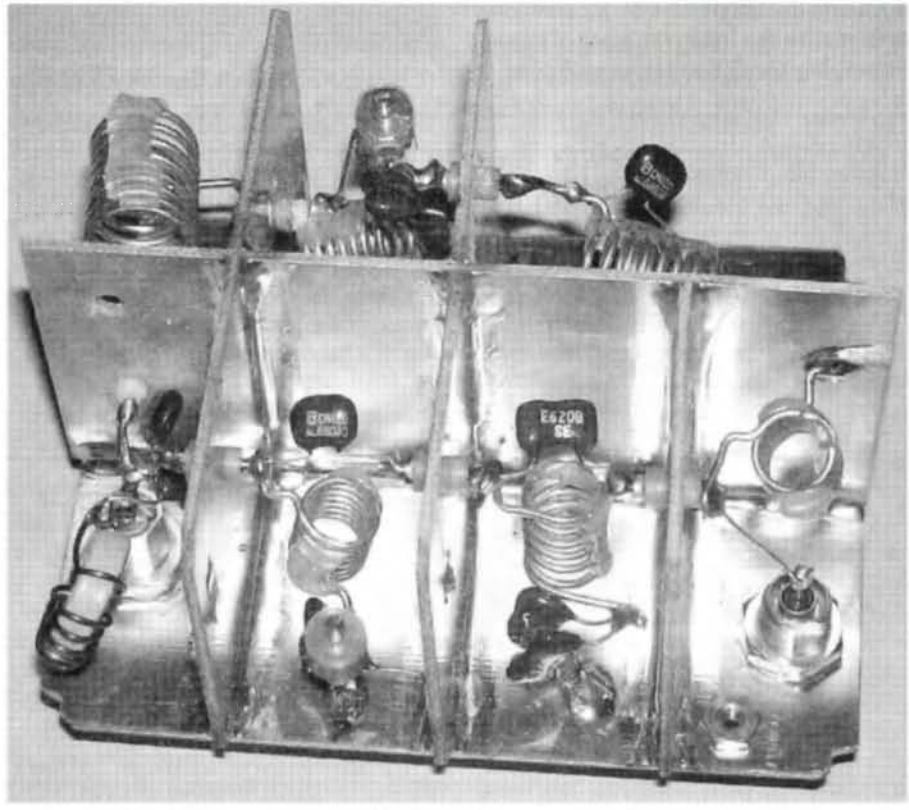


Photo 2. Internal view of the diplexer showing the high pass side.

capacitors can be used. Mica capacitors are not readily available though many hams with a sizeable collection of "junk" will have a stock of these and several units may be parallelled to make the required value. Both Farnell and Radio Spares stock silvered mica capacitors which would be quite suitable but they are expensive, $2.50 to $4.50 each.

Construction

As in all RF projects where significant power is involved some kind of metal box should be used. My diplexer is housed in a diecast box reclaimed from a disused project. The photographs show the construction method used. The base and shielding partitions were made from double-sided copper laminate soldered at the seams. It is not necessary to provide all the shielding as shown. The diplexer will work quite effectively, assembled on a flat base as long as adjacent coils are oriented at right angles to minimise mutual coupling.

Two trimmers have been included, one in each part of the diplexer. I found that the SWR at the filter input could be improved by adjustment of these trimmers.

Testing and adjustment

Connect 50 ohm loads to both antenna connectors and apply a signal at low power, a few watts, near the top end of the 10 m band to the diplexer input. Adjust trimmer C5 for lowest SWR. Change frequency to the bottom end of the 6 m band and adjust trimmer C9 for the lowest SWR. The two plots show the SWR at the input of the diplexer. The worst is 1.5 at 30 MHz, falling to 1.15 at 21 MHz. Over the 6 m band the SWR is 1.25.

The response plots show that the loss at 30 MHz is 0.6 dB falling to 0.15 dB at 21 MHz. The loss in the 6 m band is 0.3 to 0.4 dB. 0.4 dB represents a little less than 10% of the power.

Conclusion

This diplexer enables an HF antenna and a 50 MHz antenna to be connected simultaneously to an amateur radio transceiver with a common RF connector. It causes a minimum of disruption to the match of the antennas and feed lines to the transceiver and as an added bonus, it has more than 35 dB of rejection to harmonics above 35 MHz when used on HF.

ar

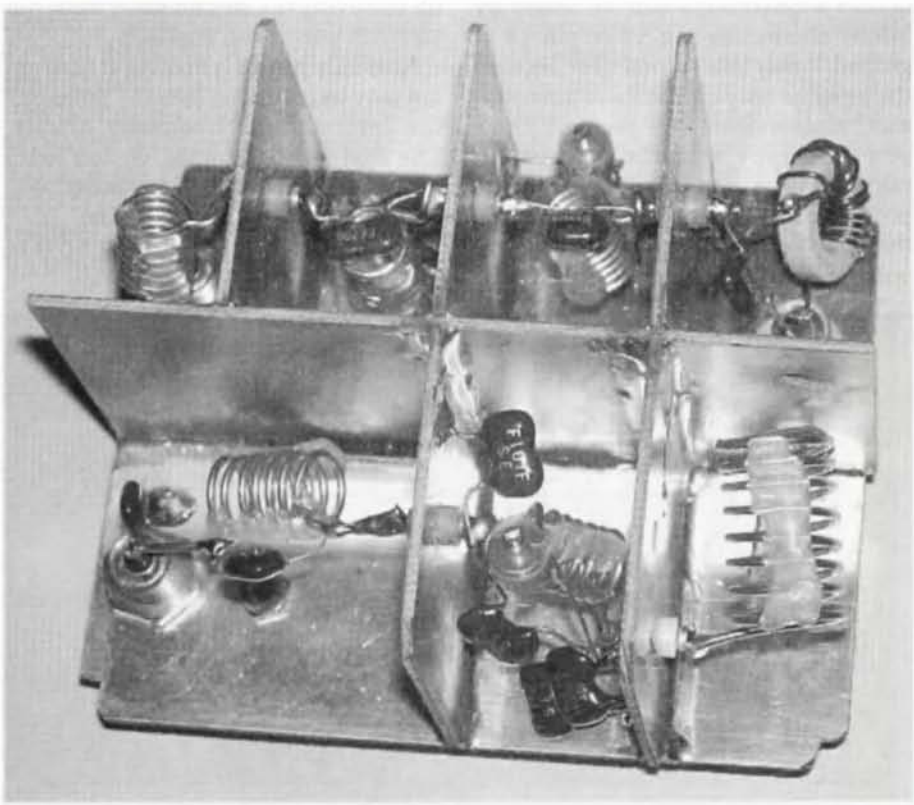


Photo 3. Internal view of the diplexer showing the low pass side.

The 2002 DFD updated

Phil Rice VK3BHR
http://ironbark.bendigo.latrobe.edu.au/~rice

Here is an updated version of the Digital Frequency Display, published in Amateur Radio in September 2002. Since then I have learned quite a bit about PIC programming and, with inspiration from a Web page by IK3OIL, have managed to perform all counting functions "on chip".

This version features a much simpler front end, an extended frequency range and a coarse calibration function implemented in software. It retains the ability to add or subtract one of three IF offsets, making it suitable as a frequency display for a direct conversion or superhet receiver (also for transmitters using "on frequency" VFOs or using mixing). Resolution remains at 10 Hz and accuracy is in the order of 100 Hz.

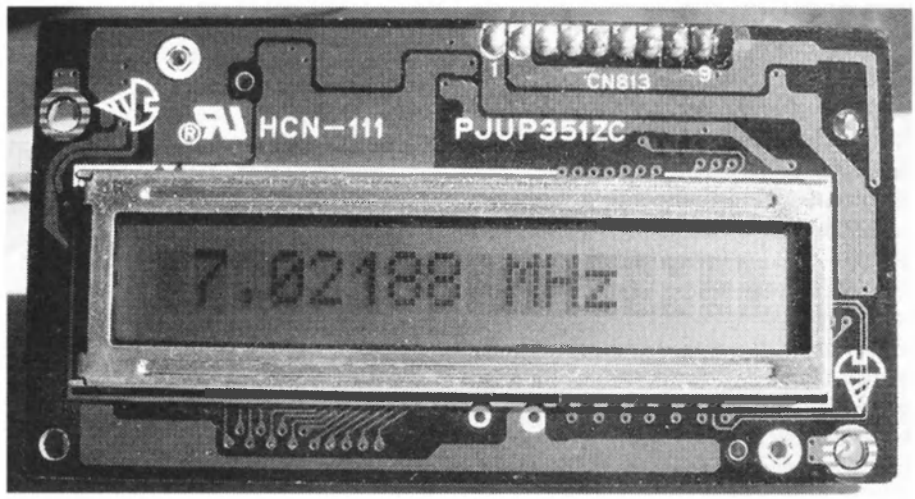


Photo 1 – LCD frequency display

How it works

A self biased common emitter amplifier produces a pseudo-TTL driving signal. The 10 µH inductor in the collector lead helps extend the high frequency response. Any "fast" NPN transistor should be suitable. I used a BFR91, but you may substitute a transistor scrounged from an old TV tuner or a VHF receiver.

The amplifier's quiescent Vce is set to 1.8 to 2.2 volts by the resistor marked * on the diagram. It is nominally 10 k, but you may need to change it. The collector voltage is applied to the PIC's counter/timer via a series 470 ohm resistor. The PIC is able to short this signal to ground via an internal pull-down transistor to disable counting. It is crude, but quite effective.

The PIC implements a 32 bit counter, partly in internal hardware and partly in software. Counting is enabled by turning off the internal pull-down transistor for "exactly" 0.4 second. At the end of this time, the PIC divides the count by 4, then adds or subtracts the appropriate IF frequency to get the actual frequency. The resulting count is converted to printable characters and delivered to the display.

Setting up

Before the frequency meter will work at all, it must be calibrated.

This involves starting with the power off. Pin 10 is connected to ground and the power is then turned on (and held on). The PIC will measure and display the input frequency, followed by the letters CAL. If you can't adjust the indicated frequency to the correct value (by adjusting the 33 pF trimmer), then coarse adjustments can be made by briefly connecting pin 12 or pin 13 to ground. It may take several tries; because the program only checks these pins once each measurement (0.4 second). Once you are happy with the adjustment, remove the ground from pin 10 (while power is still applied). This will cause the PIC to store the calibration in non volatile internal memory.

If you are lucky and use a 4 MHz crystal that is similar to mine, calibration may be as simple as (a) shorting pin 10 to ground, (b) turning the power on then (c) removing the ground short from pin 10 (with power still applied).

Normally pin 10 is floating at turn on, but may be grounded later to "program" the Intermediate frequency offsets. The next few paragraphs, copied (with amendments) from the September 2002 article describe how this is done.

To program the intermediate

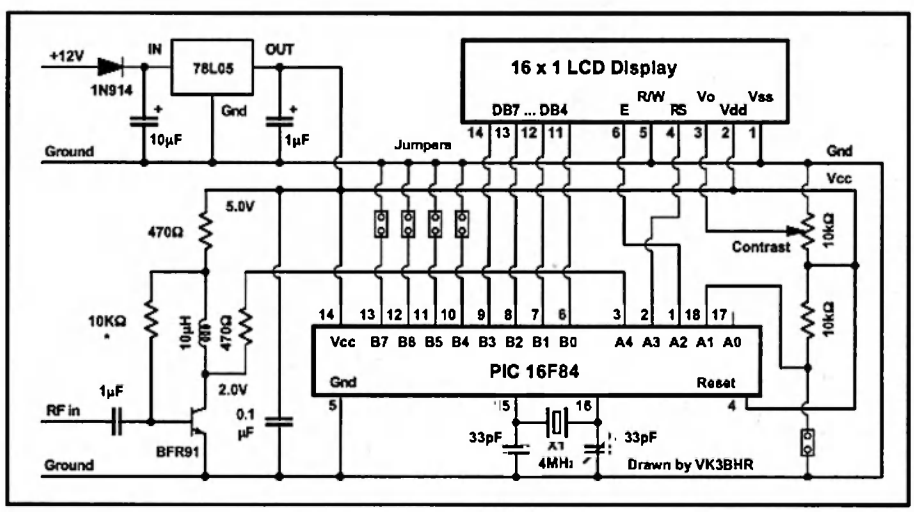


Fig 1 – Circuit of the updated Digital Frequency Display.

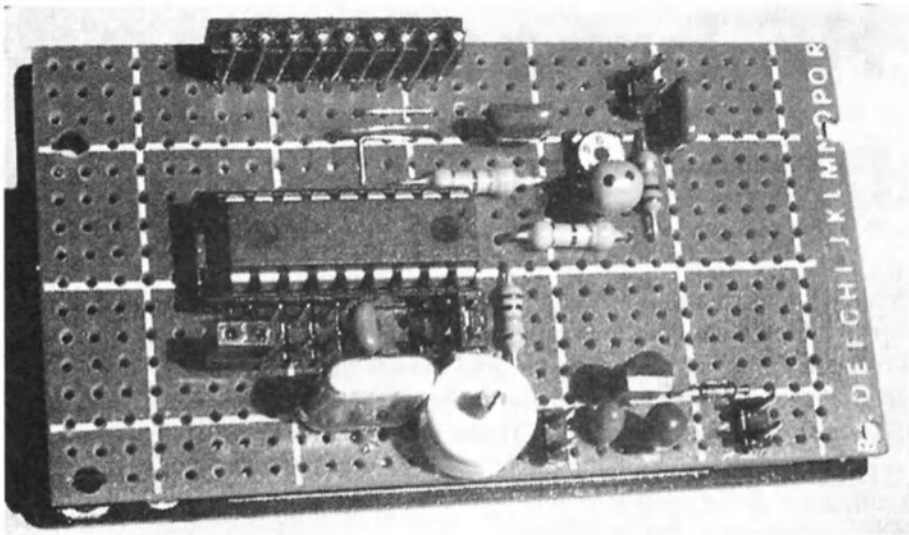


Photo 2 – Component side of the circuit board.

frequencies, connect the BFO to the counter then set up the PIC as follows: ground pins 12 and/or 13 of the PIC to select one of three IF offsets. Pin 12 when pulled low, indicates the BFO is on its lower frequency. Pin 13 when pulled low, indicates the BFO is on its higher frequency. Alternatively, you can pull both pins 12 and 13 low to use the third offset. If both pins 12 and 13 are left floating, the PIC will not actually store anything!

To store the measured BFO in the selected internal EEPROM, just ground pin 10 of the PIC for at least 0.5 second, then release it.

For normal operation, the RF input of the counter is connected to the receiver VFO and the PIC uses the stored IF offsets to calculate the actual frequency. If neither BFO selection pin (12 and/or 13) is pulled low, the PIC uses the average BFO frequency. If no IF offset is required, just measure and store 0 Hz for both offsets. Alternatively, you can pull both pins 12 and 13 low to use the third offset (which must also be programmed to 0 Hz.)

Pin 11 when held low, indicates that the selected IF is to be added to the measured VFO frequency to give the indicated frequency. If pin 11 is floating, then a subtraction is done (VFO-IF or IF-VFO, whichever is appropriate).

Some LCD displays are configured as "8 character by 2 line" but with all the characters displayed on the one line. To cater for these displays, the PIC tests pin 18 occasionally. If it finds this pin grounded, it inserts a "move to line 2" command after the eighth character. If your display only shows eight characters, then try grounding pin 18 of the PIC.

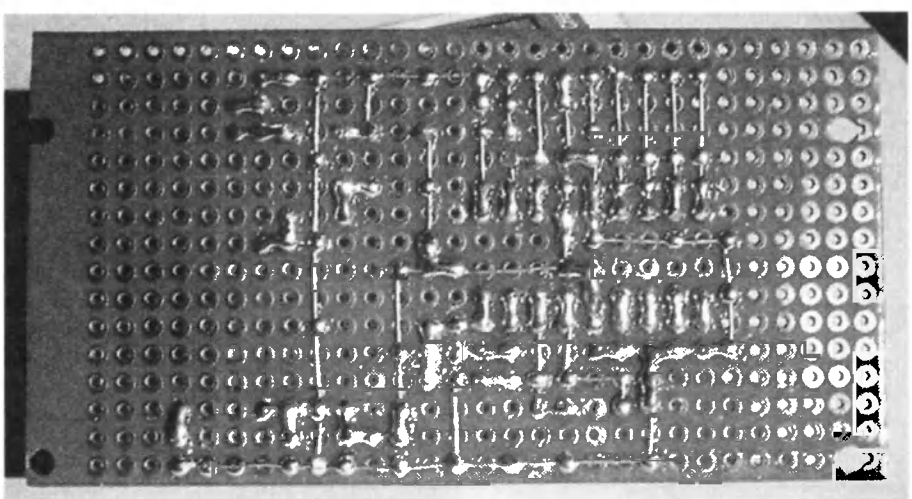


Photo 3 – Underside of the circuit board.

Getting the software

The source code for this version is available on the web at http://ironbark.bendigo.latrobe.edu.au/~rice or I can mail a copy on disc.

If you don't want to go to the trouble of building a programmer and downloading the software (you will also need the Microchip PIC assembler), then I could visit my local Jaycar store and buy a chip. A cheque for $15 would cover my costs (the price of the chip plus postage).

The last word

This frequency meter has much simpler hardware than the 2002 version and, because of "improvements" in the software (32 bit counter instead of 24), has a higher frequency limit. The 2002 frequency meter was hard limited to 41.94303 MHz. This one exceeds 50 MHz, limited only by the PIC's counter/timer. The prototype was still counting reliably at 60+ MHz.

ar

Practical HF broadband wire antennas

Marc Robinson VK2BUA
www.pca.cc

Early in my training I was taught that an antenna must be cut and tuned to a multiple of a quarter wavelength, if it is to radiate efficiently. That statement still holds true but we can bend the rules and trade a bit of the efficiency for bandwidth when we need it. Such is the case with the lengths of wire described here. All are proven in commercial installations I have engineered here and there along the track. Back in the 80s I used to make up and sell a 'Starters Kit' for those wanting to likewise dabble. These days you are on your own!

Why broadband?

Modern high frequency radio communications networks demand great flexibility in antenna design. Channel scanning, frequency hopping and cross band working all call for antennas that have to work instantaneously over a very wide bandwidth, sometimes the complete HF spectrum.

Why wire?

Wire antennas are generally simple to erect. They can often be supported from existing masts, trees or buildings and a multitude of designs can be constructed that will satisfy the broadband requirement. These can be as elaborate as a 'Rhombic' or 'Vee Beam', or as simple as a 'Dipole' or 'Long Wire'.

Antenna or dummy load?

While they come in many shapes and sizes, the configurations briefly outlined here are all classified as 'Travelling Wave' Antennas (TWAs) and to be more precise, 'Ground Terminated' TWAs. They have also been called 'Radiating Dummy Loads' by the unkind, which carries a small degree of truth when the size is restricted. To be efficient for transmitting, particularly on the lower frequencies, 'big is beautiful' and they require a rather large amount of 'Real Estate'. However, they can be designed to be directional and have quite reasonable gain. Another very favourable feature is that they generally present a stable load for the transmitter driving them, resulting in a maximum transfer of power, a cool transmitter and clean transmission.

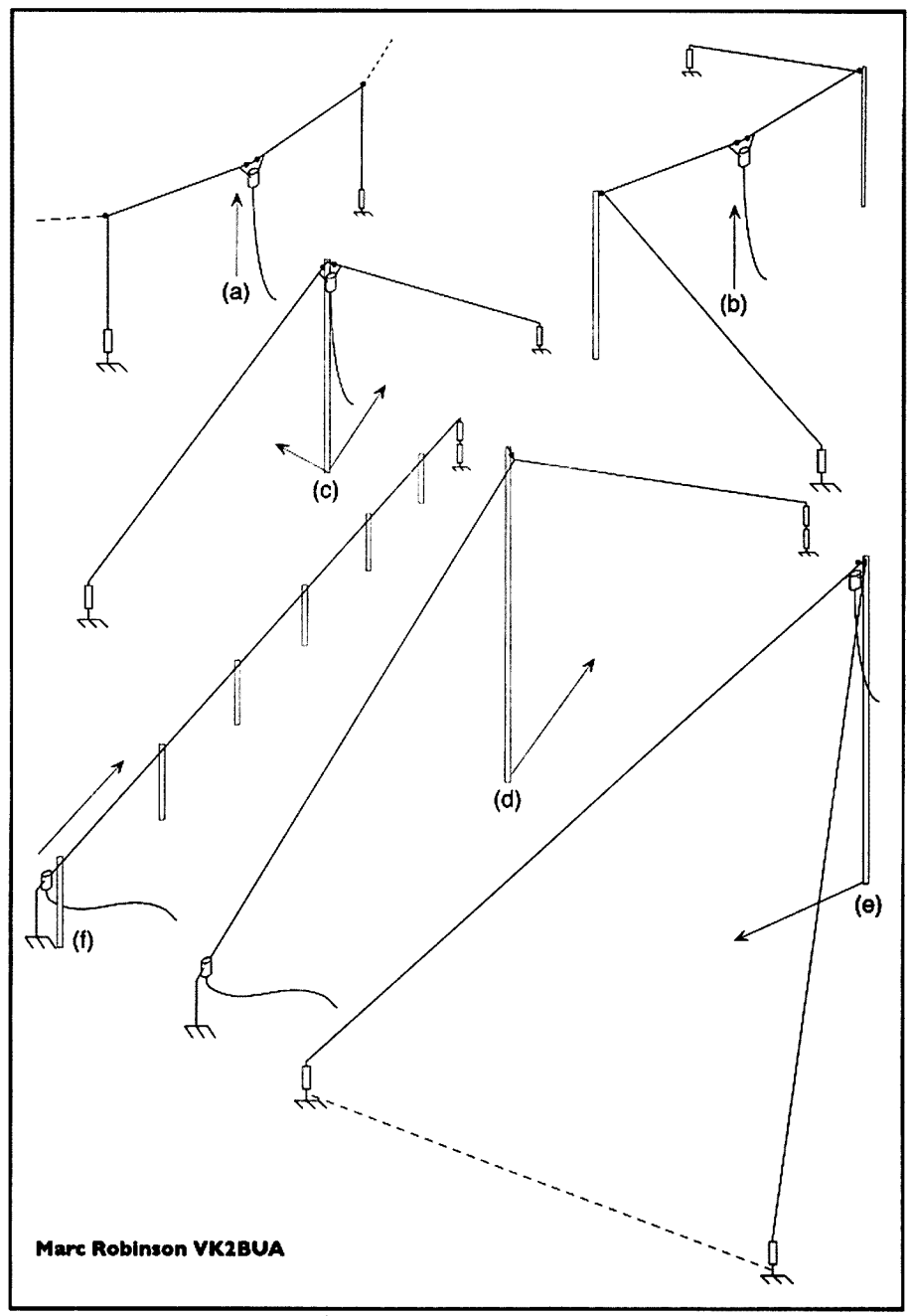


Fig 1 – A few practical wire antennas (see text).

Reception?

Ground terminated TWAs make very good receiving antennas because the terminations prevent any static build up on the antenna wire, keeping the noise level low.

Which antenna?

While 'boffins' might at this point get out a site plan and run up their PC antenna simulation programs to come up with the perfect design, Figs 1(a) to (f) give a few practical designs. Suggested dimensions are all 'very flexible' and can be varied by 20% or more without worry.

(a) illustrates a centre fed dipole strung between two supports, masts, trees, etc. The ends of the dipole are dropped vertically to ground level where each connects via a 'Terminator' to ground. Suggested dimensions for 2-30 MHz operation are 35 m (115 ft) across the top with 15 m (50 ft) down drops. This antenna is basically omni directional, providing high incidence radiation at lower frequencies for local working out to about 1500 km or 950 miles and higher frequency low angle radiation beyond.

(b) is the same antenna, but with the down drops taken out in some direction beyond the supports. This is a way to extend the length of the antenna and so improve performance on 2 MHz frequencies and lower. Don't lengthen the down drops to more than about twice the support height.

(c) is a centre fed inverted vee configuration. It may be more practical to have one taller mast, say 30 m (100 ft) rather than two smaller ones like in (a) and (b). Each leg length should be about twice the mast height. Radiation is omni directional at the low frequencies, becoming bidirectional as the frequency increases.

(d) uses the same physical construction and dimensions as (c) but the feed point is shifted to one end and the other is terminated. Radiation is in a direction away from the feed point towards the terminators. This antenna is effectively a vertically polarized 'Half Rhombic', with the missing half being mirrored by the 'ground'.

(e) is also a 'Half Rhombic', this time horizontally polarised and commonly known as a 'Vee Beam'. Mast height should be as high as possible to keep the vee as steep as possible, resulting in low angle radiation for long distance working. A good apex angle for the vee is 60 degrees with maximum radiation from the vee opening. Six legs could be arranged symmetrically from a single centre pole, preferably on high ground with the legs dropping down to lower ground. Relay switching could select pairs of legs in turn to form a 360 degree steerable antenna.

(f) is a form of 'Beverage,' more suitable for reception than transmission. It consists of a single wire run 1 to 2 metres off the ground along a fence top for quite a long distance, say 50 to 500 m. This antenna receives very well at LF and medium wave where it is directional from the feed point to the terminators. At HF it radiates almost directly upwards, depending up earth conditions beneath it.

Key components

Two essential items are needed to put any of these antennas together:

The first is a 50 to 600 ohm IsoTran (Isolating Transformer) - see Fig 2 - with a power rating to suit the transmitter output. Depending on the design, a TWA will generally have a feed impedance between 450 and 750 ohms, so 600 ohms is a good compromise. Why not a Balun (Balance to Unbalanced) transformer which is so commonly used to couple a coaxial cable to a balanced antenna? The balanced winding of a Balun effectively has a centre tap connected to the braid side of the unbalanced winding. This presents no problem when the antenna is constructed with perfect symmetry, both legs of the same length, no objects close to one leg and not the other, etc. Many of the antennas described here are unbalanced because of odd leg lengths or ground terminations. Any antenna imbalance causes out of balance currents to flow through the local ground system and back along the braid of the antenna coax, inducing noise or RF radiation. For this reason a Balun is not recommended. A much better choice is an IsoTran with isolated primary and secondary windings of the correct ratio. This allows the Antenna to 'Float' and take up a natural balance above ground without inducing currents into the coax feed line.

The second item is a pair of 300 ohm non inductive wire wound resistors (Terminators) which are used to terminate the far end of each leg of the antenna to ground, hence the 'Dummy Load' analogy. Note that in the case of end fed models, both terminators are connected in series to ground at the far end of the antenna. Each 'Terminator' should have a wattage rating of at least

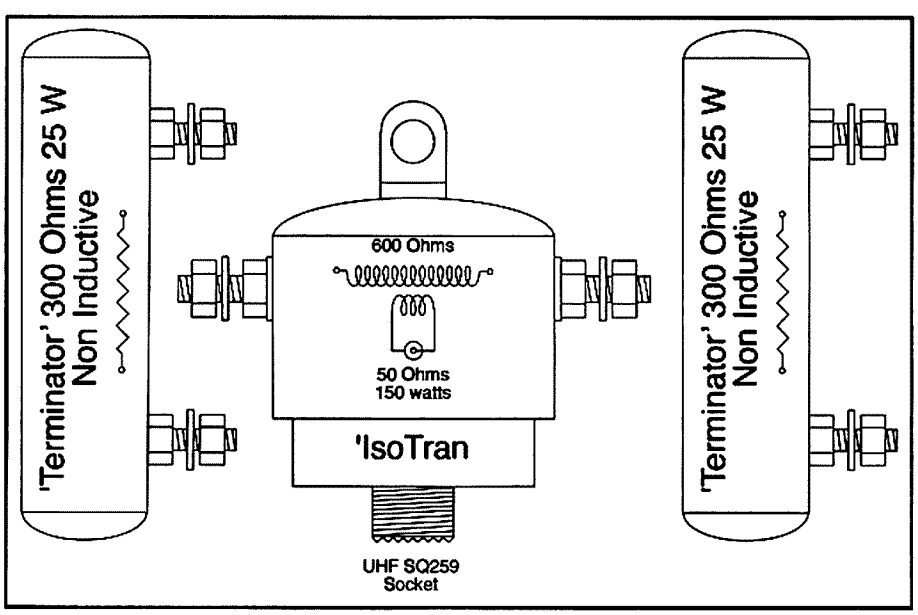


Fig 2 – A little starter kit I used to make and sell under my IsoTran brand back in 1980-90. I'm sure alternatives can be sourced or made up to suit.

20% of the transmitter PEP for voice transmissions or 40% for continuous data. The amount of power dissipated in the 'Terminators' depends on the length of the antenna and the frequency in use. The shorter the antenna or lower the frequency, the more the 'Terminators' become the 'Dummy Load'. CAUTION: they could become a fire hazard if they overheat from excessive transmitter power and so, must be positioned and supported appropriately.

Other bits and pieces

What to make the antenna from? A visit to your local boating warehouse should provide the answer. You can't go wrong using very flexible small diameter stainless steel wire rope. Don't let anyone tell you that stainless has too higher resistance. A 2.5 mm (3/32 in) 7x19 strand stainless rope has a lot more surface area for RF to flow on than single or seven strand hard drawn copper wire. What's more, it is far more flexible and has a breaking strain around 420 kg or 990 lb. You will need a quantity of 2.5 mm copper swages, a hand held swaging tool and a 'Parrot Beak' wire rope cutter. The tools are a bit expensive but once you have used them, you won't go back to copper wire, wrapping and soldering. The same warehouse should also have a good selection of pulleys and 'UV proof' nylon rope to support the antenna. Pulleys and counterweights are essential to avoid damage when the supports are trees that sway in the wind. A good counterweight is a sturdy plastic bucket with a few holes drilled in the bottom so it will drain, filled as necessary with sand and rocks to tension the antenna. You will need to source a supply of strain 'Egg' insulators and ground stakes and clamps (probably from your local electrician).

Coax cable

I won't go into too much discussion on coax cables and connectors, except to say; don't hang the down drop of coax from the IsoTran by its connector. Loop and tie the coax through a spare 'Egg' insulator before fitting the connector and hang the insulator and IsoTran from the antenna, between the two centre insulators. Use RG58C/U coax cable with a stranded centre conductor for receivers or transmitters up to 400 watts, or RG213 for higher power or runs longer than 30m. Only use coax connectors which have a soldered centre pin and sealing gland that does up on the outer braid and sheath. Have self amalgamating tape ready to weatherproof them.

Rigging

Antenna assembly is relatively easy when using stainless wire and swages. It's a matter of slipping a swage onto the wire, threading the wire around the insulator and back through the swage. Leave more than enough tail to go to the IsoTran or Terminator, slip the swage up close to the insulator or thimble and crimp with the swaging tool. To terminate the tail on the IsoTran or Terminator, form an eyelet by pushing the wire through a swage and then back on itself. Make the eyelet a snug fit on the terminal before crimping the swage. By now you will probably have stuck yourself a few times with the sharp ends of the wire strands. Tape the ends so you don't catch your fingers further when rigging the antenna. If you have a 'Sea Scout' or 'Ancient Mariner' in the team, tying off or splicing the nylon rope on the insulators will be no big task, otherwise pick your best knot and hope it holds. Always melt the nylon end strands of the rope tails to prevent them fraying and unraveling. (A cigarette lighter and glass of water required). Don't touch the molten nylon unless the team includes a doctor.

Grounding

Since the Terminators themselves are 300 ohms, the resistance of the ground connections for these antennas is not as critical as it would be for say, a quarterwave ground plane antenna, where the base impedance may be as low as 10-20 ohms. Nevertheless, a few rules must be applied. Don't elevate the Terminators. Keep them low to the ground and the lead to the ground stake or buried ground wires should not exceed 1 m or 3 ft. Likewise for the IsoTran on end fed antennas where one side of the 600 ohm winding of the IsoTran must be grounded. In dry ground use multiple ground stakes or run a buried ground wire between the two Terminators at each end of the antenna.

So, go pull up some wire!

ar

Notes on HF transmitting coils

Drew Diamond VK3XU

Inductor coils are used in just about every item of radio equipment whose performance largely depends upon coil efficiency. Indeed, transmitting coils are a hot topic, so it is a pity that much of the accumulated wisdom regarding practical coils (such as that contained in References 1 and 2) has not been fully carried over into contemporary amateur literature. Never-the-less, a web search generally produces plenty of worthwhile material (eg Reference 3).

Good electrical conductors carry alternating currents only to a certain depth due to the flux produced by the conductor itself, and is a function of the current's frequency. Depending on the size of the conductor, it becomes so pronounced at very high radio frequencies that practically all of the current flows in a thin layer on the "skin" near the surface of the conductor, which effectively increases its resistance. A more lucid explanation may be found in Reference 4.

Another factor which seldom gets a mention in amateur texts is "proximity-effect". When two or more adjacent conductors (as in a radio coil) are carrying an RF current, the current distribution in one conductor is affected by the magnetic flux produced by the adjacent conductor(s), forcing the current to flow on the surfaces of the conductors that lie adjacent to their neighbours, thus causing the effective resistance to be higher than for skin-effect alone (see Reference 1, p36, and Reference 5, p119). Proximity effect can be reduced by space (rather than close) winding the turns. Edge wound copper strip is sometimes used professionally to further reduce this effect (Reference 1, p37 and Reference. 3).

The "goodness" or (Q)uality of an inductance at a particular frequency is indicated by its Q, which is a figure of merit defined as "the ratio of energy stored to energy dissipated per cycle", and may be expressed as pure reactance/ effective resistance –

$$Q = \frac{X_L}{R}$$ ...(Reference 5, p108).

Effective resistance of a coil for high frequency work is determined by several considerations. Chiefly they are physical size, conductor material, dielectric material (both on, and near the coil's wire), magnetic core material (if used), form factor, being the ratio of winding length to diameter (for a plain solenoid), and the electro-magnetic nature of any objects within the coil's field.

The oft-quoted (and quite accurate) Wheeler's formula for inductance is (Reference 1, p55, here metricated courtesy of Tim Hunt VK3IM):

$$L_H = \frac{0.0098 \times N \times N \times d \times d}{1 + 0.45 \times d}$$

where N = number of turns, d = diameter in cm, l = winding length (of the coil – not the wire) in cm.

Depending upon the application, there are many conflicting factors affecting the design. However, some empirical "rules of thumb" may be applied to the sort of solenoids we use for antenna couplers, power amplifiers and loading coils:

1. Form factor - ratio of Length: Diameter should be in the range of about 0.5:1, to 4:1.
2. Q increases roughly in proportion to the square root of coil diameter - where wire diameter must increase in proportion to coil diameter.

Accordingly...

3. Use a wire that is somewhat smaller than the space available such that distance between turns is about 0.5, to 1.5 wire diameter.
4. Employ the minimum of dielectric material in, and near the coil's field.
5. The coil should be situated as far as practicable from other metal objects.

Item 2 needs some clarification. There is no harm in aiming for the highest practicable Q. In most applications, however, there will be a point of "diminishing returns", where system losses mask any improvement above a

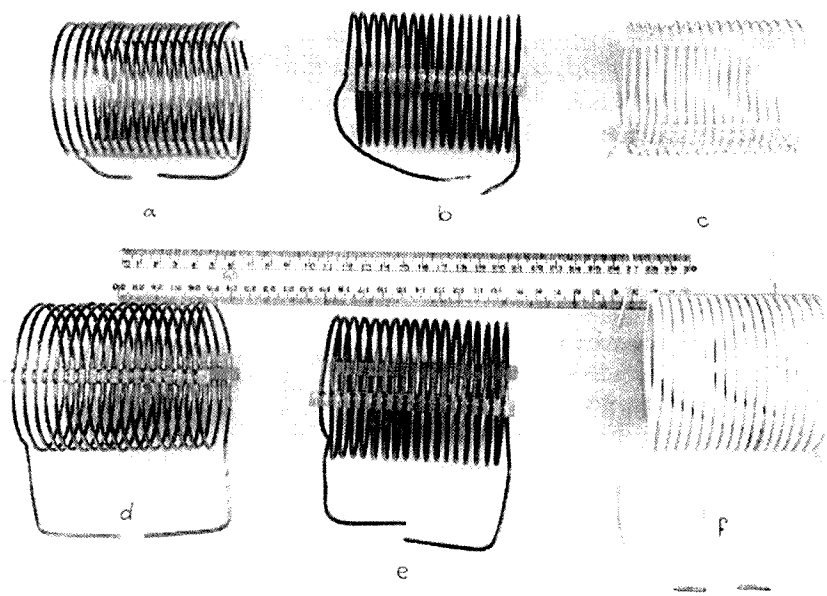


Photo 1 - Test coils a ~ f.

certain value of Q (Reference 3).

One may question why dielectric material (which influences capacitance) has anything to do with inductance. We must remember, however, that real-world coils have unavoidable (but often reducible) parasitic or "stray" capacitances between turns, and also from those turns to nearby objects, hence they become part of the capacitive arm of the circuit. So, all dielectric matter, including the former and any insulation upon the coil's wire, should therefore be minimal and composed of suitably low-loss material.

The question of what surface coating is best for radio coils was addressed in a classic paper by Alan Fowler (Reference 6). To satisfy my own curiosity as to what effect (if any) the coating or dielectric material on the wire may have upon the Q of a typical coil, six solenoids were made using 2 mm diameter soft copper wire, winding pitch 5 mm, 9 cm length, 7 cm diameter, fabricated in accordance with details provided in a recent article (Reference 7). The following surfaces were tested and results obtained:

Test Frequency	1 kHz		3.6 MHz	
	L µH	Q	L µH	Q
a. Plain bright copper (Cu)	12.5	3.1	12.8	350
b. Enamelled Cu.	12.8	3.0	12.8	340
c. Silver-plated Cu (0.025 mm depth)	12.5	3.1	12.8	350
d. Tinned Cu.	13.2	3.1	13.3	340
e. Oxidized Cu.	12.5	3.1	12.8	330
f. Insulated stranded electrical wire.	14.0	2.6	13.9	240

At a test frequency of 7.2 MHz, Qs were generally about 100 less than those shown for 3.6 MHz, except for the plain Cu coil, which yielded 270. Interestingly, the measured Q at 1 kHz agrees very well with the dc resistance of the coil. Re-arranging the above formula for R = XL/Q, where XL at 1 kHz = 0.082 ohm, 0.082/3 = 0.027 ohm. Measured dc resistance is typically 0.021 ohm.

Skin depth in mm may be calculated (Reference 1, p34, Ref. 8, p14.57):

$$dmm = 66.2/\sqrt{f}$$

where f is in Hz. At 3.6 MHz skin depth is about .035 mm, and at 7.2 MHz it is about .025 mm. The silver-plating thickness is also .025 mm, yet it appears that the Q of my test coil is not measurably improved.

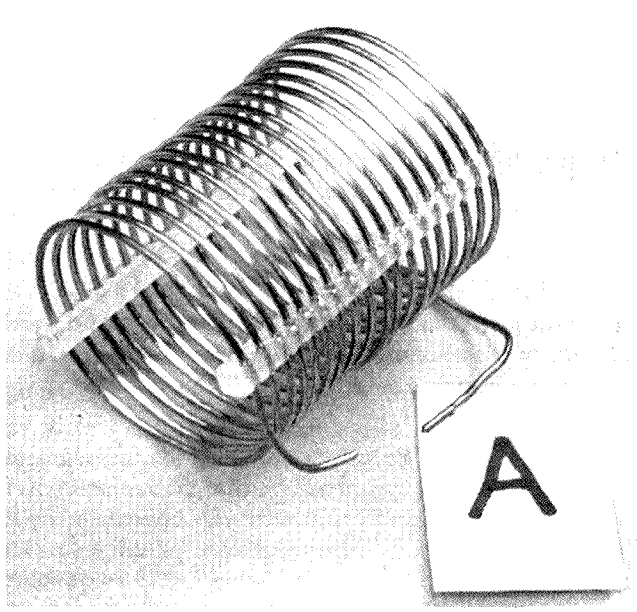


Photo 2 - Plain bright copper wire coil 'A' has a Q of 350 at 3.6 MHz.

Conclusion

Plain bright copper and pure silver-plated copper achieved the same Q value at 3.6 MHz, all other factors being substantially equal. Enamelled and tinned scored a slightly lower figure. Oxidized copper was slightly lower again. For solenoid coils at HF, therefore, there appears to be no benefit in silver-plating the wire. Indeed, silver-plating may actually yield a lower Q than for plain bright copper.

The effect of an enamel coating on the wire is not as bad as has sometimes been suggested, which is good news because many of our coils (eg baluns and toroids) must perforce use enamelled wire. Tinned copper scored similarly. The effect of a greenish oxide coating does appear to lower the Q marginally, but not so much as to cause us to be greatly worried about all those tarnished coils in older equipment.

A (perhaps surprisingly) notable disappointment is the coil made from ordinary stranded insulated electrical wire, which may be adequate in an emergency, or where no other wire is available, but it certainly should be avoided where best efficiency is required.

References and further reading

1. *Radio Engineers' Handbook*; F Terman, 1943.
2. *Radio(tron) Designer's Handbook*; F Langford-Smith. 4th edition RCA/AWA, chap 10 and 11 (available as a re-print).
3. "Loading Inductors"; www.w8ji.com (excellent).
4. *The ARRL Handbook for Radio Amateurs*; see chap 10 in any recent edition.
5. *Foundations of Wireless and Electronics*; M Scroggie. Newnes Technical.
6. "RF Performance of Electroplated Conductors"; A Fowler, Electronics Australia, July 1970, pp 69 - 71.
7. "Another Method of Making 'air-wound' Transmitting Coils"; Diamond, *Amateur Radio* Volume 73 No3 page 10
8. *Radio Communication Handbook*, RSGB, 7th edition.

ar

Beyond our shores

David A. Pilley VK2AYD
davpil@midcoast.com.au

Philippines:

Hams may lose 70 cm

Hams in the Philippines are wondering how long it will be before they are ordered off the 70 centimetre band. This, after that nation's National Telecommunications Commission announces the inclusion of all of that band in spectrum it is considering being made available for broadband wireless networks.

The regulatory agency made the suggestion in a memorandum titled "Frequency Band Allocations for Broadband Wireless Access." The surprise was the inclusion of 410 to 495MHz in nine bands. This includes the Amateur and Amateur Satellite spectrum including the internationally agreed to allocations.

The Philippines National Telecommunications Council says it proposes to reallocate spectrum for broadband wireless networks in line with the thrust of the government to promote and facilitate the development of information and communications technology. Right now only about 5% of the population in The Philippines has access to the Internet, much less broadband, and this is partly due to the lack of infrastructure.

(ARNewsline)

Space:

STS-14 features a 6 ham crew

Amateur radio operators make up 6 of the 7 crew members of the STS-114 Space Shuttle mission crew. They are Mission Commander Eileen Collins, KD5EDS; Mission Specialist Wendy Lawrence, KC5KII; Mission Specialist Charles Camarda, KC5ZSY; Mission Specialist Soichi Noguchi, KD5TVP; Mission Specialist - Andrew Thomas, KD5CHF and Pilot James Kelly, KC5ZSW.

Also carried on the STS 114 mission is the PC SAT2 ham radio satellite. It will not become operational until it has been mounted on the I-S-S. A spacewalk to do this was scheduled to take place shortly. A presentation on PCSAT2 was be held at the AMSAT-UK International Space Colloquium in Guildford, England from July 29th to the 31st.

(M5AKA, AMSAT-UK)

Global:

Log Book Of The World

The ARRL's *Logbook of the World* (LoTW) now has surpassed 10,000 registered users worldwide!

LoTW, which went on line September 15, 2003, provides a global repository of participants' logs. When both participants in a QSO submit matching QSO records to LoTW, the result is a "QSL credit" that can be eventually applied toward many awards.

To date, more than 75.1 million QSO records have been entered into the system, resulting in nearly 3.5 million QSL records or matches among uploaded logs. At present ARRL LoTW QSO credits are applicable only toward DXCC, but plans call for supporting other awards, such as WAS and VUCC, in the future.

To ensure system integrity, LoTW users first must obtain a free digital certificate, used when submitting log data to the database. Users incur a fee only when they apply QSL matches from LoTW toward a particular award. The specific fee varies depending on the number of credits purchased at one time.

The LoTW Web page http://www.arrl.org/lotw has complete information on how to register and use the system.

(ARRK)

U.S.A.

FCC proposes dropping Morse Code requirement

The FCC has proposed dropping the 5 WPM Morse code element as a requirement to obtain an Amateur Radio licence of any class. The Commission included the provision in a July 19 Notice of Proposed Rule Making and Order (NPRM&O) in WT Docket 05-235, but it declined to go along with any other proposed changes to Amateur Service licensing rules or operating privileges. Dropping the Morse code requirement or any other changes to Part 97 would not become final until the Commission gathers additional public comments, formally adopts any new rules and concludes the proceeding with a Report and Order specifying the changes and an effective date. That's not likely to happen for several months.

The FCC received some 6,200 comments to their petition. The Commission said it believes dropping the 5 WPM Morse examination would encourage more people to become amateur radio operators, and would eliminate a requirement that's "now unnecessary" and may discourage current licensees from advancing their skills. It said the change would "promote more efficient use" of amateur spectrum.

To support dropping the code requirement, the FCC cited changes in Article 25 of the international Radio Regulations adopted at World Radiocommunication Conference 2003. WRC-03 deleted the Morse testing requirement for amateur applicants seeking HF privileges and left it up to each country to determine whether or not they mandate Morse testing. Several countries already have dropped their Morse requirements for HF access.

The ARRL had suggested a new Entry-Level licence. However the FCC said it did not believe a new entry-level licence class was warranted because current Novice and Tech Plus licensees will easily be able to upgrade to General once the code requirement goes away.

(ARRL Newsletter)

Canada:

drops Morse requirement

Industry Canada (IC) has adopted elements of the Radio Amateurs of Canada (RAC) "Proposal on Morse Code and Related Matters" and has essentially removed the requirement for Amateur Radio applicants in that country to obtain a "Morse Qualification" for access to bands below 30 MHz.

"Morse code will no longer be the sole additional requirement by which Canadian radio amateurs will gain access to the HF bands, but it will remain as one valid criterion," Industry Canada said in its Notice announcing the regulatory change. Industry Canada said it will continue to include Morse code as a consideration in granting access to the HF bands. "However, this is only one criterion and the measure of HF operator abilities should not be limited to this one facet of operator skills," IC added.

(ARRL News)

ar

ALARA

Christine Taylor VK5CTY

ALARA's 30th Birthday

Unfortunately due to a number of conflicting engagements there were very few YLs on for the Birthday Net on 23rd. However, I understand that the few did have a good chat. I also understand that a couple of OMs joined in later to swell the ranks.

For the 30th Birthday Luncheon on 31st July the story in VK5 was very different. There were 14 YLs and 6 OMs at the Marion Hotel. The food was good but the friendship was even better. We are fortunate in VK5 to have kept contact with our members through our monthly lunches and because a number of us are members of the same radio club.

The photo shows two of the earliest members of ALARA cutting the cake with flags and chocolate recognising the important milestone for ALARA.

Myrna VK5YW tells me that Lorraine, VK5LM, joined ALARA before she did but Myrna is remembered as the controller for the very first ALARA Net. Even though the log of that Net (and the subsequent ones) show that there were as many OMs as there were YLs, the OMs were there to allow their YLs to be on the air. So many of us have started just that way.

The Newsletter produced by Dot VK2DB was especially colourful and interesting, also in recognition of the important birthday. The birthday year will be completed with the ALARAMEET in Mildura.

We can be said to have celebrated our birthday in style

Two of the earliest members of ALARA cutting the cake in VK5

ALARAMEET news

Bookings have been confirmed for nearly 50 and the plans are all in place. The weather is booked to be beautiful and the company will certainly be great. The weekend of September 9th to 12th will be one to remember. There will be a number of ZL members and at least two DX members from further away. It all sounds very exciting.

I hope you didn't forget the contest

By the time you read this, the ALARA Contest will be over and decided. I hope you were there. Maybe you were also active in the Remembrance Day Contest, too. That is an excellent way to make sure your rig is in order and ready for the ALARA Contest. If you forgot this year, remember next year, please.

VK5 YLs celebrating ALARA's 30th birthday

Speaking of making sure your rig is working...

After being disconnected and packed away for nine weeks I left it to my son (a computer buff rather than a radio buff, but still good at connecting units together) to re-assemble my rig. He did a great job. I could hear everyone very well.

I only listened for a couple of weeks but decided to join in on the third week. I pushed the button on the desk mike. The receiver went quiet, but no one heard me!! I tried several times with no more success. I even tried a couple of other mikes, but nothing worked.

So I rang the home QTH of one of the YLs on air and explained the situation... At least they knew I was there and could hear them all.

During the week I again tried to get it all to speak as well as to hear but eventually had to ask for help.

After much testing and undoing of plugs – rather fearful that wires could be broken before their connections had been identified, my rescuer discovered that one of the connections could be and had been plugged in 180° out of phase.

On very close inspection there were two almost invisible white dots to indicate the right way up, but there was absolutely no locating mark on the plugs at all.

There are now large, very visible white marks on the matching plug and socket.

Spreading the publicity in VK2

Recently Dot VK2DB again ran a stall at the Gosford Field Day which was the focus for YLs all day. Dot has been showing the flag for ALARA at Gosford for over ten years. A number of YLs have been inspired to sit for their exams and ALARA has gained quite a few members through our exposure at Gosford.

Is there a HAMFEST or Meet in your area at which you could encourage other YLs to join our select band? Pat VK3OZ has encouraged several very young

Spotlight on SWLing

Robin Harwood VK7RH

Signals are slowly being heard in our local evening hours after being dead over the winter months. The sunspot numbers are also slowly climbing back up again but there are still extensive fadeouts disrupting HF propagation. I have also noted daytime propagation particularly from China seems to be increasing. A relay on 13610 of one of the domestic networks seems to be almost around the clock. The firedrake jamming seems to have been replaced by relays of domestic networks.

Remember the long time Israeli Defence Station 4XZ? It used to be heard on a variety of channels with a CW marker and was a pretty reliable indicator for mid-eastern propagation. This was especially true for the 30 metres allocation as it used to be on 10046. You may be wondering where it has gone. I believe CW was replaced by the use of a sophisticated digital technology. I believe it has already been observed here in Australia on 8780 and surprisingly on 7160, on USB. I am certain that it will appear on other channels.

In last month's magazine there was an excellent article and background of the new DRM technology by John L Cartmill, VK4BJ. Here is the latest from John.:

"I am still receiving DRM most evenings from DW from Trincomallee on 21.675 and it is the most reliable at 0700 UTC

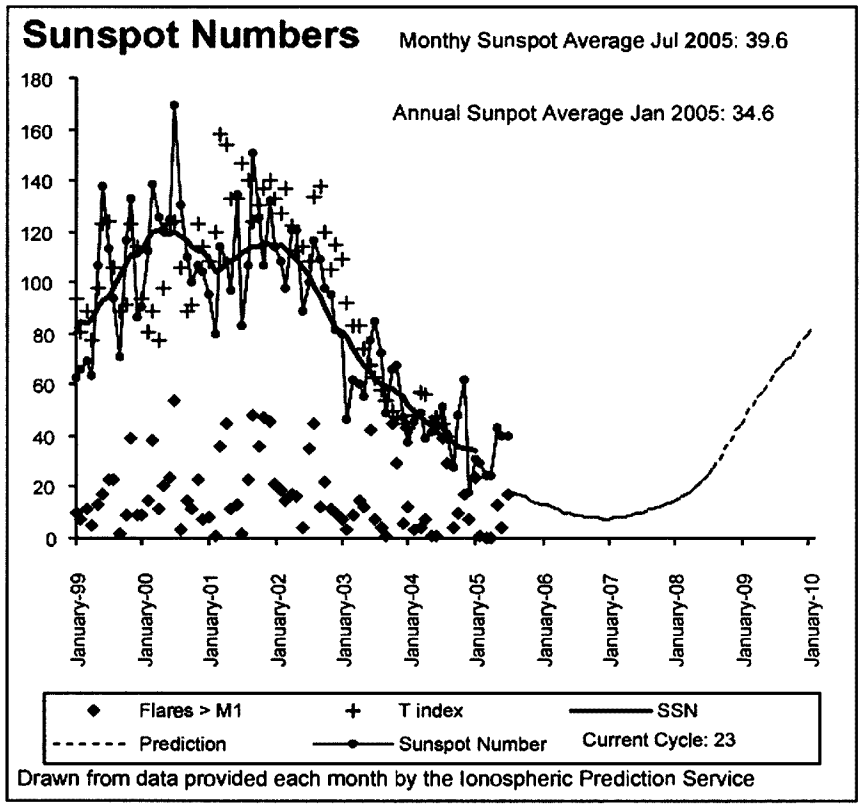
"Of interest as well is the DW signal on 7265 which I am able to 'see' most afternoons at 0600 UTC. The other evening I resolved sound with very few dropouts for the better part of an hour. Quality was excellent and the absence of any background noise made it a pleasure to listen to. This signal also carries a fair size test service including schedules and news items. I was able to resolve much of this as well. Later in the evening, around 1100 or 1200 UTC it is often possible to hear Kuwait on 13620. This is in Arabic. Last night at 1630 UTC, I heard DW on 13790 at low dropout. Between 18 to 20 hours UTC DRM signals from Europe may be observed."

As I have previously mentioned, I recently invested in broadband and I have been extensively downloading international stations including several rarely heard on shortwave. Naturally it isn't the same but still worthwhile. I also discovered several applications on my computer had hidden spyware especially on one well-known instant messenger program. It was secretly recording every keystroke and mouse movement I was making. This information was being sent back to Washington State. I quickly removed it once my firewall determined what was going on. I expect that the user may or may not have been made aware in the fine print in the "I accept" message that this was there. The moral is many so-called free programs may have hidden spyware applications lurking on your computer, so it is recommended that you keep your anti-spyware programs regularly updated.

Well that is all for September and good monitoring!

73 from VK7RH

ar



ALARA *continued*

ladies to sit for and pass their exams recently. It is great to know that we can attract the very young as well as the not so young.

After all what other organisation is there in which you will be a Young Lady all your life?

WWW special interest group for YLs

A new YL-IRLP NET has begun in Australia, running from 7.00am EST on the 1st and 3rd Sundays of each month. They are keen to attract all YLs but especially the younger ones (though OMs are allowed to join in, too) so if you are awake at 7.00am on a Sunday, tune in to IRLP Reflector 9258 and have fun.

This group apparently has grown out of a packet YL group about which some of you may have known before.

The Net control will be shared between Ann ZL3TNT and John KC8FRW which shows an international flavour.

You can get more information by email to Shirley VK7HSC on shirmax@southcom.com.au.

ar

News from...

VK2

Tim Mills VK2ZTM.

The 6 metre VK2RSY beacon was restored late July with a temporary transmitter on the new frequency of 50.289 MHz. Mode is CW, power 12 watts to a wire dipole, about 5 metre above ground with the main lobe north and south. A permanent dedicated transmitter is to be constructed. Later in the Dural upgrade there will be an omnidirectional horizontal antenna on a more elevated support. The 70 cm beacon has seen better days, all the RF stages expired. It will be off for a while until an alternate system is constructed.

Likewise, the 2 metre system requires a new transmitter. All the VHF / UHF VK2RSY beacons, which operate from the VK2WI site, will be converted to the CW mode in place of the previous FSK mode.

The Morse transmission, currently only on 80 metres - 3699 kHz - has been fitted with a new solid state keying system. The previous system used a rather old computer reading a floppy disk. Les VK2KYJ designed, constructed and donated a solid state keyer. Thanks from AR-NSW to Les for his efforts.

There has been a change in the format of the Sunday morning VK2WI news session where the VK1WIA segment is now at 10 am, followed by VK2WI news at 1030 am. There are plans to introduce segments of the Q5 technical lectures. Times and operation frequencies are yet to be determined.

Major items of equipment from Deceased Estates will be made available to AR-NSW members by tender. This is expected to be in place by the September Trash and Treasure, on Sunday the 25th. The VK2WI news sessions will advise. The September date is also the weekend when the first of the training in the new accreditation is being undertaken. On the Sunday, both the T&T and the Home Brew meeting will be confined to the Parramatta car park. The Home Brew meeting will be a demonstration on workshop practice and safety.

It is planned to hold a meeting of VK2 clubs in conjunction with the National WIA on a tentative date of Saturday the 12th November at Amateur Radio House.

Silent key

Fred Herron VK2BHE

It is with great regret we advise the passing of Fred Herron VK2BHE, of Lismore.

Fred passed away at home on 2 August 2005, aged 79.

Fred was born on 12 February, 1926 at Kurri Kurri, NSW.

Because of financial difficulties Fred left High school at 15, Intermediate Certificate.

He got a job in the Justice Dept. as a depositions clerk. He joined the Air Force in 1944 to train as a pilot. The war ended before he saw active service.

Returning to the Justice Dept. he commenced studying to become a Solicitor. In 1949 he married and moved to Ballina as Clerk of Petty Sessions. He left the Dept in 1959, joining a local legal firm. He qualified as a Solicitor in 1961.

Continued interest in flying saw him get his Private, then Commercial Pilots License.

He got his Instructors rating, then became the Hon. Flight Instructor for the Northern Rivers Aero Club.

He taught several SARC members flying to get their Private Pilots Licence. He also took up Amateur Radio, joining the Summerland Amateur Radio Club. He wrote the Club's new Constitution in about 1975 and also assisted drafting the VK2 WIA Constitution at the same time. He was the first WICEN Coordinator for the Northern Rivers Region. He was the advisor and Hon Solicitor for SARC until about 1986 when his changing duties made it not possible for him to continue. He was on the Committee and President of SARC during this period. In 1984 he became President of the Law Society of NSW and travelled worldwide on its behalf.

Fred introduced many novel computerised methods into legal practices.

In 1986 he was appointed a Local Court Arbitrator covering from Casino to Tweed Heads.

He was very successful and popular with all these positions and accomplishments.

He kept up his membership and interest in SARC and WICEN to the end although failing health prevented him from being active to any extent.

His funeral was held in St Andrews Anglican Church, Lismore on Friday, 5th August.

There was an overflowing congregation including members of SARC who knew him.

Fred VK2BHE was a respected and highly thought of member by all those who knew him and will be missed.

Condolences and best wishes to his family and friends from all in SARC and Amateur Radio.

Vale Fred VK2BHE.

I personally knew Fred from about 1975 onwards. A great man.

John Alcorn, VK2JWA, SARC14
Treasurer, SARC.

VK7

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

Congratulations

This month to Vince, VK7VH and Ray, VK7NRS for coming equal first in the 160m Trans-Tasman competition. Vince and Ray operated the VK7CHT Central Highlands club callsign from a vineyard retreat on Bruny Island. Happy birthday to John, VK7JK for reaching 82 years young! John is still reading the VK7 Regional News broadcasts once a month, collecting our call-back statistics in the South and manages to find time to homebrew at the REAST gatherings on a Wednesday afternoon.

BPL trial in VK7 update

Many boxes and associated equipment are appearing on poles around Hobart and two locations have been announced - the Newtown and Mt Nelson postcode areas. The measurement team has taken background noise level readings and is awaiting the start of the trial. The latest start date was late August. Watch this space!

Central Highlands Amateur Radio Club of Tasmania

The 80 m dash for the Wadda Cup Contest is being held on Saturday the 24 September, starting at 8.00pm and finishing at 9.00pm EST. Check out the club website, cht.net for rules or the rules article in the July edition of AR Mag. This is a great, quick contest and I encourage you all to participate, it was great fun last year! The club's winter getaway weekend was held at Tiger Hut, Liaweene, over July 22-24. From all reports it was a great weekend with plenty of eyeball rag-chewing.

North West Tasmania Amateur Radio Interest Group

NWTARIG held a general meeting on Saturday July 30 at the Ulverstone Lions Club. There was quantity of estate amateur radio equipment for sale. Packet is back on the air in the NW with the return of Jim VK7JH's digi on 147.600. APRS is also making an appearance with Tony, VK7AX running the APRS Ul-View web service showing position information and maps of VK and ZL APRS stations.

Northern Tasmanian Amateur Radio Club

Reports from Wednesday July 13's NTARC meeting was that it was a hoot! Phil, VK7JJ did a great presentation on using the antenna design software (MMANA). Almost 30 members and visitors from far and wide attended. Phil left us all itching to race home and get on the internet and download the software. Thanks Phil. JOTA is just around the corner so let Tony VK7YBG know via 7RAA if you are available. This is a great opportunity to give young people a really positive experience of AR.

Radio and Electronics Association of Southern Tasmania Inc.

The first REAST Computer Users Group meeting took place at the domain clubrooms on Friday July 29. Around 12 people visited us during the evening and several operating systems were played with. There were demonstrations of Linux, a router was fixed and much discussion was had about things digital. This group intends to meet each Friday night and cover anything with a computer in it! Thanks to Ken, VK7KRJ and his group of enthusiastic helpers, the clubrooms now have a CATV computer network, some PCs to play with and I understand WLAN is being considered, ahhh, some 2.4 GHz radio!

August 3 saw Martin VK7GN and yours truly present a session on BPL – Up Close and Personal. We covered the basics, types, frequencies, typical systems, what it sounds like and looks like, economics, politics and some detailed photos of the equipment that is appearing around Hobart. Martin,VK7GN then gave a demonstration of the Field Strength Measurement FSM software that was developed by Owen Duffy, VK1OD.

VK5

Radio Amateurs Old Timers Club of SA

The annual Luncheon will be held on Thursday 27th October 2005 at noon for 12.30 at the Marion Hotel, Marion Road, Mitchell Park.

Public transport:- Bus 243 from the city, alight at stop 24.

Do not forget your Seniors Card!

RSVP by 22/10/05 to
Ray Deane VK5RK
Phone 8271 5401
or Ron Coat VK5RV,
Phone 8296 6681.

Silent key

Jack Townsend VK5HT

Jack Townsend VK5HT died on 21st July 2005 after a long illness. He was 85.

Jack became a Ham in 1939 and joined the army in 1940. Later in June 1941 he transferred to the RAAF. He served in Darwin.

He was President of the RAAF Signals and Radar Club in South Australia and the Old Timers Association, South Australia. His other interests included the South Australian Yacht Club and the Beef Steak and Burgundy club, of which he was Wine Master for 8 years.

He leaves a wife Joan and 2 sons Ian and Graham and 4 grandchildren.

73 Jack.

Ray Deane VK5RK

ar

AMSAT

Bill Magnusson VK3JT

PCsat2 mounted during spacewalk

The flight of the Space Shuttle came to a successful conclusion on 9th August after a few anxious moments. It also marked the successful installation of PCsat2 on the ISS during one of the space walks by crew members. Many amateurs watched this on real time video as a result of the huge publicity machine that swung into action for the shuttle flight. PCsat2 is being commissioned as I write this and by next month it should have passed all tests and be put into full operation mode. Hearty congratulations to Bob Bruninga and his Midshipmen at the US Naval Academy. Keep an eye on the usual sources for up to date information as the scene is changing daily.

Another amateur radio satellite springs back to life

Launched way back in 1984, UO-11 was one of our longest living and most trouble-free satellites ever. It started to experience a few problems a couple of years ago when the 2.4 GHz beacon dropped to half power but all other functions continued as normal. The battery started showing signs of age a year or so ago and eventually UO-11 was only reliable when not in eclipse. In its early years UO-11 never experienced any eclipses. It was launched into a sun-synchronous orbit. But of course UO-11 didn't carry any propellant so it could not be maintained in this orbit and gradually drifted. For many years the batteries held their voltage right through any eclipses but this could not be expected to last. A few months ago UO-11 went silent during an eclipse period and it was thought that it had expired completely. Much was subsequently written about the loss of this iconic satellite. During its long life it had achieved a number of 'firsts'. It had been used in its early days to demonstrate the viability of digital store and forward communications. Ground breaking in its day. Its microwave beacon was used extensively as a test signal for receivers and pre-amps around the globe by those amateurs setting up for mode-S. A few weeks ago Clive Wallis G3CWV asked operators to look for the beacon again as it had been reported to him that someone thought they might have heard it. Soon the reports started coming in. UO-11 was back on-air, transmitting its 2 m signal a little weaker than normal and with some of the telemetry channels not operating but nonetheless "back in business". Just for old time's sake have a listen for UO-11. In the early days you needed a special demodulator and decoder but now we have software like MixW to make sense of the beacon telemetry. It will be interesting to see how long this old timer lasts and whether it can survive its next eclipse period in a few months.

PO-28 returns to the Amateur Radio Service

It was announced at the AMSAT-UK International Space Colloquium in Guildford, England by the AMSAT-UK secretary Jim Heck G3WGM that Amateurs will be getting a new satellite to use. PO-28 (POSAT-1) was launched on September 25th 1993. Its primary purpose was for commercial use on frequencies outside the Amateur bands but it also had the capability to operate on the Amateur bands. After prolonged negotiations it has been agreed that the satellite can be switched permanently to the Amateur frequencies. PO-28 (POSAT-1) was built at the University of Surrey within a collaborative program in satellite technology between a consortium of Portuguese academia and industry and the University of Surrey, managed through Surrey Satellite Technology Ltd. Here are some details:

Uplink Frequencies: 145.925 and 145.975 MHz

Downlink Frequencies: 435.075 and 435.275 MHz

Orbit : 822 x 800 km, 98.6 deg inclined, sun-synchronous.

The above news was posted to the AMSAT-BB by Trevor M5AKA towards the end of July. Since that time much discussion has taken place regarding the formats and modes of operation which would be used when the change over from commercial to amateur operation takes place. Keep an eye on the BB and on the AMSAT-NA web site for breaking news on this subject.

The AMSAT group in Australia.

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net.

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

SSETI Express launch date confirmed

Graham G3VZV advises that the revised launch date for SSETI Express and the other satellites on the DMC3 COSMOS launch has been confirmed as September 27th - so please keep those fingers crossed! Look at the AMSAT-UK or SSETI web sites for the latest information

More on CC Rider

The Future of Amateur Radio Satellite Transponders

AMSAT President Rick W2GPS posted the following information in answer to a question on the BB.

The Eagle C-C Rider payload is intended to be a combination of four great ideas in one project.

1. W3IWI's original C-C-Rider 5 GHz in-band transponder.
2. N4HY's Software Defined Transponder (SDT) concepts.
3. KA9Q's KarnSat digital backbone (~1Mbps).
4. WA4SIR's "IP in Space" concept.

Geoffrey (Geoff) Murray Taylor VK5TY

ETSA Technical Officer & Amateur Radio Godfather

Born: Adelaide, 18th July 1929

Died: in UK 21st June 2005

His grandfather was an Overland Telegraph Operator, his father a sheep station manager, who climbed tall towers to repair windmills. This might explain why Geoff had a lifelong affaire with climbing towers and radio communications.

Geoff lived in the same house for over 70 years, where he went to Black Forest Primary School, and graduated to the prestigious Adelaide Technical High School on North Terrace. He was accepted as a University Cadet by the Adelaide Electric Supply Company (later the Electricity Trust of South Australia, ETSA) where he worked as a Technical Officer almost 40 years until he retired early twenty years ago. At one time he was responsible for setting out powerlines along Adelaide's Marion Road with military precision. In later life he could not drive down from O'Halloran Hill towards the City at night without complaining about the "kink" in the streetlight line where the "new" railway bridge crossing Marion Road spoiled the effect.

Geoff rose to a senior position in ETSA's Test & Standards Laboratory. His official duties included apprentice training, developing his latent teaching skills, which later were to help several hundred aspiring radio amateurs (hams) qualify for their licences.

In 1959 Geoff was infected with the Amateur Radio bug and after passing his exams gained his call sign VK5ZCQ, and later passed his Morse code and upgraded to VK5TY. In 1972 he set up an amateur radio station in the Black Forest Scout Hall, and in 1973 he started the Black Forest Scout Radio Group, where his teaching prowess helped many youngsters build electrical projects and obtain their Amateur licences. He was still running highly successful classes, with students aged from 13 to 80+, thirty-five years later

Amateur radio has figured highly with Geoff being President of the State Division of the Wireless Institute of Australia from April 1972 to 1974. During this period he chaired some torrid meetings at the Master Builders' Building on South Terrace. He successfully co-opted many amateurs to renovate the Burley Griffen Incinerator at Thebarton & change it into a unique headquarters for the local Division. He represented South Australia for 13 years as a Federal Councillor and later became President of the Adelaide Hills Amateur Radio Society (AHARS), a position he held to his death, during which time he was Commissioner for Scout Radio in SA for 6 years.

Geoff was Unley Councils 2003 Citizen of the Year in recognition of services to Scouting and Amateur Radio.

In his "retirement" Geoff and his wife Christine, bought a scrub block near Swan Reach, "to get away from the phone". They personally built a two story "home from home" Wombaroo in several stages over several years. It was an electronic marvel, powered by solar collectors, a windmill and occasionally a generator. Later they compromised their ideals and acquired a mobile phone!! It has played host to many Amateur Radio field days, outdoor film nights showing rarer old 16mm movies and hosted many visitors from home and overseas. Until recently Geoff and Christine provided a first class public address service at local events in partnership with another ex ETSA man, and could not keep up with the demand.

In March Geoff and Christine went to the UK for their long planned holiday of a lifetime, where they fulfilled dreams such as travelling through the Channel Tunnel. With the holiday almost completed Geoff unexpectedly passed away on the 21st June.

He is survived by Christine and their children Murray, Marian, Heather and Greta and nine grandchildren.

"Live as if you were to die tomorrow.
Learn as if you were to live forever."

–Mahatma Gandhi

Submitted by
Rufus VK5YO and Sandra Salaman.

AMSAT continued

The concept for this came together in a pair of "Dream Payload" meetings held in my Lab in February and May of 2004. Each of the four parts builds on the previous parts and should result in a communications mode that simultaneously allows users to operate voice, data, video, and other modes while minimising the need to track Doppler, even if fielded on a low orbit satellite. The user will only need a small antenna with single band feed, which could allow users in restricted communities to disguise the antenna as a TVRO. The low level protocols, including multi-user uplink access protocols, have not been designed yet. We are still working on the design for the RF and the electronically steered beam antenna for the satellite. The modulation will probably be BPSK. The downlink will probably be on the order of 500 kbps data rate. Uplinks will probably be about 10 kbps (effective) per channel. A lot depends on the evaluation of link budgets. If we reach this goal, the lower protocol layers will present an Application Programming Interface (API) at the IP level so any applications that are available for the Internet should work on the satellite. That includes things like EchoLink (voice), FTP, Web page servers, etc. The AMSAT community will be able to participate in the development and operation of this new concept in communications as the design will be "open source" under a GNU or GNU-like license. This includes both hardware and software. We do not expect to achieve all our goals in the first transponder implementation but we will implement the core elements of this vision. Ultimately we hope to introduce a whole new concept in open accessible satellite communications that will revolutionise the Amateur Satellite Experience.

ar

Technical abstracts

Peter Gibson VK3AZL

A portable inverted V antenna

In QST for June 2005, Joseph Littlepage, WE5Y describes his solution to a number of common antenna problems of today.

While it may be useful for field days, this antenna was built to solve the problems raised by moving to a neighbourhood where erection of an conventional antenna is not acceptable.

After trying a range of end-fed wires and hard-to-support dipoles, it was decided to try an inverted V, cut for 17 metres. While 17 metres is used here, any band from 20 to 10 metres can use this construction technique. The big problem was how to support the antenna in a manner that was acceptable. The final solution was to use a lightweight pushup pole, supported by a folding tripod base. The final arrangement is shown in Figure 1. In this case, the telescopic mast is a 10 metre unit from MFJ (MFJ-1910) and the support is also from MFJ (MFJ-1918) although is should be possible to source or construct suitable items locally.

The top of the antenna should bring together the feedline and the two wire elements while keeping the angle between them at least 90 degrees. Each of the wire elements is cut for ¼ wavelength on each side. The length of the horizontal supports has to be such as to hold the elements at the correct angle. An additional requirement was to be able to rotate the antenna to maximize the signal, using the 'armstrong' method.

The solution to the horizontal support problem was to use two 3 metre light weight telescoping fiberglass fishing rods, held end to end, either side of the vertical pole. The support for the fishing poles is made of two 12 inch lengths of ½ inch PVC pipe, joined to a ¾ inch PVC

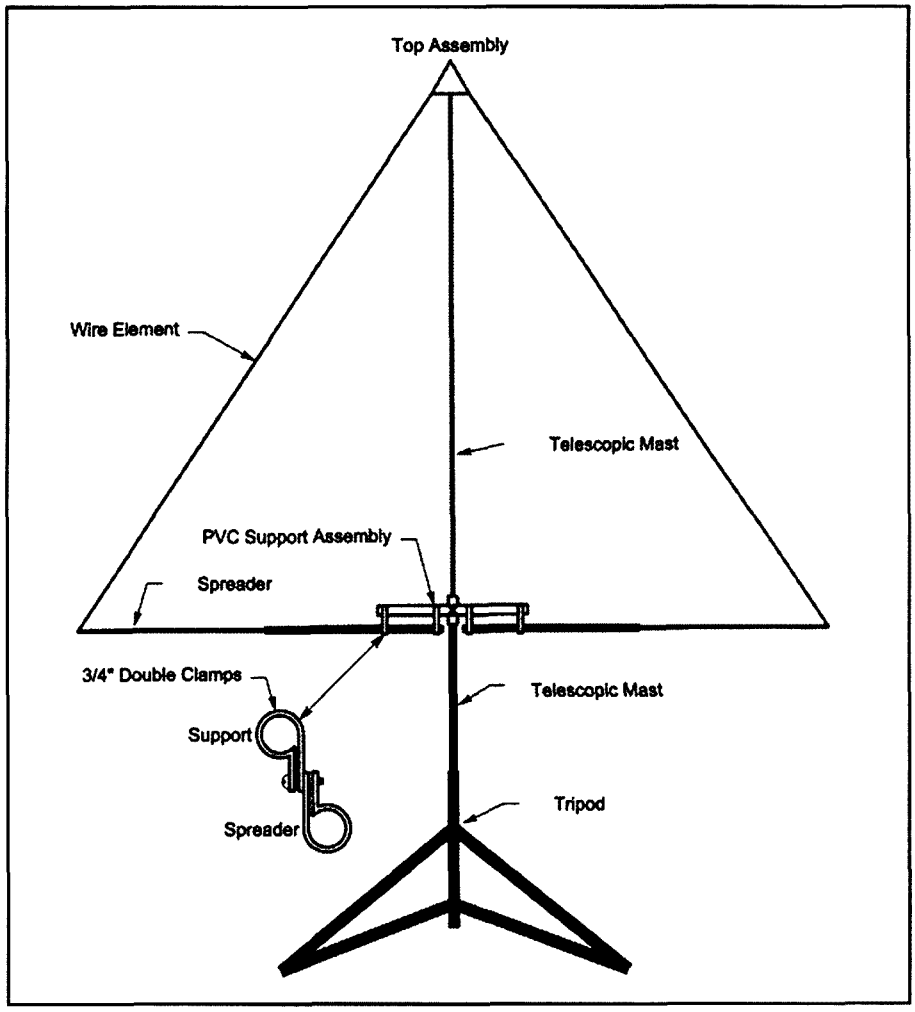


Fig 1. General arrangement of the completed inverted V antenna

'X' connector. This holds the spreaders in a horizontal position and enables them to ride up and down on the main support mast to keep tension on the elements. The horizontal assembly is shown in Figure 3. The free ends of the wire elements are attached to the eyelets on the ends of the two spreader poles.

The top assembly is required to bring the wire elements and the transmission line together as well as supporting them at the top of the mast. This assembly is constructed from 1/8 inch (or thicker) clear acrylic or similar dielectric material. Its precise dimensions are not critical. Drill holes to accommodate a top hanger, two solder lugs, a nylon cable clamp and a hole in each lower corner to support the antenna wires. Figure 2 shows the layout and relationship of all components. Neither the construction method, nor the dimensions are critical.

The spreader support assembly is made from a ¾ inch PVC X connector with ¾ to ½ inch bushings pressed into opposite side holes. The two 12 inch long support arms are pressed into the bushings. Cement all joints with PVC cement. The two remaining holes will allow the spreader to ride up and down the vertical mast. To ensure this happens, the slight raised lip inside these holes should be filed down flush with the inside surface. The two telescoping fishing poles are clamped to the 12 inch pipes as shown in figure 3.

When all of the components have been assembled it is time to string the elements. Firstly, thread the horizontal spreader down the telescoping mast. With the elements and transmission line connected to the top assembly, hook it into the top of the telescopic mast with a hook made of stiff wire (coat hanger), extending down into the tube. Then extend the mast sections, clamping them as you go until the element wires are pulled taut by the weight of the spreader. Extend the additional sections to raise the antenna as high as possible. The antenna is now ready for testing by any of the normal methods.

Note. 1 inch equals 25.4 mm

ar

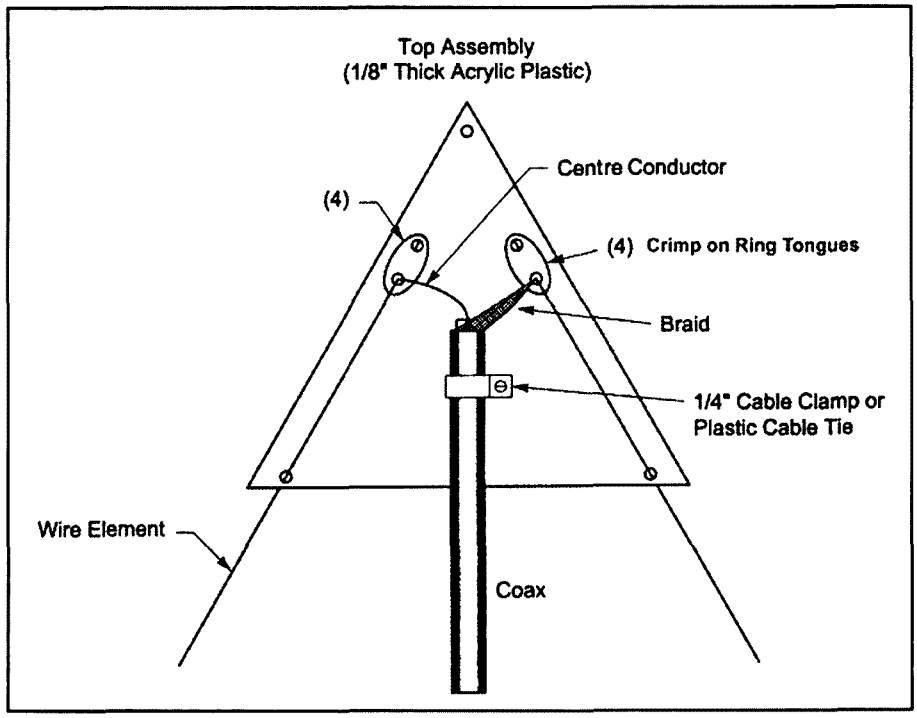


Fig 2. Details of the top assembly

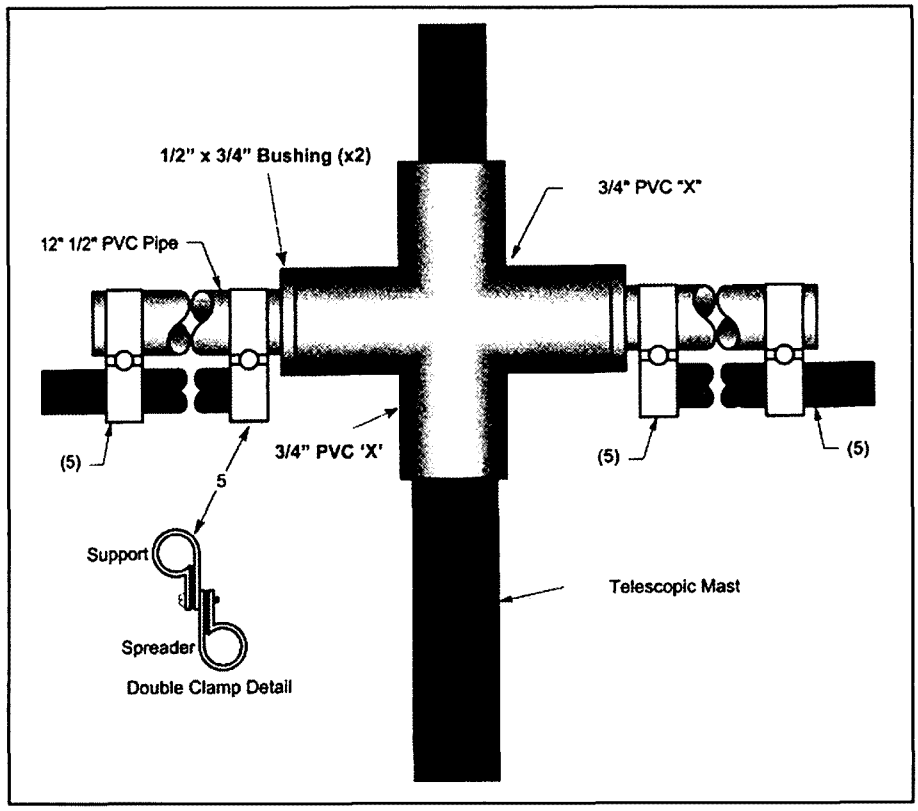


Fig 3. Details of the spreader attachment method

DX - News & Views

VK4OQ,
P.O. Box 7665, Toowoomba Mail Centre, QLD 4352.
Email: john.bazley@bigpond.com

There is no substitute for the DX activity created by CQ WW SSB and CW, taking place on the last full weekends of October and November respectively. Both of these contests regularly stimulate activity and some serious Dxpeditions to relatively rare locations, an excellent opportunity for the serious chaser of countries and IOTA islands. Most Dxpeditions usually announce beforehand whether they will be 'allband or single band' and you KNOW that they will be operating for nearly the entire contest, which should give you more than a reasonable chance of working them.

A country that has been in the 'Top Ten' wanted list for quite some time is, The Yemen.

The following was received from Vladimir Bykov, UA4WHX , (who has been very active lately operating from ST2 and J2).

"Having spent 10 days in Yemen and met a number of people responsible for issuing licences and spectrum management of Yemen Telecom as well as two deputy ministers of the Ministry of Telecommunications Information and Technology, I can probably say this:

1. Not a single amateur radio licence has been ever issued in Yemen in the past 20 years, for those interested in the authenticity of the fact I can probably provide a written statement from the Ministry confirming the fact.
2. Amateur radio has never been legalized in Yemen. Period. No legal base, no exceptions so far. But the Ministry is sincerely interested in promoting the hobby. They know about it and do plan to pass the laws for it as soon as possible.
3. When King Hussein of Jordan was here he requested a licence, which he did not get.
4. The Ministry has tried to authorize amateur radio activity in Yemen a few times but the attempts always got stuck at the Ministry of Interior offices being higher or lower.
5. What may help: write letters (when you have time) to both of those ministries, explaining: -

A. Why it is good

B. Why it is no danger to security

C. Send a bit of printed material.

Then it won't be too long before Yemen goes down to 10 least wanted.

73, Vladimir M. Bykov UA4WHX
In Sana'a, Yemen"

Now to forthcoming DX news

Four members of the Florida DXpedition Group will be in Anguilla from 25 October to 1 November, namely, Bill W4WX (VP2EWX), David WA4ET (VP2EDP), Cory N1WON (VP2ECM), and Clarence W9AAZ (VP2EAZ). Each will operate a different band during the CQ WW SSB Contest, while before and after the contest they will operate on all modes on 6-160 metres. QSL direct to home calls.

Gab HA3JB will be active again as SU8BHI from Egypt from 1st July to 31st December. He plans to operate on all bands CW, RTTY, SSTV, PSK and some SSB, and during many of the major contests. QSL direct only to HA3JB (Kutasi Gabor, P.O. Box 243, H-8601 Siofok Hungary).

WQ7R Ray, plans to be active from Honduras' Roatan Island (NA-057) between October 22nd and November 4th. Look for him probably using the call WQ7R/HR9 on RTTY, PSK and CW on HF, and possibly on CW and SSB on 6 meters. During the CQ WW SSB DX Contest he is expected to be using HQ9R. QSL via N6FF.

Members of the Korean DX Club plan to operate from both the Solomon Islands and Temotu Province in November. They will be QRV as H44HL/H40HL on 6 through 160 meters on all modes. Further details should be available next month.

N4BAA Jose, will be active from Guantanamo Bay (Gitmo) during the CQWW SSB Contest in October. His callsign will probably be either KG4WV or KG4SB. Jose will be QRV starting Tuesday before the contest until Tuesday or Saturday afterward. He will be 160-6M all modes with a heavy emphasis on CW. January 2006 he also plans a KG4SB or KG4WV operation concentrating on the low bands, this will be a 10-14 day operation. For both operations QSL via N4BAA.

W1DV/TL8DV, Dave, is expected to soon be QRV again from the Central African Republic. He'll probably be there for several weeks working on construction of a new orphanage. QSL via W3MC.

A35BO, Tonga, will be on the air October 24th to December 1st, with Alex, HB9FBO operating. He will be on 160-10M including the WARC bands, CW, SSB, and PSK31.

HI3CCP will be on from the Dominican Republic in the CQWW SSB October 29-30. The Lomadeltoro Contest Team, HI3CCP, HI3TEJ, HI3NR and HI8ROX will be on the air as a multiop. QSL via ON4IQ.

OK1LO, Lada, will be heading back to Iran in September. He plans to take a vertical antenna (10, 15, 20 metres) for the EP3PTT club station and he also wants to install an 80 metre sloper.

More information is now available on the planned trip to East Kiribati T32 that I mentioned last month. It is planned to operate from two new IOTA islands. The first will be Flint Island and if they are unable to land there they will try Vostok Island. The other will be Millenium Island. The operators will be T32Y (Nando IT9YRE), T32SNW (Claudio I1SNW) and T32EJW (Alfio IT9EJW).

QSL to the individual operators T32Y Fernando Rubino, PO Box 30, 96012 – Avola (SR) – Sicily, Italy T32SNW Cláudio Scaglia, PO Box 161, 14100 – Asti (AT), Italy and for T32EJW Álfio Bonano, PO Box 18, 95028 – Valverde (CA), Italy

An operation from Cambodia is planned by Jacques ON4AJV and Willem ON6TZ from 30th October to 10th November on all HF bands - SSB and CW with the callsign XU7TAS. QSLs should be directed via ON4AJV – Jacque Vandenabeele, Tem Poele 36,8430, Midddelkerke, Belgium.

So that about 'wraps up ' this month. Comments please by the 8th October for November *Amateur Radio*.

Special thanks to the authors of *The Daily DX* (W3UR) - 425 *Dx News* (I1JQJ) and QTC DX PY2AA for information appearing in this month's *DX News & Views*. Interested readers can obtain from W3UR a free two week trial www. dailydx. com/order.htm **ar**

Contests

Ian Godsil VK3JS
WIA Federal Contests Co-ordinator

Contest Calendar September - November 2005

Sep	3	Russian Radio RTTY Contest	(RTTY)
	3/4	All Asian DX Contest	(SSB)
	10/11	Worked All Europe DX Contest	(SSB)
	24/25	CQ WW RTTY DX Contest	(RTTY)
Oct	1	PSK31 Rumble	(PSK)
	1/2	Oceania DX Contest	(SSB)
	8/9	Oceania DX Contest	(CW)
	10	10-10 International Day Sprint	(All Modes)
	15/16	JARTS WW RTTY Contest	(RTTY)
	16	Asia-Pacific Sprint Contest	(CW)
	16	RSGB 21/28 MHz Contest	(CW)
	29/30	CQ WW DX Contest	(SSB)
Nov	12/13	Japan Intl. DX Contest	(SSB)
	12/13	Worked All Europe DX Contest	(RTTY)
	26/27	CQ WW DX Contest	(CW)

Greetings to all Readers

One of the things about writing articles like this is that you get to think in advance. As I begin these notes the RD has not yet happened; but by the time you read them it will be all over.

Now that we have experienced the new Rules, it would be a good time to ask for opinions about all aspects of the contest. As I wrote last month, one revision may not be enough.

I take this opportunity to invite comments from anyone on how they found this year's Remembrance Day Contest, eg did the changes of rules induce you to operate in the early hours of Sunday morning in order to get bonus points? Were you enticed to try UHF+ ? Were you enticed to try different modes on the same band?

Two things I would like to throw in to start discussions

1. I hope that we shall always remember that this is a MEMORIAL contest, to honour those who served and died in conflicts of war. In this sense it is the Diggers' Contest, even though there be few original Diggers left these days and most of those are not Amateur Radio Operators.

   On this basis it could be argued that CW should be almost the exclusive mode for the event, as that was still dominant in WW2. Even a dedicated CWer like me will recognize the stupidity of that argument in the light of today's plethora of modes.

   However, it is a contest with a purpose outside making contacts to win. We need to keep it "friendly", but I still make no apologies for opposing the idea of using contacts as an opportunity to catch up with old friends once a year!
2. In this day and age I suggest that there is no valid reason for contesters NOT to use logging programs of one type or another. I know that the RD in particular presents problems with scoring by having bonuses, points dependent on distance, etc. However, there are chaps out there who are well able to devise some sort of electronic scoring system. Two that come to mind particularly are Alan VK4SN and Mike VK3AVV. Mike has a traditional-style logger that can cover several VK contests, while Alan has an excellent "auto-scorer" for the VK/trans-Tasman Contests. Perhaps these two operators can redesign their programs to cope with the new RD scoring system, albeit with some external input from us after the contest in order to cope with bonus points.

Either way, I would like to challenge skilled programmers to devise a suitable logger to cope with VK contests.

Simple Logging

Even if there is not a fully-fledged logger for VK contests in its own right, there really is no excuse for not using your computer for even simple logging. Almost all of us today will have one or more computers in our shacks. If we only use them as glorified typewriters, then we seriously undervalue the ability of the machine and ourselves to learn new skills.

Lest you say "I can't type fast enough", the answer is PRACTICE. When you learnt Morse and Theory, you practised until you became proficient. So with typing. There are tutoring programs and good books to guide you to using ALL fingers. I agree, two fingers are a drawback, ten are not!

The simplest form of logging is just a blank page with spaces for entering QSOs (see fig. 1). It is not hard to learn to enter the basic contact information

as you go along, ie name of station and exchange. Scoring can be done after the event. The important thing is that the vital information is already in your computer, not spread over pieces of paper. Also, this document is a text document, easily readable by any computer. More ambitious programs may need other help to make them work properly.

Later, how easy it is to list all relevant information onto a Summary Sheet (see fig. 2).

Thus you have done what the rules ask by submitting your Log and Summary Sheet and it has not taken you nearly so long to finish it all.

As I said, this is simple logging. It can be practised before next year. Then, the more adventurous amongst you will harness the power of a spreadsheet to achieve the same effect, with the added bonus of the scoring happening as you go – more like a traditional logging program.

Summary

My thrust now is to encourage Australian contestants to make use of computerized logging as a normal and automatic form. Also, to encourage debate and discussion on the future of contesting in Austalia. You may remember that in June I suggested that if we are not more active then there may not be any contests or AR by the end of the next decade.

I have received a most interesting letter from Ernie VK3CEW with his thoughts on contesting in VK. Next month I shall continue this theme by quoting from his letter. In the meanwhile, please have a think about what is written here and let me have your thoughts. You may email me at vk3js@vkham.com or write QTHR.

73 and good contesting,

Ian Godsil VK3JS.

CONTEST LOG SHEET Page:

CONTEST NAME:

DATE:

CATEGORY: SINGLE OPERATOR
SECTION: PHONE CW MIXED

STATION: VK3JS/QRP

TIME UTC	STATION WORKED	BAND	MODE	RST	RST SENT	MULT RCVD	POINTS

TOTALS:

TOTAL POINTS CLAIMED THIS PAGE:

Fig 1

SUMMARY SHEET

CONTEST NAME:

DATE:

STATION:

OPERATOR:

CATEGORY: SINGLE OPERATOR

SECTION: CW PHONE MIXED

LOCATION:

SCORE SUMMARY: contacts
multipliers X points

CLAIMED SCORE: **POINTS**

EQUIPMENT:

DECLARATION: I hereby state that I have operated in accordance with the rules and spirit of the Contest and have observed all Radio regulations.

Signed.....

Comments:

Fig 2

Plan ahead for October

Oceania DX Contest 2005 : (SSB) 1 - 2 October, (CW) 8 - 9 October

2004 Oceania DX Contest Results

1. Introduction

Congratulations to all the winners in the 2004 Oceania DX Contest, and especially VK6DXI who ended up winning the Oceania Single-Op All Band category in both the PHONE and CW sections.

Overall activity was similar to that experienced in 2003, despite the 10 cm solar flux index dropping from around 110 during the 2003 contest to 90 in the 2004 contest.

Compared to 2003, there was around a 21% increase in the number of logs submitted. The increase in participation appears to have offset the impact of any decline in conditions on the higher HF bands. The increased interest is encouraging and indicates that the contest is in good health.

2. PHONE Results

The leading stations and top scores for the PHONE section are summarised in Tables 1, 2 and 3 below. The full results are presented in Annex 1, along with soapbox comments and equipment/antenna information in Annexes 3 and 4.

VK6DXI leads the Oceania Single-Op All Band category with a score of 1,827,868. VK2APG is not far behind with a score of 1,657,200 and 9M6A (op G4MJS) in East Malaysia is in third place with a score of 1,081,752. The top entrants from other Oceania countries in the Single-Op All Band category are ZL2UO (New Zealand), WH2V (Guam), DU7MHA (Philippines) and YB4IR (Indonesia).

The ZL6QH team at the Quartz Hill club station was the only station in the Multi-Multi category and achieved a score of 3,682,636. ZL4AA takes the top position in the Oceania Multi-One category with a score of 828,768, but is closely followed by ZL1AA with a score of 827,931.

An entry of note is YC3BDJ who entered the Single-Op 15m category to achieve the highest score in Indonesia, as well as 10th position overall in Oceania.

Category	Asia	Europe	North America	Oceania	South America
SWL ALL	UA0-107-181	LZ2F-319		ZL2001SWL	
SINGLE-OP ALL	JH4UYB	ER1Q	K3ZO	VK6DXI	LU2NI
SINGLE-OP 80M	RA0BA		W7AV	VK2HPM	
SINGLE-OP 40M	JR9NVB	PA7A		YB2OK	
SINGLE-OP 20M	JA6GCE	RA6DB	N4MM	YB0A	PY3YD
SINGLE-OP 15M	JF3BFS	OZ1ADL	W7KPL	YC3BDJ	PT2ND
SINGLE-OP 10M	JA2MWV				
MULTI-ONE	RK9CWA	9A4P		ZL4AA	CE2RLS
MULTI-MULTI				ZL6QH	

Table 1: Continent Winners in PHONE Section

Callsign	Category	Score
ZL6QH	MULTI-MULTI	3682636
VK6DXI	SINGLE-OP ALL	1827868
VK2APG	SINGLE-OP ALL	1657200
9M6A	SINGLE-OP ALL	1081752
ZL4AA	MULTI-ONE	828768
ZL1AA	MULTI-ONE	827931
VI6175WA	MULTI-ONE	774364
ZL2UO	SINGLE-OP ALL	693048
WH2V	SINGLE-OP ALL	629926
YC3BDJ	SINGLE-OP 15M	593328

Table 2: Top Ten Oceania Stations in PHONE Section

Callsign	Category	Score
JH4UYB	SINGLE-OP ALL	59220
RZ3BY/0	SINGLE-OP ALL	32072
ER1Q	SINGLE-OP ALL	17984
RW0CF	SINGLE-OP ALL	16120
RD3A	SINGLE-OP ALL	15435
RW0AR	SINGLE-OP ALL	11988
UT2IY	SINGLE-OP ALL	11776
LZ2F-319	SWL ALL	10731
JA7ODY	SINGLE-OP ALL	8904
7S2E	SINGLE-OP ALL	8901

Table 3: Top Ten Non-Oceania Stations in PHONE Section

JH4UYB again takes the top position outside Oceania with a score of 59,220. Second place goes to another Asian station, RZ3BY/0, with a score of 32,072. ER1Q is the highest European station and achieves third place overall with a score of 17,984. The top entrant from North America is K3ZO, a long time supporter of the contest, and the top entrant from South America is LU2NI.

3. CW Results

The leading stations and top scores for the CW section are summarised in Tables 4, 5 and 6 below. The full results are presented in Annex 2, along with soapbox comments and equipment/antenna information in Annexes 3 and 4.

The top station in the Oceania Single-OP All Band category is VK6DXI from Western Australia with a score of 3,490,290. VK4EMM went portable this year to take second position with a score of 3,457,776. Third position goes to ZL1TM in Auckland with a score of 1,813,784. The top entrants from other countries in the Single-Op All Band category are YB0DPO (Indonesia), YJ0AX (Vanuatu), and DU7MHA (the Philippines).

The only Oceania entrant in the Multi-Multi category was ZL6QH with a score of 6,805,017. First place in the Oceania Multi-Single category goes to ZM1A with a score of 3,594,864.

Category	Asia	Europe	North America	Oceania	South America
SWL ALL	UA0-107-181	LZ2F-166			
SINGLE-OP ALL	JG1IGX	LY3UM	N6RO	VK6DXI	LU1EWL
SINGLE-OP 80M	JM1NKT				
SINGLE-OP 40M	JA1PS	SP4DEU	W7DRA		
SINGLE-OP 20M	RW0AR	RA6DB		VK4BUI	
SINGLE-OP 15M	RW0LIA	UA3DEE	N4MM	YB0WWW	PY7GK
SINGLE-OP 10M	7K2PBB	ES1QD	K2EKM	VK2CZ	
MULTI-ONE	RK9JWV	RK3SWB		ZM1A	
MULTI-MULTI	RK0LWW			ZL8QH	

Table 4: Continent Winners in CW Section

Callsign	Category	Score
ZL6QH	MULTI-MULTI	6805017
ZM1A	MULTI-ONE	3594864
VK6DXI	SINGLE-OP ALL	3490290
VK4EMM	SINGLE-OP ALL	3457776

ZL1TM	SINGLE-OP ALL	1813784
ZL4AA	MULTI-ONE	1042074
VK4AN	SINGLE-OP ALL	969088
YB0DPO	SINGLE-OP ALL	784096
VK4TT	SINGLE-OP ALL	782856
VK2KM	SINGLE-OP ALL	711970

Table 5: Top Ten Oceania Stations in CW Section

Callsign	Category	Score
N6RO	SINGLE-OP ALL	33984
JG1IGX	SINGLE-OP ALL	15568
UA0CA	SINGLE-OP ALL	15498
LY3UM	SINGLE-OP ALL	11450
UA9PC	SINGLE-OP ALL	11124
KM4M	SINGLE-OP ALL	9417
RD3A	SINGLE-OP ALL	9016
UA0SC	SINGLE-OP ALL	8256
UA0LCZ	SINGLE-OP ALL	7360
RV4LC	SINGLE-OP ALL	7310

Table 6: Top Ten Non-Oceania Stations in CW Section

Outside Oceania, N6RO is the clear leader in the Single-Op All Band category with a score of 33,984. JG1IGX is in second place with a score of 15,566 and UA0CA is close behind in third place with a score of 15,498. The top entrant from Europe is LY3UM and the top entrant from South America is LU1EWL.

4. Awards

The recipients of trophies and plaques for the 2004 contest are listed in Table 7. Certificates will be awarded to the top scoring station in each category for each continent and country, subject to the station having made at least ten QSOs.

The Contest Committee is still working on a new design for the contest plaques and certificates. The intention is to apply this new design to the 2004 plaques, as well as the plaques that are still to be distributed for the 2001, 2002 and 2003 contests.

AWARD	DESCRIPTION	RECIPIENT
ZL2TT Memorial Trophy	Top entrant from Oceania in Single Operator All Band PHONE category - Ron Wills, ZL2TT Memorial trophy sponsored by ZL2GI, ZL2AL, Wellington Amateur Radio Club and NZART.	VK6DXI
Oceania Single-Op ALL Band CW Plaque	Top entrant from Oceania in the Single Operator ALL Band Category	VK8DXI
VK2QL Memorial Trophy	Top entrant from VK in Single Operator All Band CW category - Frank Hine, VK2QL Memorial trophy sponsored by WIA Federal.	VK6DXI
VK5/VK8 Single-Op ALL Band PHONE Plaque	Top entrant from VK5 or VK8 Call areas in Single Operator All Band PHONE category - Plaque sponsored by WIA South Australian Division	VK8HPB
VK5/VK8 Single-Op ALL Band CW Plaque	Top entrant from VK5 or VK8 Call area in Single Operator All Band CW category - Plaque sponsored by WIA South Australian Division	VK8AV
VK7 Single-Op ALL Band PHONE Plaque	Top entrant from VK7 Call area in Single Operator All Band PHONE category - Plaque sponsored by WIA Tasmanian Division	VK7VH
VK7 Single-Op ALL Band CW Plaque	Top entrant from VK7 Call area in Single Operator All Band CW category - Plaque sponsored by WIA Tasmanian Division	VK7GN
ASIA Single-Op ALL Band PHONE Plaque	Top Entrant from Asia in Single Operator All Band PHONE category - Plaque sponsored by Australia Eastern Mountain and Districts Radio Club	JH4UYB
ASIA Single-Op ALL Band CW Plaque	Top Entrant from Asia for Single Operator All Band CW category - Plaque sponsored by Australia Eastern Mountain and Districts Radio Club	JG1IGX
NORTH AMERICA Single-Op ALL Band PHONE Plaque	Top Entrant from North America in Single Operator All Band PHONE category - Plaque sponsored by N6RO	K3ZO

Table 7: 2004 Trophy and Plaque Winners

5. Conditions

The 10cm solar flux index for the 2004 contest was around 90, compared to around 110 for the 2003 contest. Despite the reduced flux index, Charts 1 and 2 below show that the overall level of activity is similar to that experienced in 2003. The greater number of participants in the 2004 contest appears to have offset any decline in HF propagation.

Inspection of the charts shows that all of the bands between 40m and 10m were in good shape for the CW weekend, but only the 20M and 15M bands delivered much action during the PHONE weekend. There was very little activity on 80M and only a few QSOs on 160M - one of the future challenges is to encourage more activity on these bands.

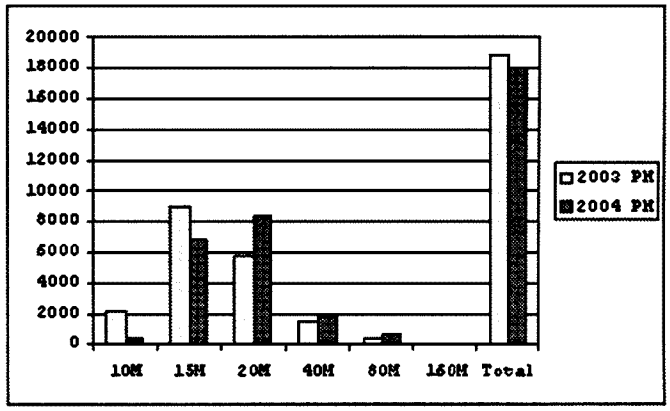


Chart 1: Number of QSOs in Oceania PHONE Logs

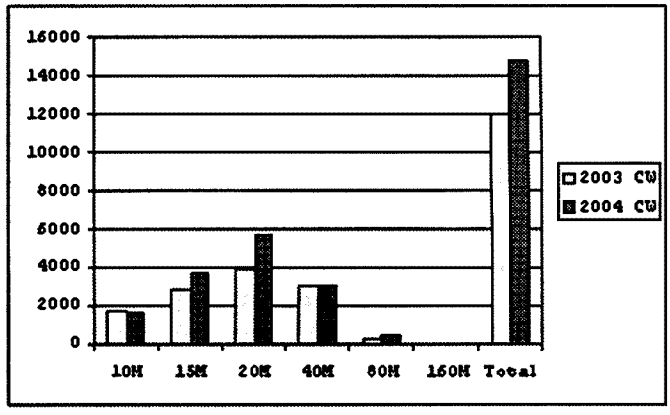


Chart 2: Number of QSOs in Oceania CW Logs

6. Participation

Chart 3 shows the trend in the number of logs submitted (including check logs) since 2000. Tables 8 and 9 provide a breakdown by continent.

The number of logs submitted has more than doubled over the period shown and there was a 21% increase between 2003 and 2004. Most of the additional logs are from Europe, with 53% of the logs coming from this continent in 2004.

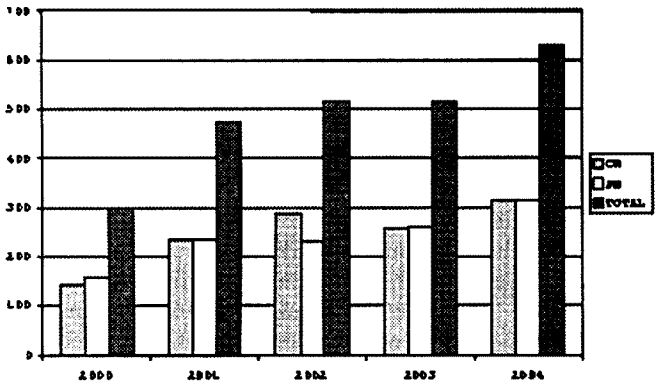


Chart 3: Number of Logs Submitted (including check logs)

Year	Africa	Asia	Europe	North America	Oceania	South America	Total
2000 PH	0	46	72	10	28	2	158
2001 PH	0	70	110	10	42	5	237
2002 PH	0	75	95	11	44	4	229
2003 PH	1	90	110	12	42	6	261
2004 PH	0	68	149	12	59	5	313

Table 8: number of logs received for PHONE section

Year	Africa	Asia	Europe	North America	Oceania	South America	Total
2000 CW	0	52	64	10	15	2	143
2001 CW	0	57	133	17	27	2	236
2002 CW	0	59	164	24	34	6	287
2003 CW	0	71	138	21	23	3	256
2004 CW	0	79	183	22	27	4	315

Table 9: number of logs received for CW section

The upward trend in participation over the period 2000 to 2004 can be attributed to the ongoing efforts of the new joint VK/ZL management committee that was established in 2001. Initiatives undertaken by the Committee to rejuvenate the contest have included:

- the establishment of a new series of awards;
- the introduction of a revised set of rules;
- wider promotion of the contest including the establishment of www.oceaniadxcontest.com web pages; and
- the introduction of comprehensive log checking and results reporting.

There are still plenty of opportunities for improvements to further encourage participation in the contest. In particular we want to continue improving the log checking process so that there is a more timely publication of results and distribution of awards.

7. Log Checking

The Committee is pleased to note the increasing use of email for the submission of logs - 82% of the 2004 logs were delivered this way, compared to 79% in 2003 and 57% in 2001. Unfortunately, many of the email logs are not presented in the required Cabrillo format and require significant reformatting before they can be checked. To address this issue the Committee is investigating the use of an email robot for the 2005 contest. The robot would automatically check the formatting of logs as they are submitted and request logs to be resubmitted if they do not meet the specified format.

The scores of some of the 2004 SWL entries are substantially less than the claimed scores. In most cases this was due to duplicates being ignored or violations of Rule 11 which states "The same callsign may appear only once in any group of 3 consecutive entries in the 'station being worked' column".

8. 2005 Contest

The 69th Oceania DX contest will be held on the first two weekends of October 2005 as follows:

PHONE Section:	0800 UTC Saturday 1 October to 0800 UTC Sunday 2 October
CW Section:	0800 UTC Saturday 8 October to 0800 UTC Sunday 9 October

9. More Information

Further information about the 2004 results (including soapbox comments and station equipment/antenna lists) and the full rules for the 2005 contest are available from the Oceania DX Contest web site at www.oceaniadxcontest.com

10. Thank You!

Thank you to the members of the Oceania DX Contest Committee and the additional log checking volunteers (ZL1CT and ZL2AOH) who managed the various tasks for the 2004 contest - a huge effort involving around 200 person hours. We also gratefully acknowledge the financial support provided by NZART, WIA and the sponsors of awards.

Most importantly, thank you to everyone who participated in the 2004 contest and made it such a success. We look forward to seeing everyone again, along with new entrants, in the 2005 event. Let's hope for some good conditions and make it the biggest and best Oceania DX Contest ever!

73 from

Oceania DX Contest Committee (ZL1AZE, ZL2BSJ, ZL3GA, VK1JDX, VK2AYD, VK2CZ, VK2FHN, VK3TZ, and VK4EMM)

VHF/UHF - an expanding world

David Smith VK3HZ - vk3hz@wia.org.au
Leigh Rainbird VK2KRR - vk2krr@wia.org.au

Weak signal

David Smith - VK3HZ

On July 21st, we again saw a similar opening to the one reported in the last column, where an intense high pressure cell floated across the south of the country. Stations heard include VK5's PO, ZLX, AKK, NY, ZK, DK and JL and VK3's AFW, AXH and HZ. At this location, Roger VK5NY on 70 cm reached S9 + 20 dB on my (recently calibrated) "S" meter. Signals from all stations were over S9 on 2 m.

The Gridsquares League Table is a competition hosted by the NSW VHF DX Group and maintained by Guy VK2KU. In the past, this table has been restricted to VK stations only. Guy has recently decided to allow ZL stations to be listed as well. The latest table has just been released (see August AR) and is updated approximately every 3 months. So, hopefully the next update should see a few new callsigns from across the pond competing with the locals.

On August 7th, a new Region 1 record was set for the 2 m band. A large tropo opening over the Atlantic allowed Tim G4LOH to work RW1ZC/MM who was operating from a fishing trawler off the coast of Mauritania. Total distance was 3493 km. Several contacts were had over several hours with signals reaching S7.

This new record prompts me to think that there are only four things needed for such a contact - you need to be on air, the band needs to be open, there needs to be another station located at the other end of the opening and that station needs to be on. Fairly simple really! Perhaps we need to encourage Russian fishing trawlers with active 2 m stations onboard to operate in the Indian Ocean off the southern tip of WA.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital DX modes

Rex Moncur - VK7MO

Welcome to Peter VK5ZPG at Quorn near Port Augusta, Grid locator PF97aq, who is operational on FSK441 on two metres and participating in the Weekend Activity Sessions. Wayne, VK4WS, has his station going well and completed two metre contacts with three VK3s, as well as VK5 and VK7 in one session.

It is often useful during the FSK441 Activity Sessions to send reports to two stations and the following procedure, which shows the progress of two contacts from the perspective of VK3HY, has been adopted:

VK2AWD/27 VK4WS/R36 VK3HY
AWD/RRR 4WS/73 VK3HY
AWD/73 VK3HY

Note that the call sign of the other station is abbreviated only after full call signs have been exchanged so as to meet the requirements for a valid QSO. In using this procedure one will often need to send more characters than are visible in a WSJT text box, but it is possible to send more characters by typing the full line you wish to send in any box and the first part will just run off the front of the text box.

Send Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

The Magic Band - 6 m DX

Brian Cleland - VK5UBC

Firstly some beacon news. Jack VK2XQ reports the Sydney beacon VK2RSY is back on air on the new frequency of 50.289 MHz. It is running 12 watts to a horizontal dipole at approx six metres, CW mode and transmission is "VK2RSY QF56mh". Reports are welcome at vk2wi@ozemail.com.au.

John VK4FNQ reports that the Townsville beacon VK4RTL on 50.087 MHz, which was being tested from a private residence, has now been located at the club site on Mt Stuart at 584 meters ASL.

John VK4FNQ at Charters Towers reports a good opening on the 23rd July to an area between mid NSW and northern Victoria when he worked several stations including 5 x VK2, 2 x VK1 and 2 x VK3 all at S9. John also reports hearing the FK8 beacon on the 23rd & 25th July, the VK2RHV beacon on the 19th, 23rd & 26 July and the ZL TV on the 23rd July.

Norm VK3DUT reports hearing ZL TV and the ZL3 and FK8 beacons quite often during July and on the 3rd July worked ZL3AAU & ZL3MF, 9th July ZL4LV & ZL3FV, 17th July ZL3MF, ZL3TY & ZL4LV and on the18th July ZL3TY.

Dave, a SWL from Adelaide, reports hearing the following in July:

July 3rd 50.047 VK8RAS/b 0310-0314 UTC 559.

July12th, 50.058 VK4RGG/b 0724-0738 UTC 539 and 0757 UTC 439, 50.288 VK2RHV/b 0725-0735 UTC 549 and 0802-0835 UTC 439, 50.297 VK7RST/b 0726-0740 UTC 559, 50.110 VK4WS 5x4 working VK5RO 0731 UTC.

July13th, 50.047 VK8RAS/b 0727-0805 UTC 569.

July17th, 50.110 0316 UTC VK2XQ 5x6, 50.110 0324 UTC VK2BZE 5x6.

Leigh VK2KRR reports that on the 17th of July there was an Es opening just after lunch when he began hearing the 50.297 beacon from Hobart and then worked Wayne VK4WS on 50.110. Leigh was also hearing the Gold Coast beacon VK4RGG on 50.058. Then on 20th July he reports the Toowoomba TV video on 46MHz was audible just after midnight for an hour.

Please remember to send any 6m information to Brian VK5UBC at bcleland@picknowl.com.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

This month, 2 & 70 FM DX Outstanding Achiever for season 04 / 05, also the July DX report where we had two good duct openings in the southeast.

Mike VK4MIK from Butchers Creek on the Atherton Tablelands of Queensland is awarded the 2 & 70 FM DX Outstanding Achiever award for 2004/2005.

Not only was Mike consistent in sending in reports of all DX in north Queensland for the whole season, but he was involved in some of the longest contacts of the season, thereby achieving his goal of breaking the 1000 km barrier. Mike also became involved in the 70 cm band and currently holds a number of spots on the ANVDG records list.

Mike's magic contacts for the season occurred on 25th October when he was able to work a number of 2 m repeaters in excess of 1000 km on tropo. These were Gympie at 1231 km; Hervey Bay at 1151 km and Bundaberg at 1118 km. Well done Mike, wonder what your next DX goals will be?

There were two good duct openings in the southeast for July, the first occurring on 04/07. Mount Gambier beacons were heard here, but no reports of any FM contacts being made.

The second duct opening was much better and occurred in the evening of the 20th and morning of 21st July. Good signals this time from Mount Gambier, Adelaide, Mildura and Broken Hill beacons up to 1296 MHz.

John VK5NJ from Mt Gambier was heard working into the Mt Macedon repeater VK3RMM. Shane VK5NRV at Woodside and Barry VK5KCX at Gawler made it to the Shepparton repeater VK3RGV, which is over 600 km.

John VK5PO from Eden Valley made it to a number of VK3 repeaters, which included Mt Tassie at 786 km, Shepparton at 642 km, Otway Ranges at 605 km and Mt Macedon at 579 km.

Keep an ear out on 146.875 MHz as I am informed the Murray Bridge repeater VK5RMB has been resurrected. VK5RMB was one of the best repeaters in South Australia and has been off air for at least 6 months. Let's hope it's running as well as before. Thanks to all those involved in its repair.

I occasionally receive reports of illegal operation on the 2 and 70 cm bands. If you do hear illegal operators or any other operation that causes unnecessary interference on 2 m or 70 cm bands please send me a message via email.

Please remember to send through any 2 and 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au

ANVDG Long Distance Competition

The 2005/2006 Australian National VHF DX Group's Long Distance Competition will encourage activity, improve station efficiency, design and performance, and raise awareness of propagation on bands from 144 MHz to 10 GHz.

This competition was thought up by Leigh VK2KRR, based on the group's National Records Table, but runs over a 12 month DX season, from July 1st to June 30th. The ANVDG 2005/2006 Long Distance Competition, if a success, could run each season.

So, unlike the ANVDG National records where you'll be very hard pushed to exceed many of the records and where people think "I have been there and done that so there is no point trying", with the yearly competition you have to get out there and do it all again!

The good thing is that on 1st July at the start of the new season, even a 1 km contact on any band could be the current record, until, of course, someone works 2 km! Be interesting to see the progress and highlights as the season unfolds.

For operators wishing to take part in the competition, send info of relevant contacts to the group email anvdg@bigpond.com with the subject of Long Distance Comp. Include as much detail about the contacts as you like, but you must submit: Your details including your name, callsign, town or locality and grid square, claimed distance, other stations name, callsign, town or locality and or grid square, date of contact.

Each different band is listed separately. There are a number of different categories based on the propagation involved with the top 4 distances listed for each. There are separate listings for each call area from VK 1 to 8. Top 4 National records are listed for each category and band.

The Long Distance Competition table and other information can be viewed at http://www.users.bigpond.com/anvdg/Longdistancecompetition0506.htm

ar

The development of radios in the Flying Doctor Service

Rodney Champness VK3UG

In my first article on the development of radio for the flying doctor service ("Amateur Radio" March 2002), I brought you up to the time when the pedal radio prototype had been developed. Alf Traeger with considerable help from his mentor Harry Kauper had finally cracked the seemingly insurmountable problem of developing a simple portable HF radio transmitter/receiver for use in the outback. Now it is time to take you further along this development path. Note that I said "transmitter-receiver", as the receiver and transmitter were separate entities that happened to be in the same case. The art of developing a transceiver, where the transmitter and receiver share a considerable amount of the circuitry did not appear until many years later.

Alf Traeger with the original "Pedal Radio", November 1928.

The "baby" transceiver

Preliminary details of the "baby" transceiver were given in the first article and more complete specifications can now be given. The word "baby" came as a result of Rev. John Flynn's discussions with radio experimenters. He needed a "mother" station (base station) which looked after a number of "baby" stations (homestead portable stations).

The "baby" was a three valve unit. It had a one valve crystal locked Morse code (CW) transmitter using a B205 valve with an output power of around 1.5 watts on a frequency of 2230 kHz (as shown on the licence). The filament voltage was supplied from two No 6 cells in series, with a rheostat to reduce the voltage to 2 volts at the valve. The high voltage was supplied from the pedal generator (the Mk1 version). This supplied between 160 and 180 volts DC to the plate of the valve under load.

The Mk1 and Mk11 have operating output voltages no higher than 220 volts with normal pedalling. This has been confirmed by tests on pedal generators, and by referring to some of the very early circuit diagrams. Some texts state that the pedal generator supplied 350 volts or so. This is not so, as the valves in this model and later models were rated with maximum design voltages of 135 to 180 volts. The application of 350 volts would have resulted in a spectacular valve failure within seconds of the application of 350 volts!

The radiating system consisted of a quarter wave Marconi aerial/antenna nominally 60 feet (18.3 m) high, and about 105 foot (32 metres) long, fed against a quarter wave counterpoise. The radiating system was tuned by manually adjusting the length of the aerial and counterpoise. This was a laborious task. Traeger allowed 10 to 14 days to fully install one of these "baby" sets and to train the operator in both how to use the set and to send Morse code. The need to receive Morse was not of paramount importance, as the base station operator always transmitted by voice to the out-stations.

High voltage (45 or 60 volt) dry batteries of that era (1928) had rather poor leakage characteristics in tropical climates and would go flat rather quickly. Harry Kauper had experimented with Philips A141 valves, which only required between 2 and 20 volts to operate effectively. Kauper and Alf Traeger came to the conclusion that these valves would be satisfactory in the receiver and the low voltage batteries

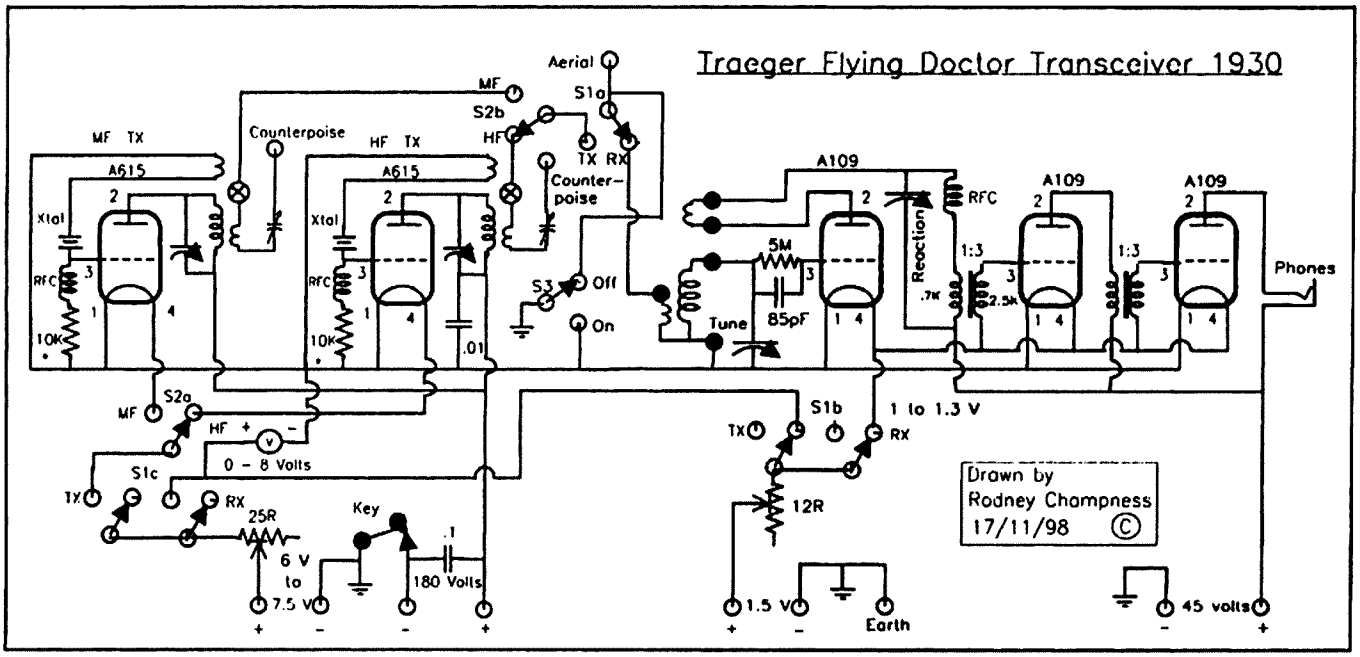


Fig 1. Circuit of the 1930 RFDS radio.

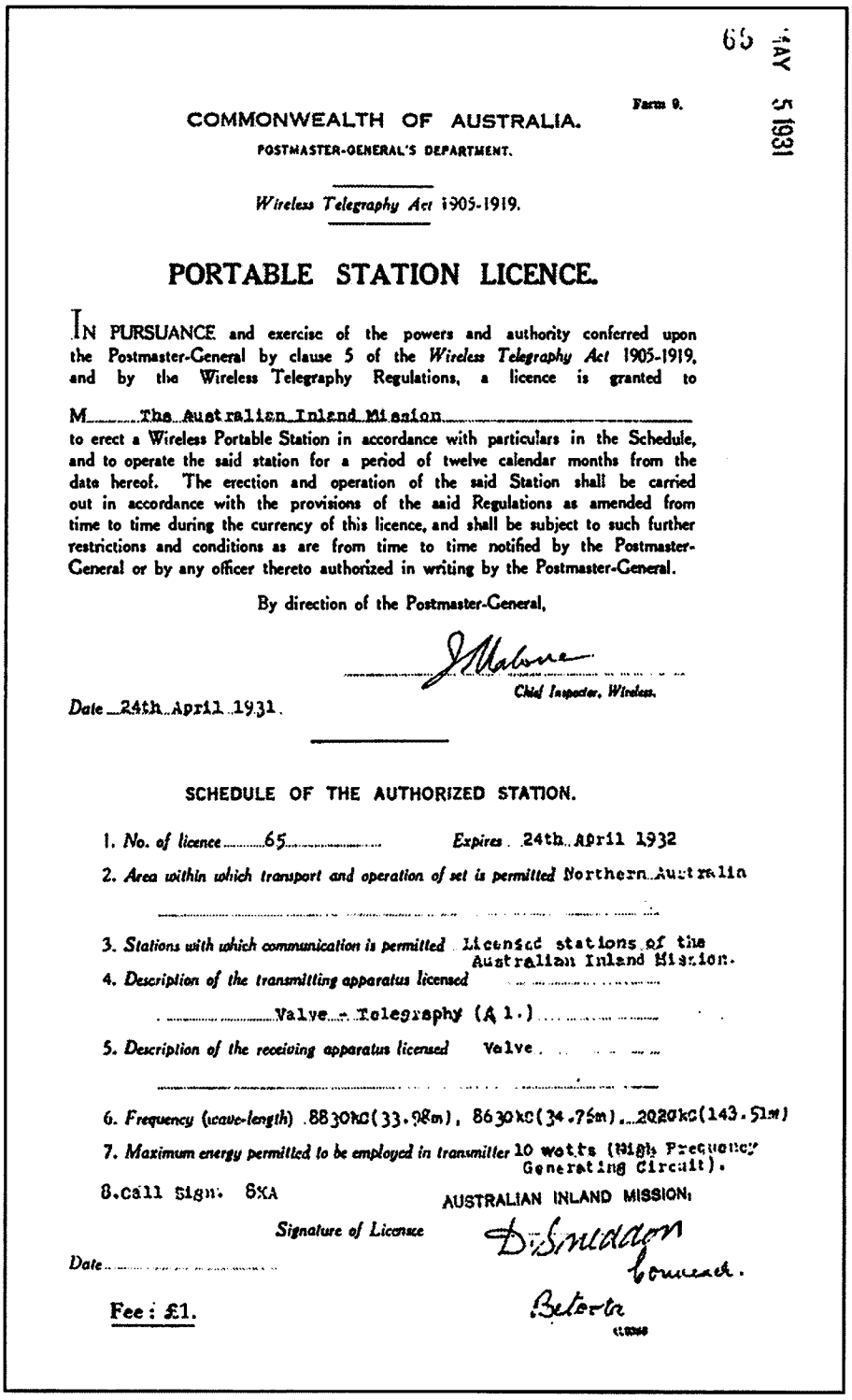
needed to power it would not go flat too quickly. Hence the receiver used two A141 space charge tetrode valves with 9 volts on the plates. The filaments were powered from a 1.5 volt battery.

The receiver used one A141 as a regenerative detector, followed by a transformer coupled audio stage. The total gain of the audio section was around 15 times, as the valve had a gain of around 4½ times and was used with a 1:3½ audio transformer. Not being a high performance set, it only fed headphones.

The receiver tuning ranges were nominally 550 kHz to 1500 kHz and a short-wave band nominally covering either 1.5 to 3 MHz or 2 to 4 MHz, which included 2230 kHz. To effect the change from the broadcast band to short-wave it was only necessary to pull the receiver coil out, tip it upside down and plug it in again. This way the plug in coil could never be mislaid as it was always in the set.

The pedal radio was housed in a "coffin" style wooden cabinet measuring nominally 18 inches (46 cm) wide x 7½ inches (19 cm) high x 9½ inches (24 cm) deep. The set was turned on by raising the lid and turned off by closing it. The changeover from receive to transmit was accomplished by a large multi-function switch that Traeger built for the job. Later models had an even larger switch. The batteries were all contained within the set (see photo next issue). Note, the transmitter valve is missing in the photograph. The set and Morse key sat on the table while the pedal generator was attached to the floor. During 1929 there were a total of six of this model set put into operation within a radius of 600 kilometres of Cloncurry in Queensland.

Perhaps you had believed, as had I, that "pedal radios" were powered exclusively by the pedal generator. This was not so, as it was not practical to operate the complete set from the generator, as it would have required several complicated windings on the armature with commutators for each winding. With variation in pedalling speed, the filament voltages would have varied which would have caused the transmitter output to vary, but problems would have been even more obvious in the receiver. The regeneration control was critical to adjust in this set and would have been just below the point of oscillation for best reception. With variation in pedalling speed, the set would be likely to burst into oscillation, or drop off in gain - a difficult trait for unskilled operators to deal with. Additionally, sparking at the generator armature would cause intolerable interference to reception, and operators would have become exhausted if they had to pedal continuously for up to an hour. It was effort enough to pedal while transmitting.



65 MAY 5 1931

Form 9.

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

Wireless Telegraphy Act 1905-1919.

PORTABLE STATION LICENCE.

IN PURSUANCE and exercise of the powers and authority conferred upon the Postmaster-General by clause 5 of the *Wireless Telegraphy Act* 1905-1919, and by the Wireless Telegraphy Regulations, a licence is granted to

M..... The Australian Inland Mission.....

to erect a Wireless Portable Station in accordance with particulars in the Schedule, and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said Station shall be carried out in accordance with the provisions of the said Regulations as amended from time to time during the currency of this licence, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorized in writing by the Postmaster-General.

By direction of the Postmaster-General,

J. Malone

Chief Inspector, Wireless.

Date 24th April 1931.

SCHEDULE OF THE AUTHORIZED STATION.

1. *No. of licence* 65 *Expires* 24th April 1932
2. *Area within which transport and operation of set is permitted* Northern Australia
3. *Stations with which communication is permitted* Licensed stations of the Australian Inland Mission.
4. *Description of the transmitting apparatus licensed* Valve - Telegraphy (A 1.)
5. *Description of the receiving apparatus licensed* Valve.
6. *Frequency (wave-length)* 8830kc(33.98m), 8630kc(34.75m), 2020kc(143.51m)
7. *Maximum energy permitted to be employed in transmitter* 10 watts (High Frequency Generating Circuit).

8. Call Sign. 8KA

AUSTRALIAN INLAND MISSION

Signature of Licensee D. Snudden Superintendent.

Date

Fee : £1.

Betoota

Fig 2. The 1931 Betoota licence

Pedal radio failures and the upgraded pedal radio

The pedal radios were proving to be doing just what the Reverend John Flynn had hoped they would do. However, problems soon arose. Termites loved eating the wooden cabinets. If they weren't being eaten they were warping in the hot humid atmosphere around Cloncurry in Queensland. Technical problems became apparent too. The receiver was proving to be difficult to operate by non technical people as it had barely enough gain to receive the 50 watt base station at Cloncurry, even with critical adjustment of the regeneration control.

It had become obvious to both the Cloncurry base operator and Alf Traeger that a second frequency near 10 MHz was needed for effective communications by day or night, over ranges to 600 kilometres or more. Hence, application was made to the PMG department for a second frequency. The PMG actually granted three frequencies, two 8 MHz frequencies in addition to the 2 MHz frequency (as shown on a 1931 licence).

Early in 1930 Traeger decided that an urgent re-build was necessary to achieve the performance and reliability that he had hoped for. Traeger, with some help from Kauper, decided to replace the receiver with a three valve unit using A109 valves. The receiver was of a more conventional design than the earlier unit with a regenerative detector and two stages of transformer coupled audio. This gave a total audio gain approaching 700 times that was a great improvement over the previous set with an audio gain of 15. The receiver tuning range was extended from 550 kHz to around 10 MHz to cover all the frequencies that the flying doctor service would use, plus give the folk at these isolated homesteads the opportunity to hear what was going on in the wide world.

Traeger was concerned about the reliability of the transmitters, as there had been an instance where a pedal radio transmitter had failed, resulting in the loss of a life. He decided that the transmitting section of the pedal radio should in fact be two transmitters; one on a nighttime frequency and one on a daytime frequency. This meant that if one transmitter should break down, communications should be possible at sometime during the ensuing 24 hours. He selected an A615 for the transmitter valve. Why he didn't continue with the B205 is unknown as it appeared to be very suitable for the job. Of the three frequencies allocated for the use of the flying doctor service, 2020 kHz and 8630 kHz were selected and used at Cloncurry. The third frequency was ultimately used in Western Australia.

With the addition of the second frequency, it was necessary to alter the radiating system. The 8 MHz frequency was somewhere near a harmonic of the 2 MHz frequency, but not exactly. The antenna was made to suit the 2 MHz frequency, but the transmitter switched the counterpoises so the radiating

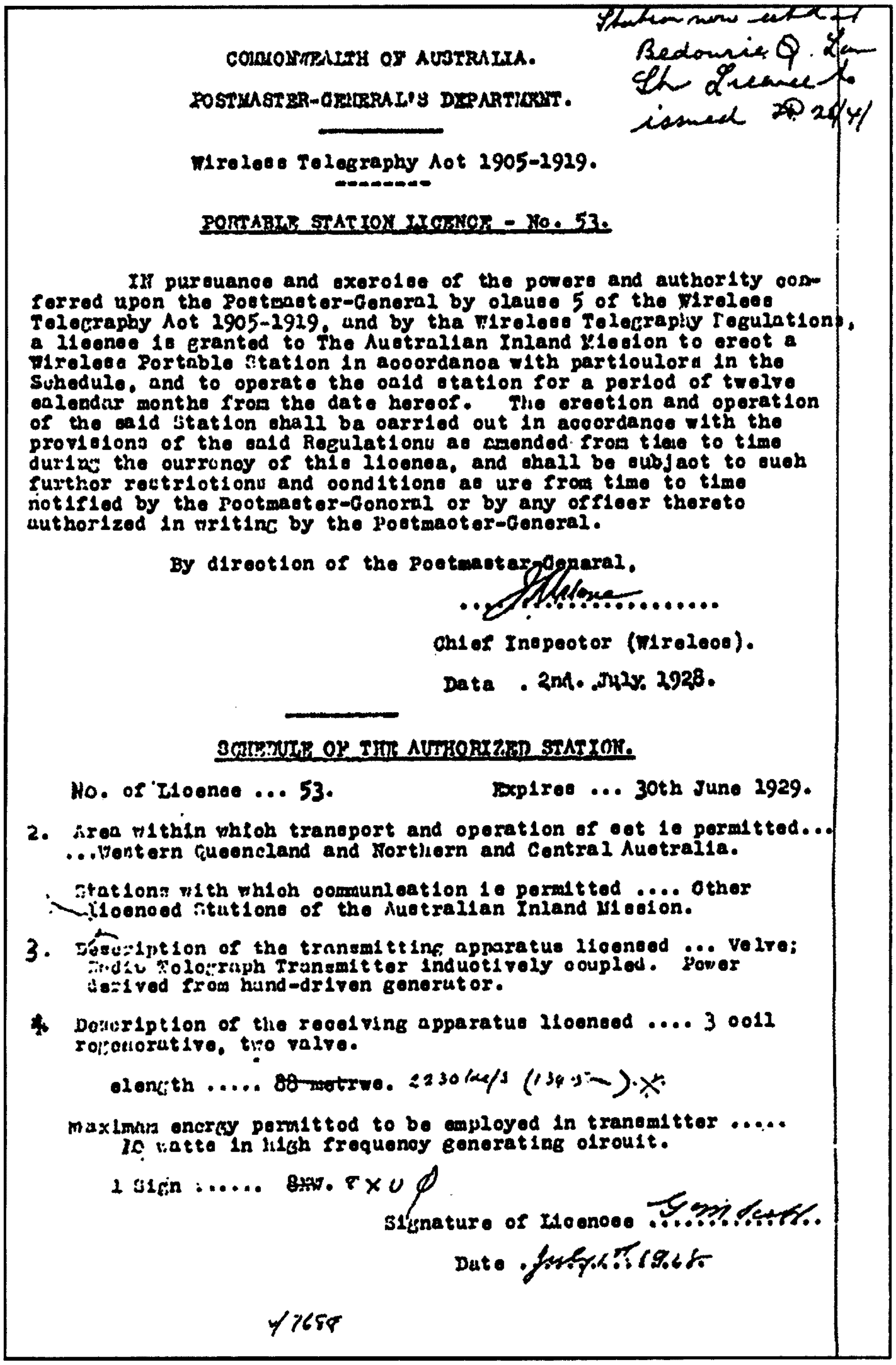
system was resonant on both frequencies at the flick of a switch. Initially the aerial/antenna and the counterpoises had to be resonated by adjusting the lengths of each individual wire, which was a laborious time consuming job.

Later sets had two internal variable tuning gangs, one in series with each counterpoise. Each counterpoise was made physically longer than a resonant length. The capacitor was then adjusted to electrically shorten the particular counterpoise to obtain resonance of the whole radiating system. Resonance in the transmitter tuned circuit and the counterpoise was necessary for the set to put out a good signal. These two controls were adjusted for maximum brilliance of a small pea lamp in series with the antenna. This modification reduced the tuming time for the radiating system to minutes rather than hours.

These replacement sets were built in a larger metal cabinet, which accommodated the much larger transmitter(s) and receiver. The batteries were removed from the cabinet and usually sat under the table. The receiver used a 45 volt battery, despite the fact that electrical leakage may have been higher than desirable. However, the insulation in the batteries was improving all the time. The transmitter filaments required at least four (usually five) No 6 cells in series, while the receiver filaments needed a single No 6 cell to light them.

The original sets were dismantled after being taken out of service, so none are in existence. However, the replacement Augustus Downs set is on display at John Flynn Place in Cloncurry. To my knowledge, this is the only one of this model still in existence and hence the oldest flying doctor radio. I was fortunate enough to be able to inspect this set and draw its circuit, which is shown in this article.

I built a replica of the transmitter and found that the output power of the transmitter was between 1 and 1.5 watts - depending on how hard you pedalled. No doubt many wonder how such low powered transmitters could communicate effectively over such long distances (up to 600 kilometres, or more, from an out-station to the base station in Cloncurry). The answer put simply is - with difficulty. However, several things did assist in making communications possible and practical, and they were -



Station now estd at Bedourie Q. ... Licence to issued 21/4/

COMMONWEALTH OF AUSTRALIA.

POSTMASTER-GENERAL'S DEPARTMENT.

Wireless Telegraphy Act 1905-1919.

PORTABLE STATION LICENCE - No. 53.

IN pursuance and exercise of the powers and authority conferred upon the Postmaster-General by clause 5 of the Wireless Telegraphy Act 1905-1919, and by the Wireless Telegraphy Regulations, a license is granted to The Australian Inland Mission to erect a Wireless Portable Station in accordance with particulars in the Schedule, and to operate the said station for a period of twelve calendar months from the date hereof. The erection and operation of the said Station shall be carried out in accordance with the provisions of the said Regulations as amended from time to time during the currency of this license, and shall be subject to such further restrictions and conditions as are from time to time notified by the Postmaster-General or by any officer thereto authorized in writing by the Postmaster-General.

By direction of the Postmaster-General,

....

Chief Inspector (Wireless).

Date . 2nd. July. 1928.

SCHEDULE OF THE AUTHORIZED STATION.

No. of License ... 53. Expires ... 30th June 1929.

2. Area within which transport and operation of set is permitted... ...Western Queensland and Northern and Central Australia.

Stations with which communication is permitted .... Other licensed Stations of the Australian Inland Mission.

3. Description of the transmitting apparatus licensed ... Valve; Radio Telegraph Transmitter inductively coupled. Power derived from hand-driven generator.

4. Description of the receiving apparatus licensed .... 3 coil regenerative, two valve.

elength ..... ~~88 metrwe.~~ 2230 kc/s (134.5 m).X

Maximum energy permitted to be employed in transmitter ..... 10 watts in high frequency generating circuit.

Call Sign 8XW. 8XU

Signature of Licensee

Date . July 1928

4/7654

Fig 3. The original "baby" licence.

(1) the radiating system at the out-stations was extremely efficient,

(2) not as many radio stations were using short wave at that time, hence less man made interference,

(3) morse code transmissions are detectable at much lower signal strengths than voice transmissions,

(4) the sunspot cycle was coming to a peak (1934),

(5) the use of day and night frequencies, and

(6) there was a very competent and patient operator at the base station at Cloncurry.

to be continued in October edition of *Amateur Radio*

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

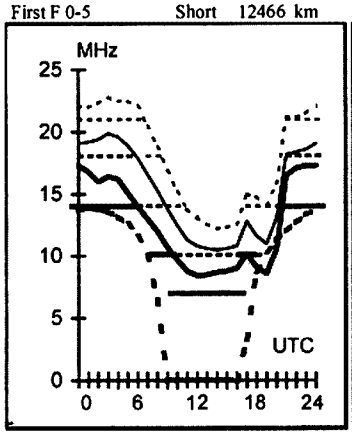
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

September 2005
T index: 24

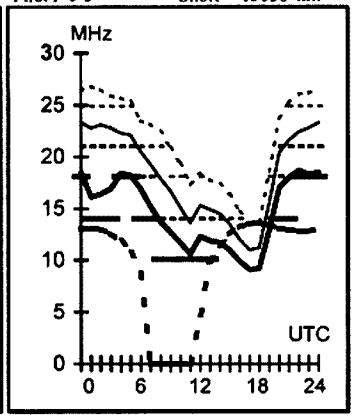
Legend

Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

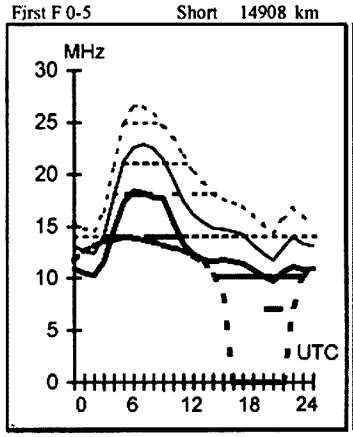
Adelaide-Anchorage 30
First F 0-5 Short 12466 km



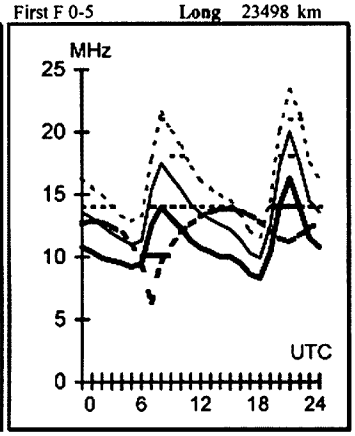
Brisbane-Lima 122
First F 0-5 Short 13056 km



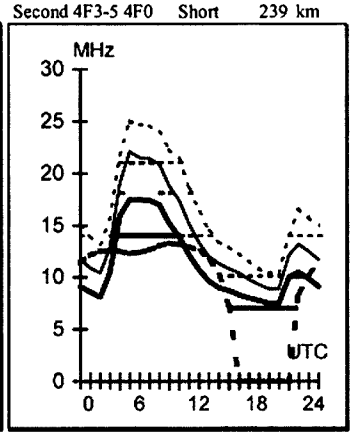
Adelaide-Budapest 305
First F 0-5 Short 14908 km



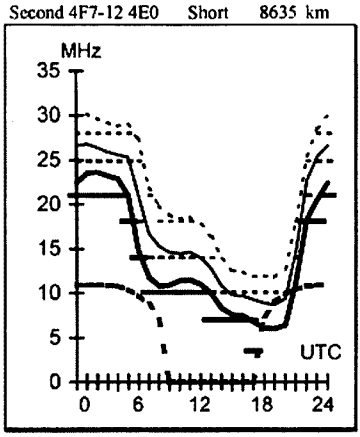
Brisbane-London 147
First F 0-5 Long 23498 km



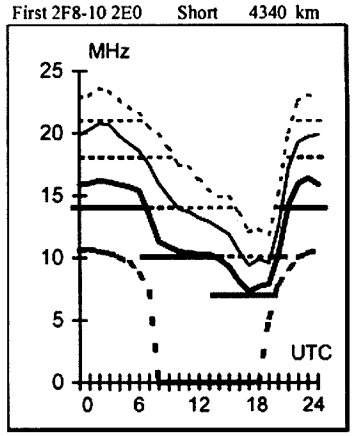
Canberra-Lusaka 239
Second 4F3-5 4F0 Short 239 km



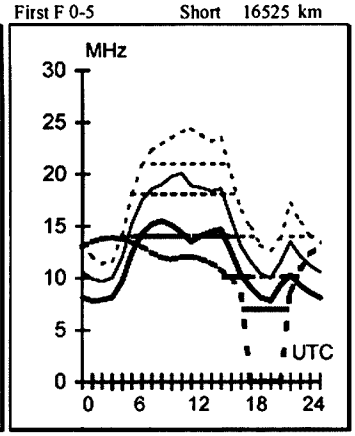
Darwin-Honolulu 65
Second 4F7-12 4E0 Short 8635 km



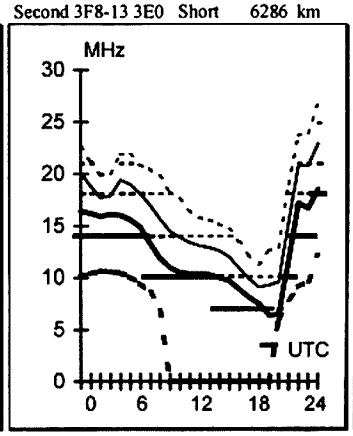
Adelaide-Suva 75
First 2F8-10 2E0 Short 4340 km



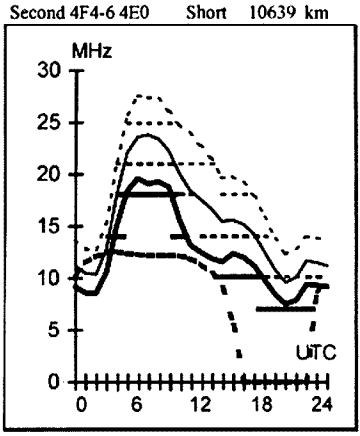
Brisbane-London 327
First F 0-5 Short 16525 km



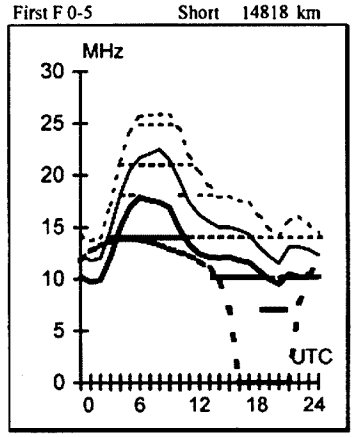
Canberra-Manila 327
Second 3F8-13 3E0 Short 6286 km



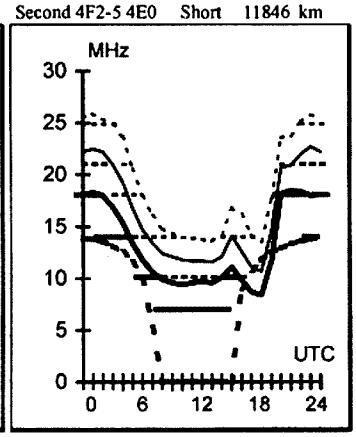
Darwin-Johannesburg 241
Second 4F4-6 4E0 Short 10639 km



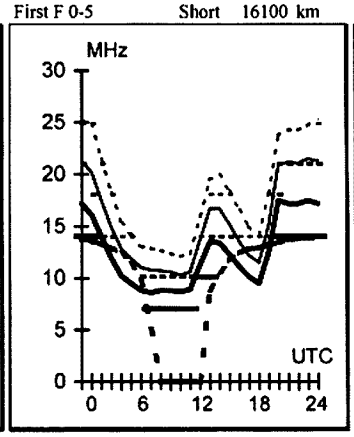
Adelaide-Warsaw 312
First F 0-5 Short 14818 km



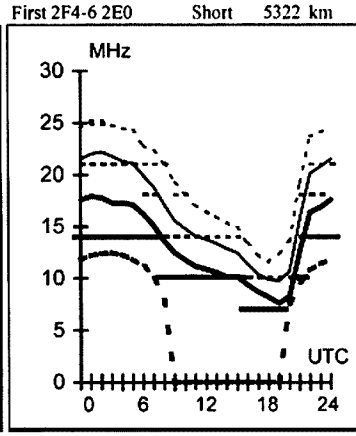
Brisbane-Seattle 44
Second 4F2-5 4E0 Short 11846 km



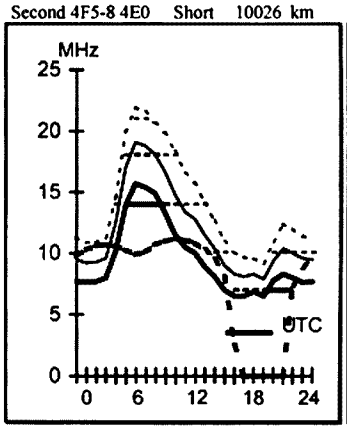
Canberra-Ottawa 59
First F 0-5 Short 16100 km



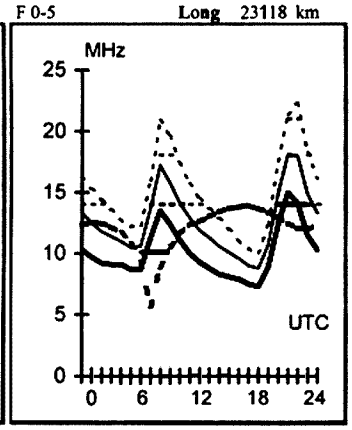
Darwin-Wellington 135
First 2F4-6 2E0 Short 5322 km



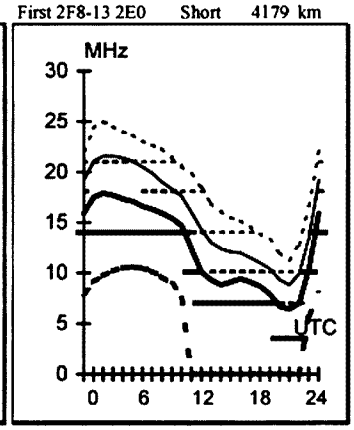
Hobart-Capetown **220**
Second 4F5-8 4E0 Short 10026 km



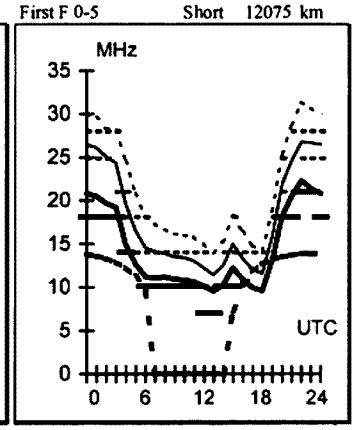
Melbourne-London **131**
F 0-5 Long 23118 km



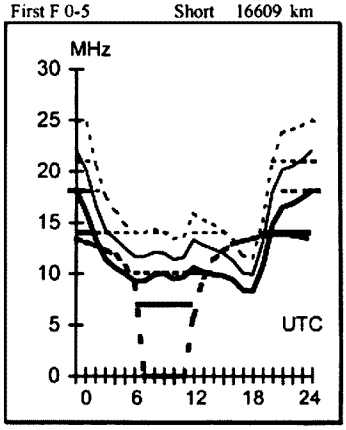
Perth-Kuala Lumpar **336**
First 2F8-13 2E0 Short 4179 km



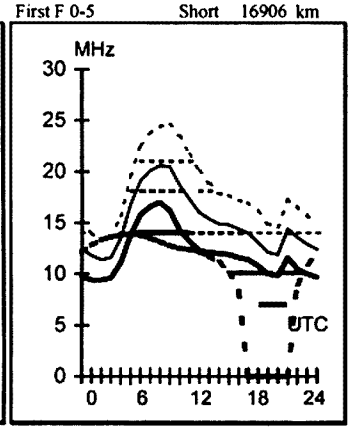
Sydney-Los Angeles **61**
First F 0-5 Short 12075 km



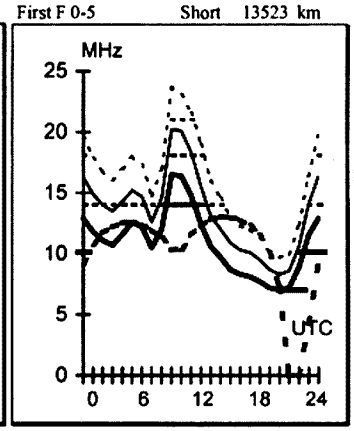
Hobart-New York **80**
First F 0-5 Short 16609 km



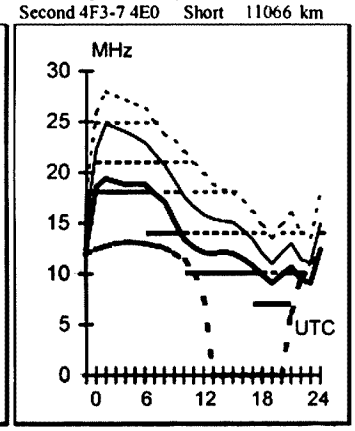
Melbourne-London **311**
First F 0-5 Short 16906 km



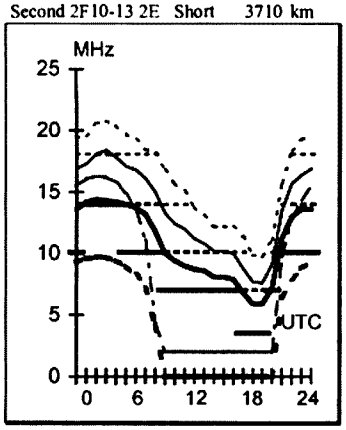
Perth-Rio de Janeiro **203**
First F 0-5 Short 13523 km



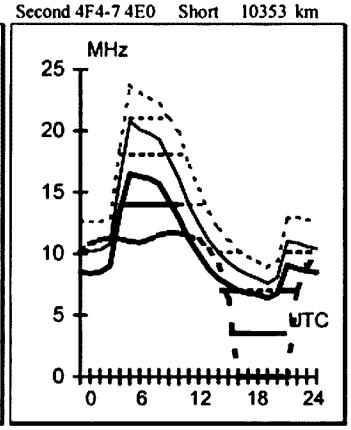
Sydney-RawalpindiLondo **304**
Second 4F3-7 4E0 Short 11066 km



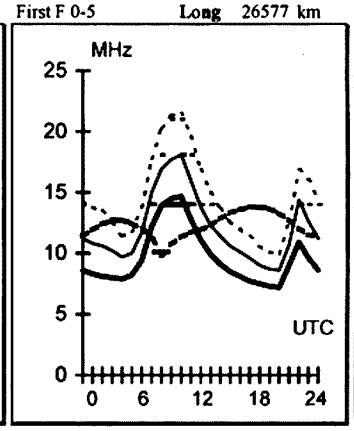
Hobart-Port Moresby **360**
Second 2F10-13 2E Short 3710 km



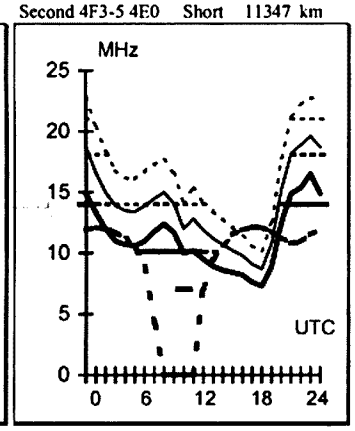
Melbourne-Pretoria **234**
Second 4F4-7 4E0 Short 10353 km



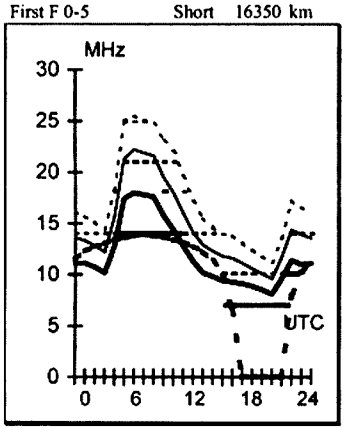
Perth-Stockholm **144**
First F 0-5 Long 26577 km



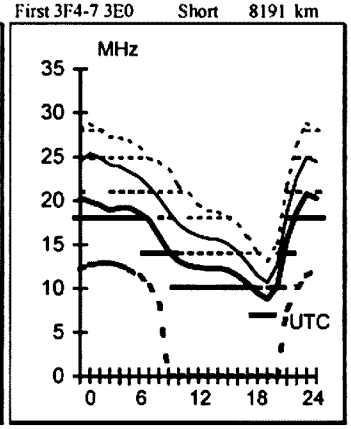
Sydney-Santiago **145**
Second 4F3-5 4E0 Short 11347 km



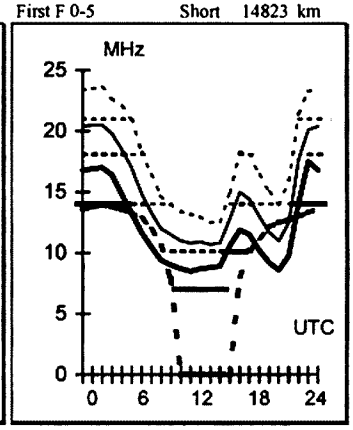
Hobart-Rome **284**
First F 0-5 Short 16350 km



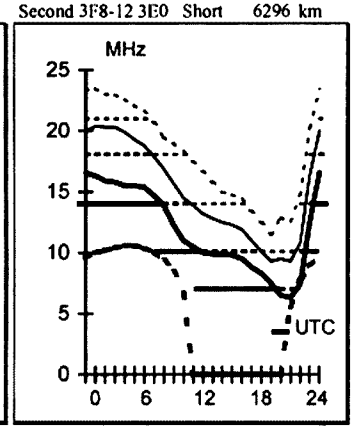
Melbourne-Tokyo **366**
First 3F4-7 3E0 Short 8191 km



Perth-Vancouver **50**
First F 0-5 Short 14823 km



Sydney-Singapore **298**
Second 3F8-12 3E0 Short 6296 km



Hamads *classifieds* FREE

FOR SALE ACT

•**Icom IC-208H** 2m/70cm dual band FM transceiver. The radio is supplied with a mounting bracket with hardware, a back-lit DTMF hand mic with up/down controls, separation cable, and a fused DC power cord, weight 1.2kg, $480. Contact Rod VK1HAI 0429 003 200

FOR SALE NSW

•**HYMOUND** model 100 semi-automatic Morse key (bug). Nice condition and precise keying, $80 plus postage. Ric Havyatt VK2PH. Email: valaric@optusnet.com.au Phone 02 9817 0337

•**Sangean ATS-505** General Purpose MW/FM/SW portable radio receiver with **SSB** capability. As new with case and handbook, $100 plus freight. Trevor VK2TO QTHR, email radmark@ozemail.com.au, mobile 0414 301 106

FOR SALE VIC

•**Satellite System:** Brand new, all components in original cartons. 3.6 m Orbitron Mesh Dish with polar mount, 60cm Actuator Arm, Echostar 8700 Analog Rec/Positioner with RF control. Chaparral Micropak 25 Degree C Band LNB and Feed Horn. 26 m RG11, 26 m each of 3 core and 7 core control cable. All instruction and assembly manuals. Buyer to collect, inspection can be arranged. Originally cost $2450, make a reasonable offer. Contact Keith 03 5243 5184 Geelong Radio & Electronics Society VK3ANR

•**7 inch TFT video monitor**. Brand new NTSC/PAL 16:9 or 4:3 format. Wireless remote, two video inputs. Standard radio in-dash size. Digital clock, 7.5W consumption, $216 ono. Contact Ian VK3AQU QTHR or 0418 579 422. lorian@netc.net.au

•**Military HF receiver Collins R-105-ARR-15** used as replacement for BC-348 in WW2 Aircraft. Complete with mounting rack. No modifications and with original dynamotor, $380. NOTE: A VK7 amateur emailed re this receiver in April. Please contact again if interested as address inadvertently deleted while overseas. **Collins designed R-392 receiver** (made by Stewart Warner). Complete with LS-116 speaker, power and audio output plug and some spare valves. Operates on 28 V DC, no mods, $340. GC. **BC-224 D receiver**. This is the 12V equivalent of the BC-348 and is made by RCA. S/N 175. A rather rare version as it was made without the 200-500 kHz band. Full coverage in 6 bands is 1.5 to 18 MHz. It is in EC, - no mods, original dynamotor. No vandalising. Front panel refinished in wrinkle black per original, $480. **Shock mount for BC-348** receiver **FT-154** with power PL-Q103 plug attached, $190. **BC-348 Q receiver**, original condition with own dynamotor. No mods, no vandalising, $360. Packing and freighting extra. Photos emailed on request. Pete Williams VK3IZ QTHR jupete@bigpond.net.au

WANTED VIC

•**Transceiver** amateur bands 3.5 MHz, 7 MHz, 14 MHz, 21 MHz, prefer with SSB, outside antenna. **Course** material in written form for obtaining amateur licence and call sign, prefer with SSB. Bob Greenfield, 43 McMillan St, Morwell Vic 3840

FOR SALE QLD

•Cushcraft R7 vert, 10-40 inc manual, VGC. $250 ono. **TH3JR-S Tri-Band** and BN-86 Balun inc manuals GC $250 ono. Ph. 07 3356 9816 or email: tarah@powerup.com.au

WANTED SA

•**Diode matrix board for Icom IC-22S.** John VK5CJM, QTHR Phone 08 8531 2145 or melflo@austarnet.com.au

•**Dead Yaesu FT-270R** transceiver (or parts) in a condition which will allow me to replace the leaking LCD display in my otherwise working set. Jim VK5JST 08 8382 0504 endsodds@internode.on.net

WANTED WA

•**Ten Tec Omni C and external VFO.** Enthusiastic CW operator is looking for Ten Tec Omni C line Ð Omni C Tx/Rx (546C) with 500 Hz filter, external VFO (243) and power supply/speaker (255). Please contact me if you have any of the above. Steve Ireland, VK6VZ, Phone 08 9298 9330, email: vk6vz@arach.net.au

MISCELLANEOUS

•Is anybody driving to Brisbane from Sydney? Would pay 2/3 petrol costs for the trip if they would pick up one item of ham gear from Mulgoa 60 km west of Sydney. email briley@thehub.com.au, phone 0414 954 992 VK4ABZ

• **The WIA QSL Collection requires QSLs.** All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

About hamads....

- Hamads may be submitted by **email (preferred)** or on the **form on the reverse of your current Amateur Radio address flysheet.** Please print carefully and clearly, use upper AND lower case.
- Separate forms for **For Sale** and **Wanted** items. Please include name, address **STD** telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are prepayable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: ***newunltd@bigpond.net.au***

Postal: ***Newsletters Unlimited, PO Box 431, Monbulk Vic 3793.*** **Fax:** ***03 9756 7031***

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

ADVERTISERS INDEX

AEI 30
Andrews 9
Banelec ..... IFC
Camera Exchange 47
Com-an-tana 23
TET-Emtron 28
G & C 16
Icom ..... OBC
Ozgear 17
TTS 8
Small ads 55
VK Discounts 55
VK Books 25
Winlink 35
www.vk3ajj.com 55

Directory

The Amateur Service:

a radio communications service for the purpose of aalf training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: ★ **$ 75 for full members (F grade),** ★ **$ 70 for pensioners and students (G and S grade), and** ★ **$ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@charlot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

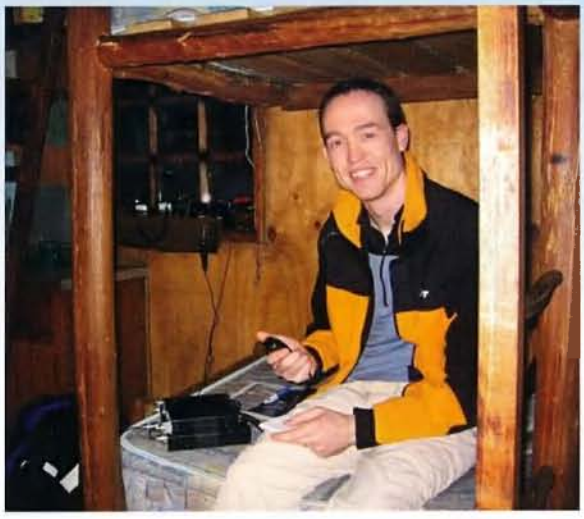
High country adventurers

Stephen Warrillow VK3JNH

The Bogong High Plains in the Victorian High Country is a picturesque place no matter what time of year. Every winter, this place is transformed by a blanket of deep snow and it is truly beautiful.

VK3JNH

VK3HFI on 80



VK3JPA on bunk

Cross-country skiing off the trails where one can enjoy the unique experience of skiing on virgin powder snow down unmarked slopes and gullies requires preparation, basic fitness and a sense of adventure. We have enjoyed exploring the Bogong High Plains for many years now with annual trips in summer and winter whenever we are able.

Amateur radio has, on each occasion, brought an added dimension to these adventures. From providing essential means of communication between party members on the trip and family at home, to acting as a back up means of emergency communication in this isolated region, portable and hand-held gear has played an important role on each trip.

Extended back-country cross-country skiing trips necessitate each member of the party to be self-reliant. All food, clothing and equipment must be carried in a rucksack while skiing through what can be fairly rugged terrain.

See page 12 for the story of the Alpine adventure of Stephen Warrillow VK3JNH (author), Gerard Warrillow VK3JPA (photographer), Matt VK3HFI, Brendan M, Matt W, Steve V. and Lindsay

ICOM'S GREAT CHAMPIONS

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706

Now includes 70cm @ 20W and 50W on 2m Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

IC-2200H

High (65W) Power Output • DTCS & CTCSS Tone Squelch • DTMF Encode & Decode (with optional UT108) • Digital Voice & Data Communication (with optional UT118 • 207 Alphanumeric Memories

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch • Detachable Front Panel standard (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied: HM133.

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495 KHz - 1 GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

ICOM

find your nearest ICOM dealer at

www.icom.net.au or (03) 9549 7500

Volume 73 No 10
October 2005

Amateur Radio

$6.50 incl GST

WIRELESS INSTITUTE OF AUSTRALIA

The magazine for AUSTRALIAN radio amateurs

DXing Lighthouses in VK2 & VK4

Review bhi digital signal processing units

- A simple-to-make dipole for HF bands
- An automatic knob twiddler for the 40m CW band
- The development of radios in the Flying Doctor Service. Part 3
- Fuses, or how to get a smaller bang for your buck!
- Radiated power
- The Ten Tec Orion is different!
- Working DX 16 metres above the Indian Ocean

9 770002 685109 10

BENELEC

YAESU

A Portable for All Situations.....

... with a BONUS!

Clearance Item*
VX-1

2m / 70cm
$310.20

VX-2

2m / 70cm
$343.20

Clearance Item*
VX-5

2m / 6m / 70cm
$441.70

VX-6

2m / 70cm
508.00

Included with These Models

FREE
Soft Hook Ear Plug
with inline Mike & PTT

Value $68.00

Clearance Item*
VX-150

2m
$227.70

Included with These Models

FREE

Value $68.00
Speaker Mike
with CT91

VX-7

6m / 2m / 70cm
$695.00

FT-60

2m / 70cm
$375.90

VX-170

2m
$290.80

***While Stock last**

All Price icludes GST

Benelec Approved Amateur Transceiver Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosund.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
vk3my@bigpond.net.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

Ozhelp Services
Tel: 07 3273 7263
sales@ozgear.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8285 2400
brenton@posnav.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 10
October 2005

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

The development of radios in the Flying Doctor Service. Part 3 10
Rodney Champness VK3UG

Working DX 16 metres above the Indian Ocean 18
Graham Rogers VK6RQ

Green Cape Light 2005 19
Ken Robertson VK3HKR

The International Lighthouse and Lightship Weekend 20
Ron Brumley VK4FC

Celebrating the ITU's 140th birthday 25
Barry Robinson VK3JBR

TECHNICAL

Small vhf beam: performance and maintenance 4
Felix Scerri VK4FUQ

A simple-to-make dipole for HF bands 5
Hayden Honeywood VK7HAY

An automatic knob twiddler for the 40m CW band 6
Joe Rotenberg VK3BBN

Fuses, or how to get a smaller bang for your buck! 13
Clive Wallis VK6CSW

Radiated power 15
Bill Isdale VK4TWI

The Ten Tec Orion is different! 22
Martin Luther VK7GN

Review: bhi digital signal processing units 26
Eric Buggee VK3AX

Heavy duty standoff insulators for ladder line (Technical abstracts) 51
Peter Gibson VK3AZL

COLUMNS

ALARA 36
AMSAT 37
Awards 34
Beyond our shores 50
Contests 41
Directory 56
DX News & Views 43
Editorial comment 2
Equipment Review 26
Hamads 54
HF predictions 52
News from... 30
VK2 30
VK3 30
VK4 31
VK5 31
VK6 32
VK7 33
Over to you 40
Silent keys 9, 40, 44, 47
Spotlight on SWLing 35
Technical Abstracts 51
The things we do 19, 20, 21, 48.49
VHF/UHF – an expanding world 45
WIA comment 3
WIA news 4

Our Cover this month

It's the season for Lighthouse activity. See the stories of 2 DXpeditions on pages 19 and 20. Cover picture is from Ron Brumley VK4FC

Contributions to Amateur Radio
Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues
Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies
When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer
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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

Judith Oliver	Office Coordinator
Emma Treblico	Examinations Officer
Brenda Edmonds	Office Assistant

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
Assistant Treasurer	Bruce Bathols	VK3UV

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	Glenn Dunstan	VK4DU
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glenn Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

Secret Camp

Please note that the author of the Secret Camp radio article had not informed me there were two radios, one from the men's camp which the article covered and another in a pretty box from the women's camp. The pictures showed both.

Are we boring you?

I have received a letter complaining about the boring content of AR. The listed subjects were rare DX, QSL card collecting, ridiculous pointless contests and Morse code. The problem is that this is what a lot of amateurs still participate in and get great satisfaction from.

However the writer goes on to say AR needs to cater for other areas like 2.4 GHz digital networks for data transfer, a narrow specialist area which a lot of people including amateurs participate in but no one thinks to write an article on and send it to AR.

There was also comment on amateur equipment that was available overseas, which was not for sale in Australia. This fails to consider whether we have problems with the equipment meeting our licensing requirements and what the possible market for the equipment is. The author also felt it was the WIA's job to convince manufacturers that they should import certain equipment. Sorry but that is not a function of the WIA. The WIA relies on volunteers to do most of its administrative jobs; there are two paid staff in the National office but no technical staff. The WIA does not have the resources of the ARRL or the RSGB so there are lots of things the WIA would like to do but it does not have the resources to do.

So if any group of amateurs feels that *Amateur Radio* magazine does not cater for their needs please get someone to write an article and then I can publish it and help promote the activity.

Further, AR is more a journal of record of the past with some news of the future but, if you want the WIA views on a topic, you do have to go to www.wia.org.au that carries all the current news on topics of concern to all amateurs.

New assessors

The first round of training of assessors for the new licence assessment process has just about been completed. The ACMA should have published the new LCD and other information to introduce the new licence structure by the time you receive this issue of AR.

So we stand at the door of an important new stage in amateur radio in Australia. If we wish our hobby to survive, then we need to a new generation to join us.

However we have to continually remember that times have changed. The initial licence is now aimed at getting new operators safely on the air using "modern" equipment and operating it responsibly. It is then up to the body of amateurs they come in contact with to encourage them, nurture them, mentor them into the greater levels of competency required to properly enjoy the wide range of technical challenges and modes of operation we can use today.

Things are a lot different from when I got my licence with AM or CW modes and a Morse code test at 12 words per minute. (What was this SSB? Let alone today's PSK31 and WSJT JT 65.) So if we want to be able to sell amateur radio as a hobby with community service skills,we need to encourage new amateurs with today's skills and ensure they learn how to overcome the technical problems of setting up an amateur radio station and being able to operate it using the modes they want to.

My best wishes to those who sit the first Foundation Licence assessments and my thanks to all those who have volunteered their time to make this possible.

LONG LIVE AMATEUR RADIO.

73 Colwyn VK5UE

This month:

Oceania DX Contest 2005

(SSB) 1 – 2 October,
(CW) 8 – 9 October

WIA Comment

WIA President Michael Owen is currently on a well earned break. This months WIA comment is from Director Phil Wait, VK2DKN.

The incredible complexity of WIA

As a relative newcomer, I am struck by the incredible complexity of WIA and the many diverse functions it performs for members and amateur radio generally.

Many, larger commercial organisations are simpler. WIA relies solely on volunteers and two busy staff members. I will use this space to give updates on the most important recent events and our general activity.

With the activation of the Aurora 'Broadband over Power Line' (BPL) trial in Hobart, WIA has been strongly lobbying ACMA. 'Aurora' is a commercial trial with paying customers in a suburb with no existing broad-band provider. It is designed to determine the uptake and viability of such a service.

Prior to Aurora de-activating the part of the system causing interference to a local amateur, the level of interference from the new 200 Mbps DS2 based equipment was similar to that of previous trials, using older 45 Mbps technology, in Queanbeyan and Moruya, NSW.

It is claimed the new 200 Mbps technology has lower interference potential than the 45 Mbps technology. Observations suggest that if it's any lower, it's not much lower.

There was wide media coverage of Aurora, touting the benefits of BPL, with a surprisingly little about its obvious shortcomings. WIA quickly expressed its concern to the various media organisations about the lack of research evident in their one-sided coverage. We are expecting more balanced reporting.

At a recent meeting with ACMA in Melbourne, we strongly put to them that 'they must do something' or have their regulatory position 'white-anted' by the increasing number of Access BPL trials, and a potential flood of In-Home BPL modems into the country.

As was the case with 433 MHz Low Interference Potential Devices (LIPDs), regulation too late is just that – too late.

We have asked ACMA's acting Chair why ACMA are not enforcing their own BPL trial guidelines, WIA again forcefully expressed its belief that the trial guidelines are deficient, and certainly ineffective if not enforced. Our lobbying is continuing and, I believe, partly due to the quality of our submissions, is having some influence.

Attending Standards meetings is an important WIA activity, our 3-person Standards team has attended many such recent meetings. Changes, proposed or actual, such as allowing BPL systems or setting limits for RF exposure to humans, are frequent in EMC and other standards. Our work on Standards committees ensures that WIA is aware early of issues affecting amateur radio. As a stakeholder we have influence in Standards development.

A huge undertaking is the changes to amateur service licensing and amateur service examinations. By late September we expect to have the first batch of Foundation Licence candidates qualified and waiting for the final approval of the new 3-tier licence structure by ACMA.

The new licence is probably the biggest change in amateur radio since the introduction of the Novice licence grades in the late 1970s. We hope the Foundation licence will attract significant numbers of new enthusiasts to guarantee the social relevance and future strength of amateur radio. We expect ACMA to approve the necessary regulatory changes at their board meeting this month.

A strong WIA membership is essential to maintain these many diverse services

A small, dedicated team of people worked with ACMA to develop the new licence structure and the syllabi, they have completely re-engineered the WIA examination service.

The WIA introduced a new 'assessment of competency' system for the new licences, using WIA Assessors to mark examination papers and also provide a practical assessment. These Assessors are qualified and registered by a Registered Training Organisation (RTO) accordance with the Australian Quality Training Framework, and are registered by the WIA as a WIA Assessor.

By now some 80 people will have attended training courses, and a further 26 people have applied to be accredited and registered on the basis of existing current qualifications. As of now, we expect to have well over 100 accredited and registered WIA Assessors nationwide.

Accredited means they are accepted by the WIA as assessors based on training qualifications; registered means registered by WIA for a period, after which they are audited for re-registration.

This is a phenomenal effort by all involved and I particularly acknowledge the work of Ron Bertrand of the Radio and Television School, and Fred Swainston of TrainSafe Australia. Their efforts have been truly Herculean.

A new Foundation Licence Manual, entitled *"Your Entry into Amateur Radio"*, is well into production; this high quality publication will be available through newsagents and WIA registered clubs. It will take prospective amateurs through the Foundation Licence syllabus and will be a valuable marketing tool in attracting new entrants to the hobby.

Work continues on the many other WIA functions and member services.

The *2006 Call Book* is now in production with additional information on the new licence grades and WIA examination services. The Intruder Watch Service is modernising and has been actively tracking interference to HF amateur services from Over-The-Horizon-Radar and others. New Amateur radio DXCC and other awards have been introduced with spectacular new award certificates to grace the shacks of dedicated DX'ers and contesters. Preparatory work continues for the vitally important World Radio Conference WRC07.

For its size, the WIA is indeed a very complex organisation. A strong WIA membership is essential to maintain these many diverse services, and to provide strong representation for Australian amateur radio.

'Has the WIA met your expectations? I hope so. If not please let us know, and if we have met them, please let somebody else know.

ar

Small vhf beam: *performance and maintenance*

Felix Scerri VK4FUQ

The general text of this article might be self-explanatory. However, a recent bout of fault-finding has made me realise that some obvious things tend to get missed, resulting in unnecessarily reduced antenna system performance.

Here in Ingham, I use a small homebrew Yagi to increase my general 2 m communications range. Our "local" 2 m repeater is in Townsville, around 70 road miles south, but not a very clear radio path (although a fair bit of it is over water), and a small beam is needed. I use the five-element version of my two "strip" Yagi designs that were featured in *Amateur Radio* in June 1996.

Recently I've noticed a gradual reduction in 2 m signal strengths, and decided to do a little antenna fault-finding. The results have been instructive. As you might guess, excessive coax cable (RG213) line loss was the biggest part of it, presumably caused by water ingress (rain!). As much as coax cable is a very useful feedline, water has a way of getting in and finding its way along the coax cable. The cable loss rises dramatically, and the feedline becomes worthless. The answer is to properly seal all potential points of water ingress. This can be a little messy, but it is well worth it! RG213 is not cheap!

Most amateurs are familiar with the butyl rubber products designed for this purpose. I had used ordinary insulation tape to waterproof the PL259 plugs. Not very effective. I now have several rolls of self-amalgamating tape!

Another observation was the loss resulting from excessive line length. It does pay to keep things as short as practicable. Even on 2 m, general line loss is a potential problem. The thicker, more "heavy duty" 50 ohm coax cables (eg. RG213) are mandatory.

Related is line matching. Line loss is minimised when properly matched at the load. It is worth tweaking up the gamma match or whatever matching system one uses, for the lowest SWR. For accuracy, use a quality SWR meter designed for the desired frequency range.

A final observation relates to antenna gain. Once the feedline problems were corrected, I tried switching from my reference five element to my favourite "portable use" beam, the three element version of the VK4FUQ "strip" Yagi. In theory, a five element Yagi should be better than a three. In terms of gain, this is so! In my tests the superiority of the five element over the three was clear, although the difference should be only around 2.5 dB. Every dB is worth it!

Also, the antenna polarisation is most important. This aspect is obvious, depending on the "modes" one uses (eg. repeater operation requires vertical polarisation). Remember too, if mounting the Yagi "vertically", use a non-metallic support (eg. wood), if the mast is running "through" the line of the elements.

Related to this is "level". During some of my tests, due to the mounting arrangements used, I found the beams were "looking" slightly skyward, although pointing in the appropriate azimuth direction. Despite what one might think, even on a distant and elevated radio "target" such as a repeater (where a slight upward tilt could possibly be considered useful), I found that signals were always strongest when the beam was pointed accurately in the target direction, with the antenna boom strictly horizontal.

Is all this commonsense?

ar

WIA news

Due to a layout error part of this item was omitted in last month's AR

WIA appoints National QSL Bureau Coordinator

The WIA undertook as part of the transition from a federal to a national structure to provide a QSL service at no charge to its members. The WIA Board has formulated a policy which continues to rely on existing individuals and groups, achieving economies of scale by concentrating outward QSLs through the Westlakes club.

The Board decided to appoint the existing VK6 QSL manager, Neil Penfold, VK6NE to fill this position. The Board felt a dedicated manager is required to manage and promote this aspect of the WIA's commitment to its members.

Neil's duties will include:

- Ensure all stakeholders are fully informed and understand the respective roles required to deliver the WIA's QSL commitment;
- Coordinate the activities of all in relation to outward QSL services;
- Ensure that the QSL service effectively meets the needs of members in a cost efficient way;
- Develop improvements to QSL service;
- Maintain an overview of the financial aspects of the service;
- Promote the WIA QSL service as a benefit of membership, and publicise how to use the service;
- Improve and update the part of the WIA website relating to the QSL bureau;
- Respond to questions relating to QSL services;
- Identify and overcome shortcomings in the provision of services;
- Be the focal point for matters relating to the provision of QSL services by the WIA;
- Provide information and advice to the WIA director responsible for QSL services and to WIA Board
- Report as requested to each Open Forum or other meeting following each Annual General Meeting;
- Undertake other tasks relating to the provision of QSL services as requested.

The QSL manager is appointed by the Board after each AGM.

Neil can be contacted at qsl@wia.org.au

ar

A simple-to-make dipole for HF bands

Hayden Honeywood VK7HAY
Email: hhoneywood@huh.tas.edu.au or honeywoodnrs@bigpond.com.

Are you a new amateur radio operator, or a current one that has been inactive for a while and wants to know how to get onto HF quickly? Then here are a few basic antenna designs to get you started.

Firstly, to make a dipole you need to know the measurements and have the materials to construct one. I have written out a list below of the most common things you will need to find around the place.

- A length of wire - depending on what dipole you make depends on how much wire you will need. The wire can be either insulated or bare.
- 3 insulators or more, depending on how many dipoles you are going to make. Some plastic water pipe will work.
- One or more poles or towers to support the dipole.
- Coaxial Cable - for HF, RG58 C/U would suit, if the run of coax is not too long (you lose about 0.7dB at 3.5 MHz for 30 metres). RG213 Coaxial would have a loss of 0.4dB over 30 metres at the same frequency.
- A bit of rope or something similar to tie from the insulator to a post or support in the ground.

To calculate the length of the wire you need, grab a calculator and work out this sum below.

468/Frequency (in MHz) = length in feet

142.65/Frequency (in MHz) = length in metres

E g: If we are going to make a dipole to be resonant on the 80 metre band and we want to know how long it has to be, calculate the following.

468/3.5 = 133.714 feet.

142.65/3.5 = 40.76 metres

Of course if we are going to use our dipole for all modes on the 80 metre band, we would calculate the length for the middle of the band so that we get the best VSWR reading on both sides of centre. Therefore, if we wanted to make our dipole for 3.6 MHz, the length would be:

468/3.6 = 130.0 feet

142.65/3.6 = 39.63 metres

Plus, say, 40 cm or 16 inches for attachment to the insulators. Cut the wire exactly in half. You now have two pieces of wire approximately 19.8 metres or 65 feet long. Now get your centre insulator and drill two holes in it, one at each end. Strip or prepare about 5 cm from one end of each wire and pass them through the holes in each side of the centre insulator and twist the wires together. Solder the braid of the coax to one side and the centre conductor to the other side. Prepare the other ends of each wire and do the same at each end insulator that has also been drilled. Your dipole should now look like Figure 1.

You can feed a dipole with either 75 ohm or 50 ohm coaxial cable, but 50 ohm is more common as most rigs are designed to work into a 50 ohm load. When mounting your antenna, you may want to mount it so that it better matches whichever cable you are using.

For 75 ohm coaxial cable, mount the insulator on pole and have elements suspended straight so that the antenna and cable form a 'T' Shape.

For 50 ohm coaxial cable, mount the insulator on a pole and bend the elements down at 45 degrees so it looks like an upside down, or inverted, 'vee' shape.

The reason we slope the elements down at 45 degrees is to lower the feed-point impedance closer to 50 ohms. A normal straight 'T' dipole has an impedance closer to 72 ohms.

Our dipole is now finished and ready to operate. Just attach a PL259 plug or whatever fits to the coax cable and connect to your rig.

Well I hope you have success with your dipole. If you have any problems just email me at hhoneywood@huh.tas.edu.au or honeywoodnrs@bigpond.com.

ar-

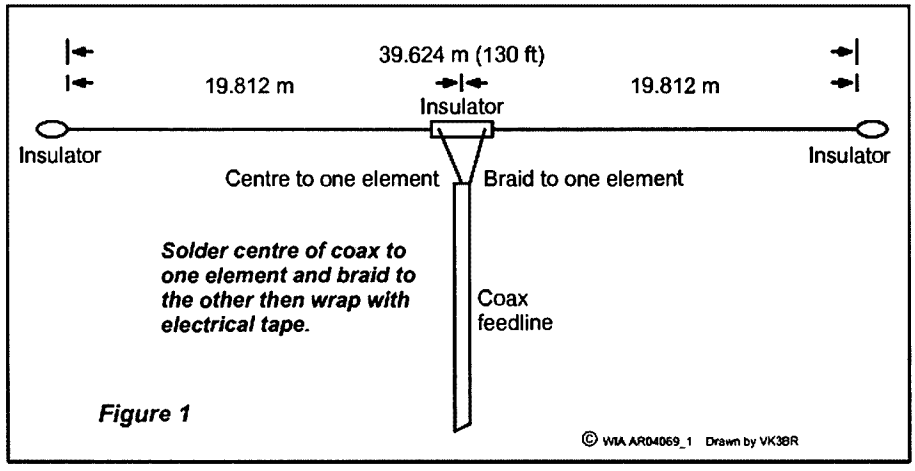


Figure 1

An automatic knob twiddler for the 40m CW band

Joe Rotenberg VK3BBN

As it often happens these days, the amateur bands, particularly the CW sections are dead for much of the day. In the hope of getting a contact, I have therefore spent a lot of time twiddling the knob backwards and forwards, hoping that someone might appear and talk to me. This is rather a boring activity.

To solve this problem I present an "automatic knob twiddler"; a receiver which tunes backwards and forwards automatically leaving me to do something else in the meantime. When there is a signal, a "whistle" appears in the speaker; I know that someone is around and I can switch on the main transceiver and work him.

This particular model is for the CW end of the 40 m band, though I cannot see why the idea cannot be made to work on other bands and segments (although I haven't tried it on the other bands).

Principle of operation

A block diagram of the circuit is shown in Fig 1. We see it is just a standard receiver, but with electronic tuning instead of a knob. This electronic tuning is then controlled by a sawtooth generator. Thus the overall effect is the same as if there had been a knob and this knob had been twiddled to and fro.

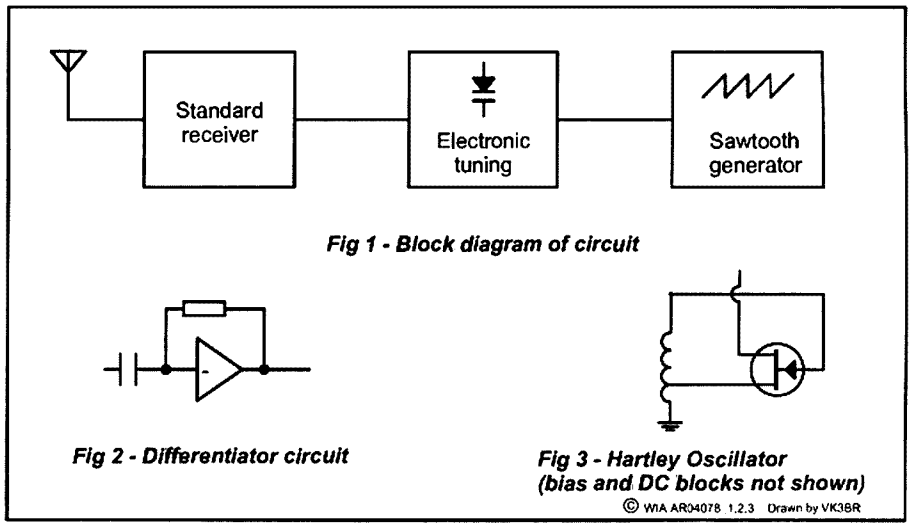
Some comments on the circuit.

The receiver

The receiver is a direct conversion type lifted holus bolus from a published design [1]. I have made some modifications, most of which are too minor to be worth commenting on, but two items deserve mention:

The audio amplifier

In the original circuit, an audio amplifier stage is given as shown in Fig 2. This is actually a "differentiator" circuit and is rather liable to take off. The reason for this is that op amps such as the 741, LM358, TL084 and many more are "internally compensated" to make them tame when feedback is applied to them. This is achieved by making them behave



Figs 1,2,3

(past a certain frequency) as integrators. [Why an integrator should in fact be tamer than a straight through amplifier is actually an interesting topic, but I don't want to digress; interested readers are invited to write to me.]

At any rate, making the circuit behave as a differentiator cancels this integrator effect and the circuit is then prone to instability like the "uncompensated" op amps like the old 709. I have therefore put a resistor in series with the capacitor so that the circuit is only a differentiator at low frequencies. Higher up, where the capacitor acts as a short circuit it is just an ordinary resistor-resistor feedback network, and quite stable.

The oscillator

The original oscillator uses the standard Hartley arrangement with the tapped coil as shown (without bias and blocking capacitors) in Fig 3. It should be noted, however, that there is no reason for the two sections of the coil (the bit

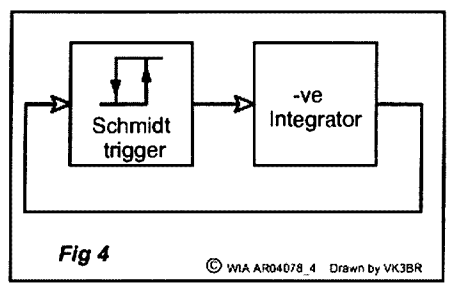
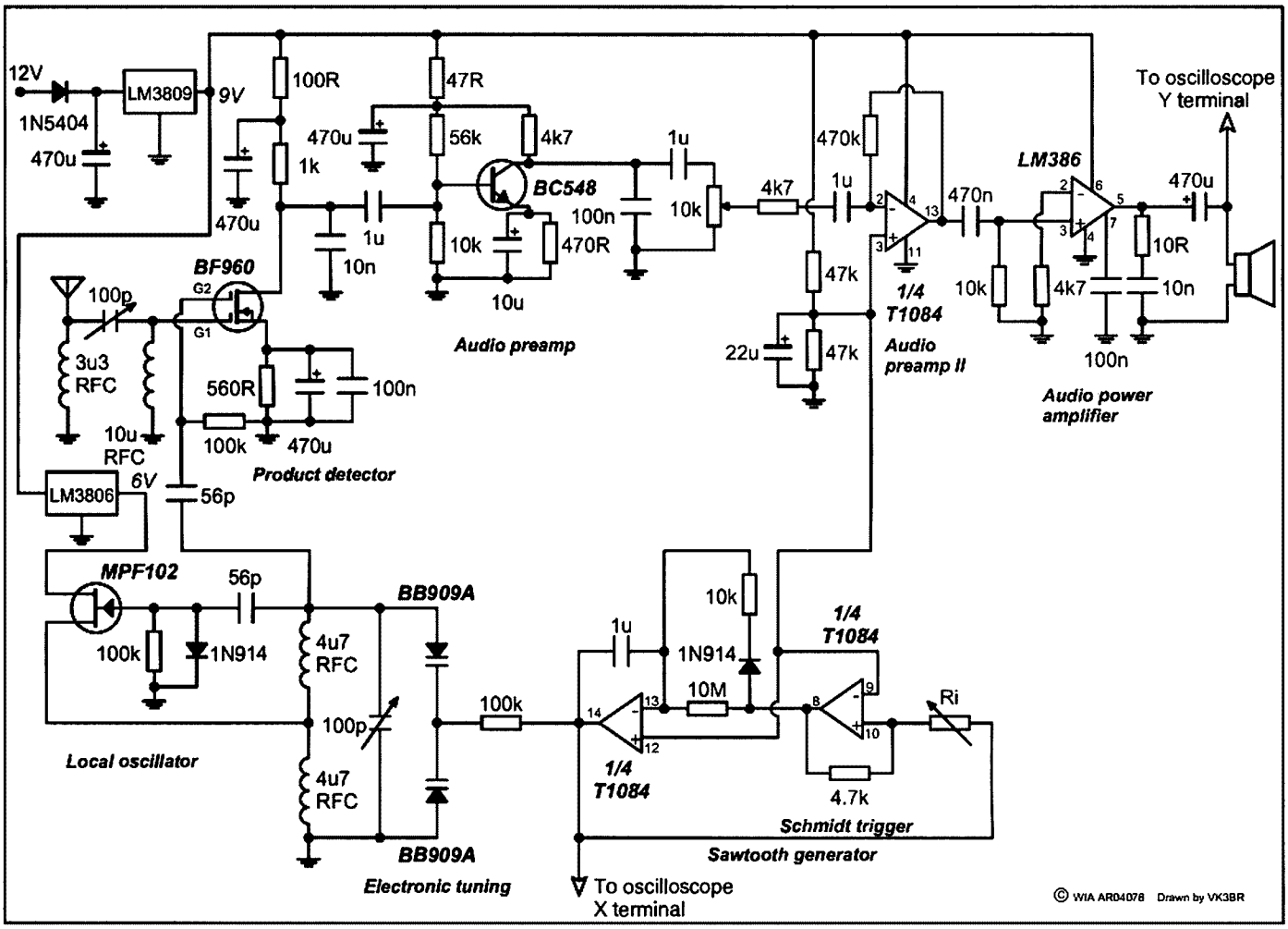


Fig 4 – Sawtooth generator: block diagram.

below the tap and that above) to be magnetically coupled: it's just like this for convenience; to save having to have two coil forms.

When the two sections are not coupled, then the circuit is equivalent to a Colpitts circuit, although with inductors instead of capacitors. But it oscillates just as well. In the present design, I have used two RF chokes in this "uncoupled" idea to save myself the bother of winding coils.



Schematic of the VK3BBN Automatic Knob Twiddler

The electronic tuning section

The electronic tuning section is just the standard back to back diode idea found in many electronics textbooks. I have used a pair of BB909a's just because they happened to be in the shop, but I don't believe there is anything special about them. I expect almost any diodes, whether intended for variable capacitor service or not, would do.

The sawtooth generator

This is a rather ingenious circuit shown to me many years ago by Associate Professor Arthur Ferguson, and unfortunately I don't know whether to credit him with its invention or if it is someone else's.

It can be broken down into the block diagram of Fig 4.

As the integrator reaches the switching point of the Schmidt trigger, the input to it changes polarity and so does the direction of the ramp.

The purpose of the diode is to make the sawtooth asymmetrical (ie it ramps down much faster than up); if a triangular wave is desired it is left out.

Note that the feedback on the Schmidt trigger op amp is to the + input. This is correct in order to get the hysteresis effect.

The variation in the output is set by the sensitivity of the Schmidt trigger; the more sensitive, the smaller the "wiggle". This is set by the trim pot Ri.

Construction

Each builder has his own pet construction method. Mine is to

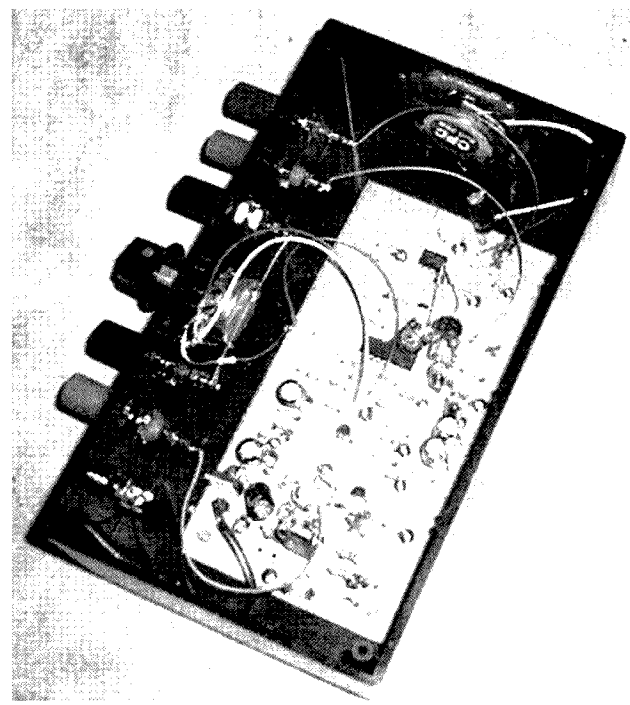


Photo 1 – Inside the case of the Automatic Knob Twiddler showing the component side of the circuit board.

assemble everything on an etched double-sided printed circuit board, with the topside just a ground plane.

I find I can never get it right first go, so rather than make another one, out come the tinsnips and a bit of rats' nest construction above it.

Then put it in a (in this case plastic) bought box.

Parts

All the parts should be fairly easy to obtain except possibly the BF960. However, as far as I am aware, it is still in full production. I got mine from Rockby Electronics (Melbourne).

Cost

The cost of the entire project including the box, the printed circuit board and all plugs and sockets, using all new components is around $60.

Tune up

To tune the circuit up:

(i) Switch it on, make sure nothing gets overly hot, and that there are healthy noises coming from the speaker.

(ii) Check that the oscillator is working. Tune the trim-pot Ri so that it is short circuited (so that the output of the sawtooth will vary as little as possible), and try and pick it up on the station receiver.

(iii) Tune it to the right frequency. Wait half an hour or so for it all to stabilise. Turn the station receiver to the middle of the band of interest (in this case 7015 kHz, being in the middle of the band 7000-7030 kHz) and very gently adjust the oscillator trimmer (you will find the tuning extremely sharp!) until the oscillator is heard again.

(iv) Peak the front-end trimmer for maximum signal. It might be necessary to alternate (iii) and (iv) a couple of times. Use a "tweaking screwdriver" with a plastic shank.

(v) Expand the tuning so that it goes back and forward over the entire band. Very gently, and a little bit at a time move the tuning of the receiver up a little and increase the setting of Ri, until the oscillator can be heard "whooping" across. Continue this procedure until you reach the band edge, 7030 kHz, or maybe a little further, for good luck.

(vi) Tune the receiver to the other band edge, 7000 kHz, and check that you can hear it whooping there. If not, increase Ri slightly.

That's all. You can now turn off the main receiver and listen to the "knob twiddler" If there is a signal within the band segment, you will hear a "whoop" as the tuning of the set sweeps across.

You can also connect an oscilloscope and look at the band occupancy. This is shown on one of the photos.

Final comments

I should be very interested to hear from readers who have tried building this circuit or who have any other comments. Write to me at GPO Box 789, Melbourne, 3001.

Reference:

[1] De Maw, Doug, "W1FB's QRP notebook", ARRL, 1991, p 72 and p 70.

ar

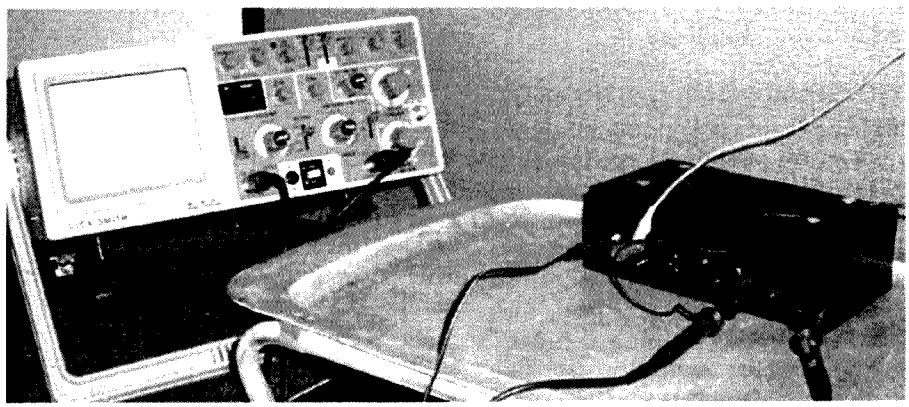


Photo 2 – The Automatic Knob Twiddler in operation connected to an oscilloscope.

Silent key

Jack Henry Bell

Jack Henry Bell was born 7 March 1914 in Narrandera in country NSW. Jack was a remarkable fellow who led a full and active life achieving excellence in all that he did.

He began working life as a Postal Clerk delivering mail to the locals including a young Marie Bashir, (now Her Excellency Professor Marie Bashir, Governor of NSW), and went on to become Post Master.

Jack Bellwas the operator of an original AX Amateur callsign when he was a PMG Radio Inspector in Melbourne. Both Jack and his brother Francis (Now retired Father Frank Bell of Narrandera) had a strong interest in Morse Code and became original foundation members of the "Morsecodians" along with current President Gordon Hill of Sydney.

He operated a few callsigns under the original AX scheme but we do not know any specific calls.

Following his role with the PMG he did hold an amateur licence again

During WWII Jack was refused active service on all 3 times he volunteered because of his essential service and ability with Morse Code. He was involved with essential, official, and secret communications for the Australian Government as a Senior Signals Officer for the duration of the war..

Sadly Jack and his colleagues have not been formally recognised by the Australian Government for their essential service to their country during the war.

Having lived in several locations in NSW Vic and Tas, Jack gained a reputation as a problem solver and his prowess with the Morse key and flair for book-keeping led him to join AustralianMercantile Land and Finance Company (AML&F) with whom he worked until his retirement in Armidale NSW. AML&F were Australia's largest stock and station agents who were eventually taken over by Elders IXL in 1982 after more then 100 years continual trade. JackBellwas of declining health but enjoyed listening to the radio right up to his sudden but peaceful passing in the company of all his immediate family at Strath-Lea Nursing Home Armidale on 30 August 2005.

Jack Bell as a young man working for the PMG.

He is survived by his wife Pauline (Nee Bourke) their 3 daughters and several grandchildren and great grandchildren including grandson Phil Wright (former commercial radio broadcaster and journalist) ex VK2YPW and current operator of VK4YPW.

Submitted by Phil Wright VK4YPW

The development of radios in the Flying Doctor Service

Part 3: Continued development and the Morse typewriter

Rodney Champness VK3UG

Traeger now had a reliable pedal radio, but there was one problem he could not overcome: the abominable standard of the Morse code from some out-stations. However, he could have made it easier for these operators to send reasonable Morse by fitting side-tone to the transmitters like those fitted to most amateur transmitters that have a Morse code facility.

The sidetone oscillator would have involved using another low power valve, using slightly more current, with a little more circuit complexity, but may have saved the Cloncurry operator from having to ask for so many repeats. Even if this had been developed, some operators skills were so poor that even sidetone would have been of no help to them.

Traeger's fertile mind came up with the brilliant Morse code typewriter. The typewriter was connected across the Morse key terminals of the transmitter. To operate, the message was typed as you would on a typewriter or computer. The Morse code symbol, for whatever letter was pressed, was then sent out in perfect Morse code at around 10 words per minute. Due to a mechanical interlock, it was possible to press only one key at a time, which prevented sending garbled Morse code. The speed of the Morse code was regulated via an oil filled dashpot, which could be adjusted to vary the sending speed. The keyboard was similar in layout to the typewriter keyboard, with modifications to suit Morse code communications.

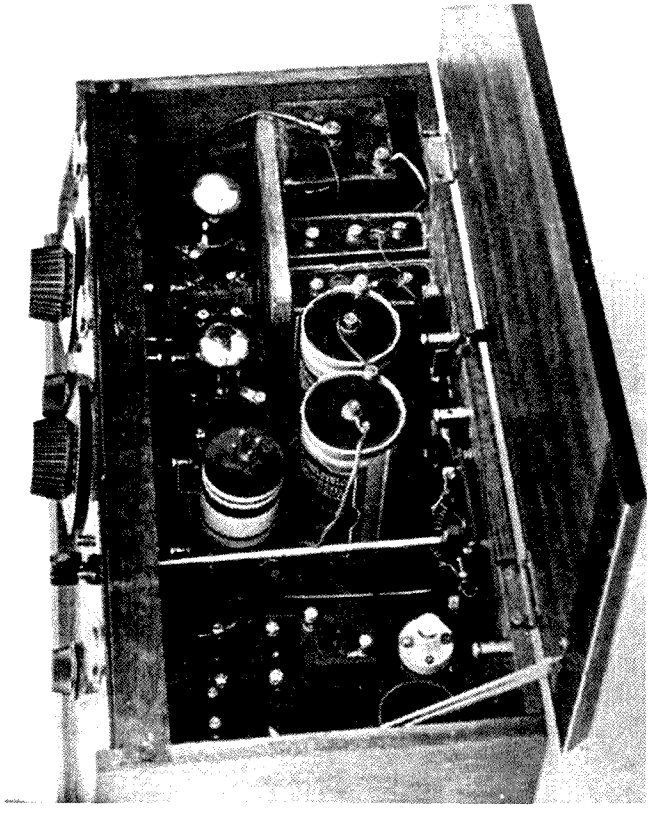


Photo 2. Inside view of the original "Pedal Radio", November 1928. Note the Tx valve missing at the bottom left.

The base station operator (Maurie Anderson) at Cloncurry must have thought his Christmases had all come at once with the advent of the Morse typewriter in 1931. The development of this Morse typewriter could be considered the communications computer of the 1930s. It is a very complex mechanical device, and if you are let near one DON'T pull it to pieces to service it - you may not get it back together again. This is the most innovative device that Traeger ever made. It shows sheer brilliance. There were 50 or 70 of these devices made, depending on the text that you read.

Improved Morse Code transceivers

Traeger designed and built various models of pedal radio, trying out different designs to improve the performance. One sub model did away with the dual transmitter as the single transmitter had proved sufficiently reliable. However, he improved the transmitter by arranging all the tuned circuits and the crystal for each frequency onto one large plug-in module. The counterpoise controls were retained in the transmitter, not on the plug-in module. To change frequency, this involved unplugging one module and replacing it with a module intended for the next frequency to be used. There was a difference in how the modules were wired, however. They were wired onto an eight pin plug and socket arrangement. Only six of the eight pins were used in each plug-in assembly. Three of the pins were used for the counterpoises, and a different pin was used depending on which frequency band was being used so that the correct counterpoise could automatically be connected on the socket in the transmitter.

Another model (34) used the same circuit as the 1930 model but the valves were changed. The receiver was equipped with three 30 valves, while the transmitter was equipped with two transmitters using the 33 tetrode valves. A set of this model is on display at the

RFDS base station museum at Alice Springs.

Another challenge was given to Traeger in 1933, the building of a completely portable transceiver. Padre Kingsley "Skipper" Partridge asked Traeger if he could build a unit that he could use while on patrol. It must do all that other homestead sets would do but be more robust and be capable of being slung across the back of a camel or a horse.

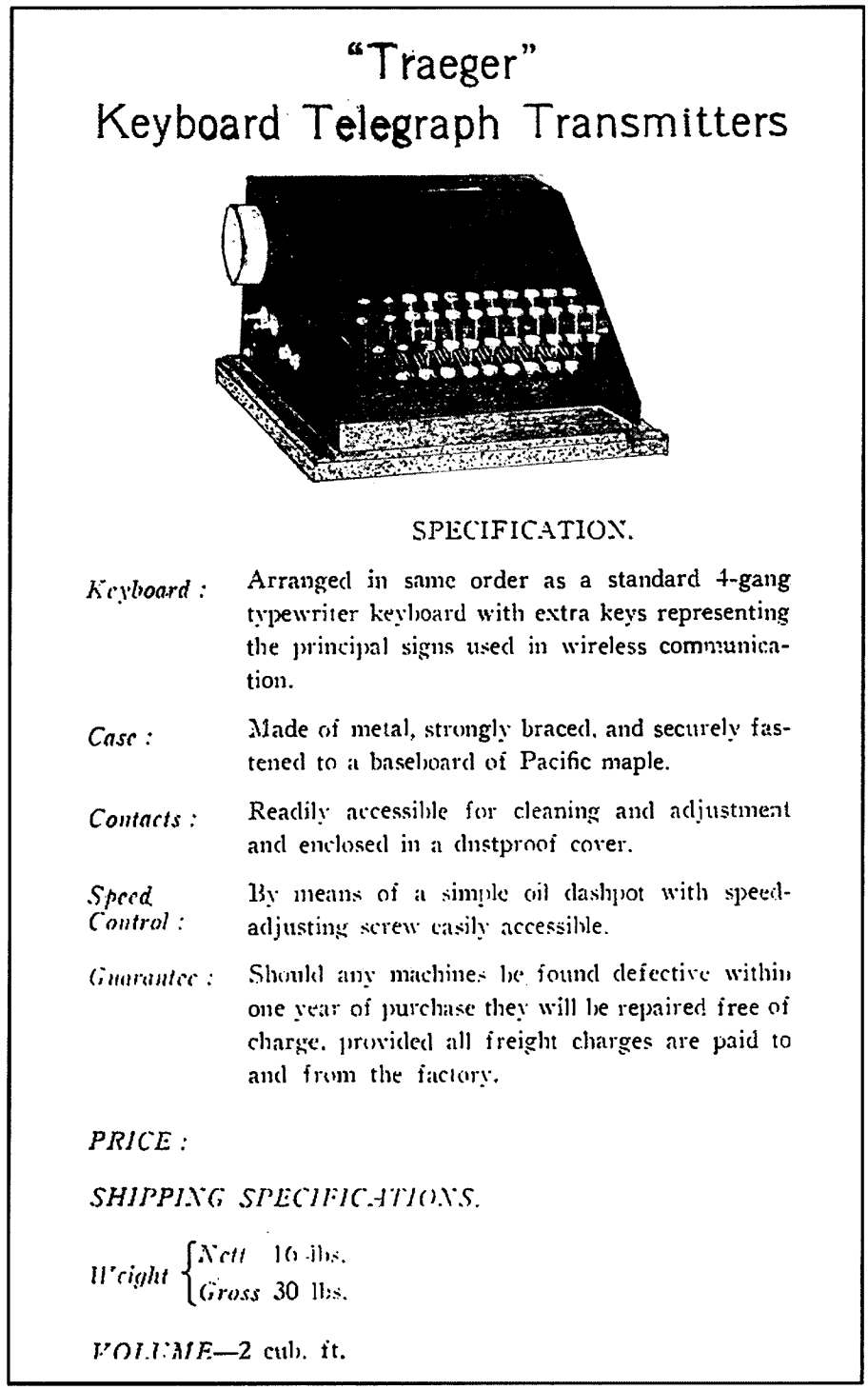
This was a formidable task for those times, just as had been the task of building the first pedal radio six years before. He had to "miniaturise" the set and put all the batteries, headphones, Morse key, aerial and counterpoise cables, transmitter and receiver coils, and the pedal generator pedals into the case. Traeger did some lateral thinking and decided that the radio could be built into two boxes, one that contained the set, and the other that stored or held the other items which completed the station, such as the pedal generator.

This was a purely Morse code transmitter with a receiver capable of both Morse code and voice reception. This was the first of the portable pedal radios. This set is no longer in existence as it appears from all the evidence available that it was replaced with an AM/CW transceiver in either late 1934 or early 1935. This later set appears to be a portable adaptation of model 35 design. It was built with a receiver similar to the 34 set mentioned above, using three A109 valves, but the transmitter has a PH233 (similar to 33) as the RF valve and a PH230 (30) and a 19 as the modulator for voice operation. The modulator was switched off when Morse was being used. This set is on display in "Adelaide House" in Alice Springs.

The advent of voice transmission

Early in the 1930s, better two volt filament battery valves became available for use in receivers. Traeger seized the opportunity to experiment with these valves for voice transmission. The 33 or variants of this valve became available in limited quantities in 1932. Experimentation proved that these valves were quite suitable for using in the transmitter RF output, and transmitters using them proved easier to tune compared to the earlier sets using triodes.

Valves suitable for audio use, which could be used as a modulator of the transmitter took a bit more finding. The 19 became available in reasonable quantities in 1934 and Traeger was able to experiment with them. The 19 was being used as the class "B" push-pull audio output valve for battery receivers. They were capable of over two watts with a high tension of 135 volts (design maximum). Traeger tried them with 180 volts and found that they worked quite satisfactorily as a push-pull class "B" modulator. However, the 19 was being considerably overloaded, drawing 20 milliamps standing current compared to 10 milliamps with only 135 volts on the plates. The transmitter valves had a relatively short life considering the fact that they were overloaded. While voice transmission was well catered for, no side tone was provided for Morse code operation. In fact none of Traeger's pedal



"Traeger"
Keyboard Telegraph Transmitters

SPECIFICATION.

Keyboard : Arranged in same order as a standard 4-gang typewriter keyboard with extra keys representing the principal signs used in wireless communication.

Case : Made of metal, strongly braced, and securely fastened to a baseboard of Pacific maple.

Contacts : Readily accessible for cleaning and adjustment and enclosed in a dustproof cover.

Speed Control : By means of a simple oil dashpot with speed-adjusting screw easily accessible.

Guarantee : Should any machines be found defective within one year of purchase they will be repaired free of charge, provided all freight charges are paid to and from the factory.

PRICE :

SHIPPING SPECIFICATIONS.

Weight { *Nett* 16 lbs. / *Gross* 30 lbs.

VOLUME—2 cub. ft.

Fig 4. An advertisement for the Morse typewriters.

radios with Morse capability ever had the sidetone facility.

The transmitter was capable of both operations so if radio conditions were poor, the out-station operators could switch from voice to Morse code.

The model 36 appeared during late 1935 or early 1936. The transmitter remained the same as the model 35. The receiver was considerably upgraded and became a much better performing set that was easier to operate. The RF stage was an RF tetrode type 32 with an untuned input. The regenerative detector also used a 32. The set only used one tuned circuit, and the receiver was able to tune from 550 kHz to around 10 MHz by using plug in coils. On the higher frequency ranges, a fixed capacitor was included in series with the tuning capacitor to band spread the tuning. This eased the task of tuning the receiver. The first audio stage was a 30 triode, which either fed an audio transformer coupled to a triode connected 49 valve and a loudspeaker, or a set of headphones. This receiver was a low battery drain variation of an ARRL design that appeared in QST for April 1929.

The advent of voice transmissions meant that the operators at various homesteads and out-stations could hear each other's voices for the first time. They wanted to talk to each other to overcome the loneliness. They chatted about things of interest to them, whether it be how the cattle were going or how the dressmaking was progressing. This informal chat session became universally known as the "Galah Session"!

With the improved out-station sets in use, perceptive people with innovative ideas saw that they could be put to other uses. On September 20th, 1950 the first experimental School of the Air program took place from the Alice Springs Flying Doctor Service (FDS) base. This was the brainchild of Miss Adelaide Meithke a retired inspector of Girls Schools in South Australia

Another more secret activity occurred around this time too. One gentleman and his lady friend conducted their courtship over the pedal radio. So that other users didn't know what was going on, their courtship was conducted via Morse code. If other out-station operators had realised that the courtship was taking place they would have learnt Morse receiving, not just sending!

Of course there was at least one third party who could easily read the Morse traffic and that was the base operator. However, base operators signed a Declaration of Secrecy, which forbade them to disclose the contents of transmissions that were not intended for their base station. However, the base operator would have occasionally checked to see that any "strange" signals were not from unlicensed stations!

The first superhet transceivers

Traeger was gradually developing additional models of pedal radios. In 1937 Traeger had the model 37 operating. This was in an all metal case, and was starting to look professional, whereas all previous sets looked very much like home constructed sets.

The 37 was the first set with a superhet receiver. The receiver used four 2 volt battery valves. It had a converter, one IF stage, a grid detector audio stage and an output stage with facilities for use of a speaker or a pair of headphones. The gain of the receiver was controlled by varying the screen voltage of the IF stage. It had no AGC. The band changing for both the transmitter and the receiver was by front panel switches as fitted to domestic multi-band receivers.

The transmitter had three plug-in transmitter modules selected by a switch. Should a set require to be fitted with a new frequency, Traeger had a module made and pre-tuned for the new frequency. It was then sent to the outback station and it could be expected to work once plugged into the transmitter. The only things at the out-station radio requiring adjustment after fitting the module were the length of the particular counterpoise (not always necessary if the frequency change was small) and the counterpoise tuning control. In some circumstances the antenna may have needed alteration.

The next step Traeger took was to provide a 6 volt vibrator power pack for the 37 set, which became the 37A. The days of the pedal generator were now numbered. The name "Pedal Radio" persisted for many years even when no pedal generator powered transmitter was still in use.

Further advances

Regrettably, the pedal radio transmitters were still quite low powered with around 1.5 watts output. It was quite low as the efficiency of small battery valves on HF is only around 40% in class C operation which is much lower than the 65 to 75% efficiency obtained from small transmitter type valves like the 807 or the 80 to 85% expected of large transmitting valves like the 4CV100,00E.

In the 1940s, the voltage from the vibrator power supplies was increased to around 240 volts, which really gave the valves a hard time. The transmitters had outputs of up to 3 watts - but with very reduced valve life.

Then around the time of the end of WWII, the first homestead station with a reasonable output was produced. It was the 45A20 that had an output power of around 20 watts from an 807. The modulator used a pair of 807s in push-pull. The reception between base and out-stations and between out-stations improved markedly and made using the flying doctor radio ("pedal radio") so much more enjoyable. These sets operated off a 12 volt vibrator pack and the transmitter valves were mostly 6.3 volt heater types, while the receiver still used 2 volt battery valves. The use of the battery valves enabled lengthy listening times without flattening the battery. The AC valves were more suitable in the transmitter as higher output power could be obtained and they were more efficient. As they were only used for relatively short periods, the much higher power usage was of no great importance.

With the improved out-station sets in use, perceptive people with innovative ideas saw that they could be put to other uses. On September 20th, 1950 the first experimental School of the Air program took place from the Alice Springs Flying Doctor Service (FDS) base. This was the brainchild of Miss Adelaide Meithke a retired inspector of Girls Schools in South Australia. The technical work was all done by Graham Pitts (VK6GF), the Alice Springs FDS base director. The experimental broadcasts proved that such a system would work, and it was officially implemented in 1951.

Many other activities and technical advances have taken place since then, with hybrid and then transistorised AM equipment, single side band (SSB), and

Fuses
or *how to get a smaller bang for your buck!*

Clive Wallis VK6CSW

A device used to detonate an explosive charge is called a fuse. In our hobby its namesake is a device used to protect electrical circuits. Not everyone seems to appreciate that the wrong choice of electrical fuse may lead to the "detonation" of the device it is supposed to protect! Electrical fuse technology is complex; fuse manufacturers' manuals are substantial documents. This article sets out a few thoughts on fuses and why the odd bit of wire will not do.

The electrical fuse is an expendable item that eliminates overload of a circuit. Use one with the wrong characteristics and you could find that the circuit is eliminated to save the fuse! I make no claim to be an authority on the subject but what follows has been gleaned from several reliable sources including the Standard Handbook for Electrical Engineers, 1987.

The role of the fuse is two-fold:

It should protect both the device being powered and the source of that power. The major electrical considerations in the choice of a fuse are source voltage and impedance, current required by the load, maximum current to be interrupted, and time needed to interrupt and clear the fault without equipment damage.

Fuses come in many shapes and sizes:

Rewireable, bolt-in, cartridge, glass or ceramic tube, for example. The rewireable type is found in older household AC mains fuse-boxes; here the likely option is to replace a blown fuse with the correct wire element, (although you can now obtain a re-settable plug-in circuit breaker). Bolt-in, large cartridge and tube types are generally confined to industrial applications and may be filled with air, sand, or a special filler such as boric acid or bone-fibre, etc. Such a sealed "company-fuse" (probably rated at 60 to 80 amps on a single phase inlet) can be found lurking near your electricity meter, but you interfere with it at your peril! Here we will concentrate mainly on the small glass or ceramic clip-in type found in amateur and domestic appliances, e.g., the 3AG (6.3 x 32 mm), M205 (5 x 20 mm), and similar.

What causes a fuse to blow?

Over-voltage, over-current, or overheating? Since the fuse melts, the last choice is clearly the correct one and occurs because the fuse element has a small but finite resistance. When too large a current flows, this resistance multiplied by the square of the current creates sufficient local heat to melt the fuse and interrupt the power. The essential requirement is that the fuse melts before the circuit elements do! The manner in which the melting occurs is important.

Except for rewireable fuses, which use tinned copper wire, fuse elements are generally silver strip or wire shaped to give the desired fusing characteristics. As the element melts an electric arc is formed and current continues to flow until this arc is extinguished, hence the "interruption time" is the sum of the melting and arcing times and is inversely proportional to the current. Where sand or another filler is used its purpose is to absorb the heat of the post-fusing arc thereby speedily extinguishing this arc in a controlled fashion. A blackened glass fuse cartridge indicates that ionisation of the air within the cartridge has occurred as a result of a prolonged and very hot arc. During the period of arcing and ionisation, current continues to flow and the fuse fails to interrupt the fault current. Such blackening should not occur if the fuse is of the correct type. Fuses can carry their rated current continuously; fusing or melting starts at around twice the rated current. Current carrying capacity is generally specified at 25 deg C; if the ambient temperature is higher then the fuse should be derated. To prevent nuisance blowing yet still have adequate protection, a fuse rated at 125% of the normal current is often specified.

Fuses are rated by current, voltage, and operating time or "delay"

Current ratings range from a few milliamps to many thousands of amps, while voltage ratings go from 32 to 600 for the common 3AG and similar types - and hundreds of thousands for special industrial types. Voltage classification depends upon the voltage present across the fuse after interruption. Always ensure that a mains fuse is replaced by

continued next page

The development of radios in the Flying Doctor Service *continued*

many other technological advances. For more in-depth information covering the development of communications (with emphasis on radio) and its use in the outback, from the time of the first settlement to now, I would recommend that you read my book "Outback Radio - from Flynn to Satellites".

The research for the book has taken me over six years, travelling through the outback and talking with those few left who know what happened, plus reading many manuscripts and books on the subject, and building and testing replicas of the transmitters. I was fortunate to have had time with the late Reverend Fred McKay who worked with Rev. John Flynn and was a padre with the Australian Inland Mission (AIM). He opened many doors to assist me in my research. Mervyn Eunson (VK4SO) had done extensive research over many years on the flying doctor service radio communications and was also of great assistance. Graham Pitts (VK6GF) was base director at the Alice Springs Flying Doctor Service base from 1944 to 1953 and then Port Augusta until he retired in 1987 (a total of 43 years with the Central Section of the RFDS). He has provided me with a considerable amount of very valuable information. Without the help of each of these people, my book and these articles would not have been able to be written with accuracy.

ar

a correctly rated one, not a 32 volt type. Most high-grade manufacturers stamp the voltage, current, and delay ratings on one metal end-cap though others use a code. To further confuse the issue there are three main standards used for small cartridge fuses, the American UL (Underwriters' Laboratory) plus the IEC and CEE standards found mainly in Europe and Asia. Because the detail of the standards varies, it is wise to always use a fuse identical to the original if at all possible.

Fuses must be able to safely interrupt the highest fault current which could be present at the rated voltage. The impedance of a standard 240 volt AC outlet may be as low as 0.1 ohm, in which case a dead short across it could result in an instantaneous fault current flow of 3400 amps - which can cause a very expensive bang. (Nominal mains voltage is 240 AC, hence peak voltage is 240 x 1.414 = 340; 340 V across 0.1 ohm = 3400 amps). Fuses come in two basic formats, the HRC (high rupture capacity) and LBC (low breaking capacity), and the 3AG type is no exception. Some HRC versions can clear a fault current of up to 10,000 amps whereas the LBC is rated at 10 times the nominal fusing current. (Here again, exact specifications vary with the manufacturing standard). That is, a 2 amp LBC type will safely interrupt no more than 20 amps. Superficially, the 3AG HRC and LBC fuses look much the same, but clearly the HRC type MUST be used where mains inputs are concerned.

Fusing speed is important and depends upon the nature of the required protection. Transistors and thyristors (three legged fuses?!) blow very quickly and require that the protective fuse blow even faster. Quick-blow types can act within half a cycle at mains frequency. On the other hand, motors, transformers, and capacitor input circuits pass heavy initial (inrush) currents and require slow-blow fuse protection. For example, the starting current of an induction motor may be three to eight times the rated running current. Repeated starts should not melt the fuse but the same fuse must give protection against internal shorts or over-current due to seizure or stalling. Placing a blob of solder in the centre of the silver fuse element increases the thermal capacity of the element sufficiently to withstand brief starting overloads, but a sustained overload melts the solder and dissolves the silver. One type of quick-blow fuse uses a specially shaped element designed to speed fusing by concentrating the heat in a small area. Some fuse elements have a coil-spring winding around part of the element; these are slow-blow types. Different applications require different fuse characteristics. A perusal of manufacturers' charts reveals a surprising variety of fuses available, many of which look outwardly similar.

In general terms, the fastest acting fuse is type FF (super quick) suited to thyristor circuits, while the standard quick acting fuse is rated F (normal blow). Type M has a medium fusing time and can handle small current surges, while type T is the standard slow-blow fuse. Type TT is a very slow acting fuse. Where no letter prefix is shown, such as 2A/250V the fuse may be assumed to be a normal quick-acting type. Where no voltage rating is shown, a fuse purchased locally may be assumed to have a 250V rating. As mentioned above, some fuses without a marked speed rating have a small spring or a solder blob on the wire; these are slow-blow types.

Fuse-holders should also be rated according to their design purpose and always make sure that the contacts hold the fuse tightly. A little unwanted resistance here plus a high current flow can lead to high temperatures and ultimate mechanical failure of the clip.

Because a fuse has some resistance, when a current flows through it heat is generated. The fuse element used in glass fuses usually has a positive temperature coefficient, which may make de-rating necessary to allow for the temperature rise. It also means that a fuse can suffer from thermal fatigue and may simply die of old age even though no equipment fault exists. Similarly, fuses have an "amps-squared-seconds" rating which is a measure of how much energy the fuse can pass and thus how much stress may be placed on the protected circuit before the fuse ruptures.

As well as fuses designed to protect against excessive current; there is also the thermal fuse to protect against excessive heat. These fuses are found in fan-heaters, hair-dryers, toasters, etc. and are designed to fail at a pre-set temperature. Replacement must always be by one of identical rating and it must also be positioned correctly to sense the heat. Just like glass fuses, they all look very much alike but have widely different characteristics. An improperly rated thermal fuse may cause a serious fire. Larger mains transformers often have a thermal fuse incorporated within the primary winding to protect against excessive temperature rise due to prolonged overload. Usually there is no economic way to replace this fusible link.

Quality fuses manufactured to UL, IEC, or CEE standards are required to show rated voltage, rated current, time delay characteristic, and the manufacturer's name or trade-mark. That being so, one can only wonder at the quality of many fuses sold at local outlets.

This article is not intended to be a comprehensive treatise on fuses If it makes you think twice about what sort of fuse you should use next time the need arises, then it has achieved its aim. Where possible, be guided by the equipment manufacturer's advice - he probably had good reason for choosing a particular type of fuse, and a fracto-buck spent on the right fuse could save mega-bucks on repair bills!

ar

Radiated power

Bill Isdale VK4TWI

We commonly measure power, often against some fairly arbitrary yardstick such as the rated output of a transmitter. Many high frequency radios these days are rated at 100 watts output, not because that is inherently good but just because it is what the market is looking for. Manufacturers presently deliver 100 watts as it represents the sweet spot at which consumers can be persuaded to open their wallets and buy the product.

Over time there will probably be the usual trend of bigger is better and manufacturers are likely to find that the demand for more power is there, as long as the price is not too steep. It isn't technically difficult to increase output power in a radio, it just increases cost, size and input power demand. But where is the power going?

Looking at a recently designed transmitter, we see an output of 100 watts and a need for 22 amps at about 13 volts to obtain that. Looked at overall, the transmitter can be viewed as a resistance and power calculated as the product of voltage in volts and current in amperes. The formula is P = E x I. It follows that, input power for the example is 13 x 22 = 286 watts. That is what needs to be coming into the radio in order for it to deliver 100 watts of radio frequency power at its output terminals. Where is the other 186 watts? It has been dissipated as heat and a careful touch of the heat sink will tell you just where it is going, out to warm up the world. Radio amateurs cause global warming; just keep quiet about that.

One thing is certain, we can't do anything about the heat loss in the radio, because some must inevitably result from the current flows and resistances in the device. The bright side of this is that we still get our 100 watts output and the power supply simply puts the energy into the radio as required. We can easily overcome the loss by pouring more power in from our power supply. We are not being wasteful as the overall loss in the radio is the least that modern engineering can make it.

From the output terminals of the radio, the loss is much more within our control, subject to practical constraints that will probably mandate some compromises. The transmission line to our antenna will have some loss. In a transmission line which ends at an antenna presenting a pure resistance equal in value to the characteristic impedance of the line there won't be any voltage and current variations on the line, and no standing waves, so there will be very little loss of signal energy as it is not reflecting back and forwards within the line, piling up into standing or stationery waves. There will be some loss due to resistance in the copper, but with a line that has big conductors and is as short as possible, the loss will be minimised.

This is all great in theory, but in practice it soon goes awry. If we use an antenna, such as a dipole, then it will present a 72 ohm impedance if it is perfectly situated, giving a standing wave ratio of 72 divided by 50, or about 1.4. That is quite good and our transmitter and feed line, optimised for a 50 ohm working load, will still perform well.

If we are using a quarter wave vertical then, if it is sitting on a perfect artificial ground plane, it should present a 36 ohm load, half that of its bigger brother the dipole.

In most situations there will be some practical constraint that interferes with the ability of the antenna to radiate as it would in theory. Often there will be some nearby tree or structure or it will not be possible to raise the antenna as high as we would wish in order to get it clear of the influence of the ground.

The efficiency of our antenna will be reduced by proximity to the ground or objects that will unfortunately become a part of the total antenna system, a part that operates adversely and is acting as an air cooled dummy load.

I am not going to discuss trees or houses other than to say that they may be useful supports and that the direction of radiation should be as far from them as possible. For instance, a dipole would do much better if you ran it from a tree to a pole than if it is run beside a tree which will absorb some of its radiation.

What I am going to discuss is radiation efficiency as it relates to the ground below an antenna. The ground will partly absorb radiated energy rather than perfectly reflect it and ought to be considered in calculating the efficiency of an antenna system. The percentage efficiency of an antenna is calculated by:

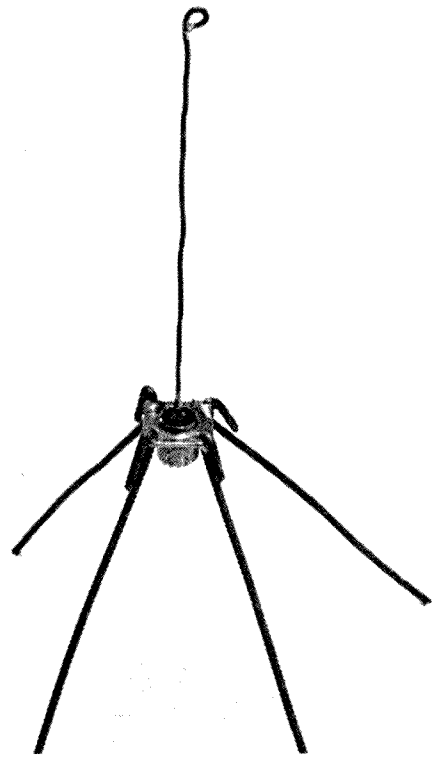


Photo 1 – A simple antenna for 70 cm. Photo by James Isdale

Efficiency % = 100 Rr/(Rr+RL)

Rr is the radiation resistance of the antenna itself and RL is the loss resistance of the ground. To illustrate, suppose a quarter wave vertical antenna has a 36 ohm Rr and the ground has a 150 ohm RL, then antenna efficiency is:

100 x 36/(36 + 150)
100 x 36/186
100 x 0.19
19%

This is not encouraging. 100 watts,

if delivered intact to the antenna, will result in 19 watts radiated and 81 watts applied to warming up the ground.

These figures have assumed that the loss resistance of the ground is 150 ohms. Unfortunately, this is not an unrealistic value. Fine sandy soil will typically have an average resistivity of between 80 and 300 ohms per metre. Clayey gravel will average 200 to 400 and silty sand 100 to 800. Gravelly clays will average 20 to 60 and well graded gravel can be 600 to 1000 ohms per metre.

The radiation resistance appears in series with the loss resistance. The artificial ground provided by some copper wire radials offers very high efficiency in itself but the overall antenna efficiency will be dragged down by the influence of poorly conductive ground. An antenna that is close to poorly conductive ground is going to radiate a severely diminished signal. One remedy is to elevate the antenna a quarter wave above the ground to effectively eliminate its influence.

The fact that radiation resistance and loss resistance are in series offers another way to get improved results. If the antenna has a large radiation resistance in relation to the loss resistance it will operate more efficiently.

Consider the half wave vertical antenna. These are sometimes rather loosely referred to as being ground independent. This is a little misleading as what is really going on is that the radiation resistance of the antenna element itself is so high that the additional component from the ground is a small proportion of the total resistance and so does not drag the efficiency down very much. Over a perfectly conducting ground this antenna will have a radiation resistance of 1000 ohms. Applying the formula to determine its efficiency when on a ground with 150 ohms per metre resistance gives this result:

Efficiency % = 100 x 1000/(1000 + 150)
= 100 x 1000/1150
= 100 x 0.8695
= 87%

This is a much better result. It is a whole lot better than the 19% of the quarter wave vertical on the same ground plus it has double the physical size and therefore double the capture area to receive signals.

To take a different example, if a quarter wave vertical has a three or four radial ground plane of quarter wavelength radials angled down 45 degrees below the horizontal so as to increase its impedance to 50 ohms, and is elevated at least a quarter wavelength above the ground so that the artificial ground is fully effective, then the efficiency of that antenna would be:

100 x 50/(50 + 0.1)
= 100 x 50/50.1
= 100 x 0.998
= 99.8%

For the purposes of illustration I have chosen a value for resistance of the ground plane that is perhaps a little high but will be approximately correct - copper wire is an excellent conductor. The actual value will depend on the length and gauge of the copper wires used for the artificial ground as well as their number. For present purposes it is not necessary to work it out exactly. The point is that, over average ground, a dipole will radiate less efficiently than a half wave vertical or a quarter wave ground plane antenna which, by its design, avoids the real ground and substitutes an electrically good one.

Applying the efficiency calculation to a ground with low average resistivity such as clay, where about 30 ohms per metre could be achieved, yields the following for a dipole with the expected Rr of 72 ohms:

Efficiency % = 100 x 72/ (72 + 30)
= 100 x 72/102
= 100 x 0.70
= 70%

The same dipole over 150 ohm ground would be:

= 100 x 72/(72 + 150)
= 100 x 72/222
= 100 x 0.32
= 32%

If the ground under the dipole is somewhere in the middle of the figures that I have used, which is probably typical, then it may be expected to be 50% efficient. The remainder of the energy fed to the antenna will be lost as heat into the ground. A quick fix would be to water the ground under the dipole in order to improve its conductivity.

Overall, the efficiency of the quarter wave vertical antenna with an artificial ground plane is very attractive. As an alternative, the half wave vertical could be a good choice in some locations as it occupies very little space, although it will need a low loss impedance matching transformer at its feed point. Such a transformer would typically have an expected loss of only 1 to 2%.

The principles we have considered will apply regardless of the frequency for which the antenna has been designed. Naturally, antennas for lower frequencies will be physically larger and a quarter wave ground plane antenna with quarter wave length radials mounted at least a quarter wave length in the air will be a little cumbersome and will become impractical for most locations for frequencies much below about 14 MHz. The half wave vertical, of course, could be a space saving solution for some locations.

None of the antennas we have considered should be initially ruled in or out. What is used will depend on the circumstances at each location, where we must weigh the advantages and disadvantages of different designs to reach the best compromise. The illustration shows a simple antenna for 70 cm, a quarter wave ground plane made from a SO239 panel mount socket costing under $3. The ground plane is made from some copper wire that was on hand and the radiator from copper wire of suitable thickness that would fit into the hollow pin on the connector and so attach easily. The overall height of the radiator is 95% of what would be a quarter wavelength in free space. The small loop at the top is there so that the antenna can be suspended from a thin cord and hauled up as high as possible over a suitable object such as a tree limb.

To make the same thing for frequencies down to 20 metres will be practical in some locations, especially if there is a skyhook in the form of a tree from which to suspend it. The radiator can be hung vertically and the radials made of flexible wire and pulled out to 45 degrees by non conductive cord which is then tied into position by use of a convenient tree limb or even a garden stake into the ground. Keeping the radiator and ground plane elements a quarter wave length clear of anything will maximise the efficiency of the antenna, allowing it to approach the 99% level.

The quarter wave vertical provides a low angle of radiation for good long range performance. The tendency of man-made electrical noise to be vertically polarised, as the electrical field from this antenna is, will be a consideration. Other more positive qualities of this design are high efficiency, very low cost and low visual signature.

A useful attribute of the half wave vertical is that it can be simply constructed of readily available aluminium tube, it does not look like a radio antenna and, if you put the correct flag on it, no-one in the land will be able to successfully object to it.

ar

Working DX 16 metres above the Indian Ocean

Graham Rogers VK6RO

When was the last time you worked DX from a location 16 metres ABOVE the Indian Ocean?

Lionel, VK3NM/VK6DC decided he wanted to do it, so in December 2004 he drove about 3000 km from Melbourne to my home QTH of Perth.

In early January Lionel and I went down to the North Mole at Fremantle, set up his portable setup and we got a taste of DXing from a location about 16 metres directly over the Indian Ocean which is just about a perfect reflector.

Lionel's portable setup includes a 7 metre "Squid Pole" which collapses down to a tube about 1 metre in length, an Icom 706 MK11G and a full size 80 metre dipole [inverted vee configuration] fed with twin feeder via a MFJ tuner.

We set this up on the North Mole that is actually one side of the sea entrance to Fremantle harbour; the feed point was about 16 metres above the Indian Ocean.

There was a strong sea breeze [Freo Doctor we call it] and you can see the pole and feedline bending over the ocean.

We were about 500 or so metres out into the ocean, surrounded by salt water except on the road along the top of the rocks.

A few people who arrived to do some fishing gave us some funny looks and one bloke asked what sort of fishing rod setup we had!

Mentioned Amateur radio and got a blank stare as the response, however a WW2 veteran who was in signals was shocked when we told him we still used morse code, but he understood about H.F. propagation etc, and was interested to hear the beacons from 4S7, JA and others on the 21 MHz beacon frequency.

This location was idyllic from our point of view, all we need to work out is how to get a wire up the top of the small lighthouse at the end of the mole, run it a few hundred metres along over the rocks and tune up!....Magic.

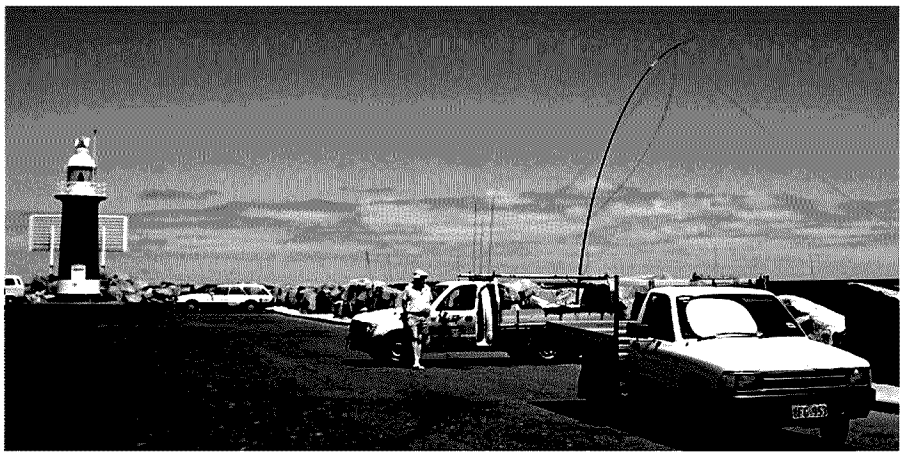
Then there was Lunch, nothing like a homebrew meat pie and can of coke from the Kiosk down the road at the entrance to the mole.

If you see a bloke in the photos wearing a hat, its yours truly, VK6RO

So if you want to enjoy a nice hot pie, can of Coke and the cool Freo Doctor on your face while working DX, wander down to Fremantle.

PS. We call it the Freo Doctor because when its about 42 degrees in Perth, the seabreeze comes in, and makes everybody feel better.

ar



Photos - The lighthouse at the end of the North Mole, plus the antenna etc setup and VK6RO near Lionel's Ute, my Ute in the foreground, top picture.

Green Cape Light 2005

Ken Robertson VK3HKR
Green Cape Lighthouse

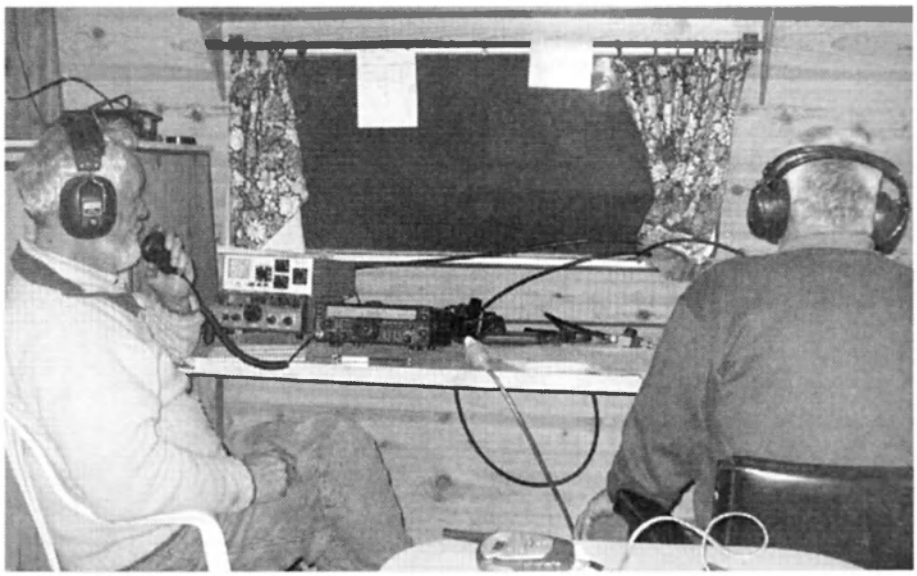
A group of three Victorian amateurs travelled up to 700 km to establish Lighthouse 85 at Green Cape, located south of Eden and north of the Victorian border.

Our group consisted of Albert VK3KLB, Gavin VK3VTX and Ken VK3HKR accompanied by their wives.

Green Cape is located QF52 at 37 degrees S and 150 degrees E. On arrival we were welcomed by Steve Merson, Ranger for the NSW National Parks and Wild Life Service who was further supported by Craig Dickman from the regional office at Merimbula. These people had organised a caravan for us to operate from at the base of the Lighthouse. Additionally, publicity of the Lighthouse event had been arranged through local ABC Radio and South Coast Radio 2EC.

During the course of the weekend over 150 contacts were made including 19 Australian light stations and four in NZ. A variety of antennae were used but principally a "tripole" on 20 metres proved successful and this was the usual dipole with a vertical section supported from the Lighthouse 29 metres above. A kite antenna was also tried but wind conditions were not favourable. VHF and UHF contacts were rather limited, as the linking process north from the south coast area of NSW was not operational.

An interesting aspect of the Lighthouse is the staircase, which was progressively built into the internal walls of the tower with the result of a very rigid central spine supporting the whole structure. Construction commenced in 1881 and took some two years to complete. Much of the material was imported from England. However, the hard part was transporting this equipment from sea level to the construction site.



Albert VK3KTV left, Gavin VK3VTX right

Our whole mission would not have been so successful without the support of our friends from NSW Parks and Wild Life Service and Kevin VK2CE, Registrar of the Lighthouse Week Program whose efforts are acknowledged.

ar

Albert VK3KLV

Gavin VK3VTX

The International Lighthouse and Lightship Weekend

Ron Brumley VK4FC

Historic Lighthouse, Lighthouse Park, Burnett Heads

The Association of Lighthouse Keepers holds International Lighthouse Day on the third full weekend in August each year when many Lighthouses around the world will be open to the public. The International Lighthouse Day helps to raise the profile of Lighthouses, Light vessels and other Navigational Aids, promoting the rich aspect of our heritage.

Trusts and "Friends" groups use this day to raise awareness of their work and involvement in the preservation of the history of light keeping and on Sunday 21 August the old lighthouse at Burnett Heads will be open to the public with pictorial history on display.

On this day Amateur Radio Operators all around the World will be transmitting from lighthouses with the objective of fostering international relations, exposing their hobby to the public while focussing on lighthouses and their preservation.

This annual Amateur Radio event came into being from the Scottish Northern Lighthouse Award Week-end and in the last seven years it has grown to over 370 special events stations being established at participating lighthouses in some 51 countries around the world.

The Bundaberg Amateur Radio Club participated in the recent "International Lighthouse and Lightship Weekend" setting up club station VK4BW alongside the historical Burnett Heads Lighthouse. The lighthouse served at the south head entrance to the Burnett River from 1873 until it was replaced by a modern structure in 1972. It was then relocated for preservation to Lighthouse Park, Burnett Heads. The National Trust of Queensland listed it on the "Register of Significant Places" in 2002.

Rusty VK4JM, Joscelyn VK4JJ, Anske VK4CAB, Ross VK4JRO and Bob VK4UD set up and maintained the site. A Hustler vertical all-band antenna was set up on the top of the lighthouse. Contacts were made with Australian and New Zealand lighthouse stations on 20 and 40 meters, attracting publicity and interest from the local TV media and visitors to the park.

ar

Anske VK4CAB and Rusty VK4JM operating the Bundaberg Amateur Radio Club station VK4BW during the recent International Lighthouse and Lightship weekend. The station was set up adjacent to the historic Burnett Heads Lighthouse (above right and cover)

Toyota Rally of South Australia

August 6/7 2005

Colwyn Low VK5UE

WICEN SA once more provided scoring and safety communications for the Rally of South Australia. This year ROSA was sponsored by Toyota. This is a dirt road rally run in the Mt Crawford Forest reserves and unsealed council roads in the Mt Lofty Ranges north and east of Adelaide.

The voice nets used the four Adelaide 2 m repeaters with translators and three 2 m simplex translators. The digital information was carried on the APRS simplex channel 145.175.MHz

Some 50 amateurs and friends from five local radio clubs made up the team that ran communications in the field on 20 stages over two days, a further 6 operated the HQ station.

The clubs involved were South Coast ARC, Elizabeth ARC, Barossa ARC, NorthEast ARC and Adelaide Hills ARS. On some stages amateurs also had to operate the Skynet system. Skynet uses an aircraft relay to get information from the stages to the Rally HQ, this year at the Novotel Resort at Rowland Flat in the Barossa Valley.

The Best Stage Award went jointly to Charleston supported by South Coast ARC and Kenton Valley supported by the Elizabeth ARC.

In the absence of other pictures, Picture 1 is the Start Control on Kenton Valley operated by Elizabeth ARC and Picture 2 is the Kenton Valley Finish control.

The hilly terrain requires use of elevated non-directional antennas. Elevated ground planes were recommended. Skynet used a small ground plane for its 500 MHz operating frequency.

Most stages operated well and overcame the usual minor problems. Some rerouting of communications was required when stations did not use the recommended antennas and could not properly access the elevated repeaters. However in the end all the required information was delivered as required.

ar

Start Control Left to Right Andrew Hall, Dennis Hall Keith Gooley VK5OQ. Skynet box with IC706MKIIG behind. The handle is part of the battery trolley. Antenna was a copper pipe J-pole at 7m.

Finish Control. Left Packet station and Skynet on table behind Beetle, Voice net via tripod antenna.

The Ten Tec Orion is different!

Martin Luther VK7GN

What follows is not a technical review but a personal overview by an active and experienced HF operator.

The time had come to consider a new radio. Did I need one, probably not! Did I want one, yes! I had been watching the progress of the newer radios over the last year or so and had decided that the technical specifications of the Ten Tec Orion looked very good. They had stood up well in the detailed testing done by both the ARRL and the RSGB (references 1 and 2).

I had a good experience using a Ten Tec radio a few years ago in the United States. I also received excellent service from Ten Tec when I acquired a second-hand Argonaut 509.

A small windfall in 2004, and meeting Dave of TTS Systems at the Tasmanian hamfest in November, led to an order for a brand new Ten Tec Orion.

On the negative side, various stories were floating around on the internet that the computer programming in the Orion was unreliable, full of bugs that required frequent re-sets. I spent time evaluating various reflector messages. I gradually became more attuned to the comments of the radio's supporters who did their best to explain the radio and coach people in its use. The detractors on the other hand, while claiming technical superiority, did not demonstrate it in their comments.

It looks business like. It is not a show pony. The latest Icom and Yaesu offerings certainly provide more immediate consumer appearance appeal.

It is not heavy as there is no built-in power supply. The buttons all fall easily to hand and the menus are clear and not buried two or three deep. The LCD display comes in black or white and the buttons and knobs are labelled in white on black.

This is a radio that desperately wants to be taken seriously, I thought!

Connect up the power and switch on. Thanks to a delay in delivery, and the wonders of the modern internet, I had been able to spend a lot of time carefully reading the user manual downloaded from Ten Tec's excellent web site. This, of course, made me even more cocky than my usual 'turn it on and read the manual later'.

Photo – Martin VK7GN playing with his 'new toy'.

The radio stood up to this test well. It came up and told me all I needed to know on its display panel. The thing receives and transmits. Check out the overseas reviews for the numbers. It goes as advertised.

This is an operator's radio. It gives you control of most aspects of the receiver which means you can tailor the radio for best results in particular circumstances. You can also produce a terrible result!

I found it quite easy to make the radio worse! Especially easy when I started to fiddle with the settings in the AGC menu. This is a new design and some of the changes are not intuitive. However, Ten Tec seems to have taken the view that the operator should be given the power to be able to run his receiver in the way he wants. You can get the Orion set up for weak signal low band or, with a few changes, to provide a quiet rag chew on a very noisy 80! It is in the hands of the operator. Of course, this flexibility means that it is possible to go over the line that defines best performance. However, that is inevitable if the operator is to be given the power to operate at the edge of performance.

This is an operator's radio.

Most of us have accepted the compromises involved with using appliance/consumer radios that don't give us any surprises but also don't let us maximize their performance. Not quite true as, of course, many of us modify and change the 'plain vanilla' into something that actually works. Some people even modify their FT1000s to get rid of those annoying key clicks. Hi!

I have built multi-stage receivers and modified many radios, but this Orion took me a while to get the hang of how it works. I chuckle each day as I see on the net the clashing of cymbals and sounding of trumpets from those who claim to have RF engineering experience, to be radio technicians, and so on, condemning this radio which they can't make run their way. Nor could I until I read, fiddled and began to understand!

TTS Systems Communications Equipment

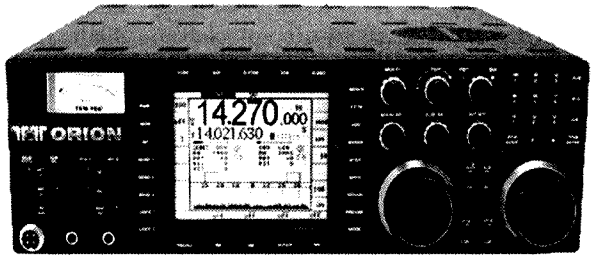
TTS Systems www.ttssystems.com.au **FREE CATALOGUE**

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

TEN-TEC

Announcing Orion II



What's new about ORION II ?

Super bright, TFT color display, CCFL backlighting. New 32-bit control processor using the latest generation Freescale DragonBall Super VZ chip.

Faster front panel control response and accelerated remote operation via RS-232. Orion II also has facility for a future "HIGH SPEED SWEEP" add-on. All-new firmware from the ground up. DSP code is refined, crafted and compacted to levels unimaginable even two years ago. Provides faster (stock) sweep with finer resolution, enhanced DSP automatic notch and DSP noise reduction.

All-new suite of ORION II-specific roofing filters is arranged in a single bank to allow selection of the absolute ideal roofing filter for mode, band conditions, and personal preference. The narrow (600 and 300 Hz) filters are now in the same initial bank with all the rest. This new arrangement yields subtle improvement in dynamic range. The new filters have less passband ripple than ever offered.

ORION II comes standard with 20, 6, 2.4, and 1 kHz installed. Optional filters are 1.8 kHz (model 2000), 600 Hz (model 2001), 300 Hz (model 2002). That's not all - the optional filters cost less than before! Mixing architecture for analog stages has been re-arranged to give self-correction for frequency stability.

Digital mode operators will appreciate the variable (programmable) line level output on rear panel completely independent of front panel controls.

ORION II now uses the popular 8 pin mic connector. This broadens the range of mikes and accessories readily available through the hobby for your use without finding or making adaptors.
We expect deliveries of ORION II mid November. We are taking orders now. As always, no charge will be made to your credit card for an order until the day the item(s) ship.

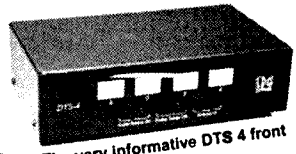
This is an even more advanced rig than the one tested in the article.

New From LDG Electronics —

DTS-4 Desktop Coaxial Switch

Switching between antennas no longer requires under-desk acrobatics to connect up, but coax switches often take up scarce desk space.
And if lightning strikes, "Did I set the switch to Ground?" If not, do you now own a pile of rubble.
With LDG DTS-4 Desktop Coaxial Switch you can instantly switch your rig between 4 antennas with the press of a button. All five coax sockets (4 in,1 out) are on the back, . The DTS-4 will fit in just about anywhere on your desk. A bright red LED indicates the antenna in use. Touch a button and all inputs are grounded. Remember that lightning strike when you are out? The DTS-4 can sense when your rig is off, and automatically ground all antenna inputs and you start up again on the last used antenna.
Using a compact remote control box (DTS-4R) you can remote-mount the DTS-4, the desktopper has all the features but only a single, slim control cable running to the remote DTS-4 switch. 1500 watts of RF power on HF (1000W on 6M), it can be used with any coax-fed antenna. If the power supply fails, it grounds all inputs.

Six position version will soon be available



The very informative DTS 4 front

Highly organised back

Model 516 Argonaut V IF-DSP QRP Transceiver

IF-DSP, modern 20 watt HF transceiver. 20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjust 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP). Metering measures forward or reflected power in switchable 2 or 20 watt scales.

We have

SGC

SGC 237 Waterproof Auto Tuners
SGC 239 Economy Auto Tuners

Autek Antenna Analysers
Autek RF 2kW In-line Power meters

LT Lutron

Lutron Measuring Instruments

Vantage Pro Weather Stations

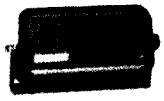
MAC-200 MASTER ANTENNA CONTROLLER (Smartuner Built-In)

Control up to 5 Antennas

Select the right antenna, for right band, at right time. The Master Antenna Controller is your base station control center, no switching and tuning. You select from five antennas and automatically get minimum SWR. Monitor your power and SWR. With MAC-200 you control your antennas.

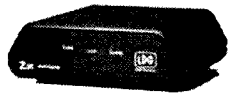
ADSP SPEAKER

SGC



Three modes:
•no noise reduction; original ADSP; new ADSP2 noise reduction –up to 26 dB of noise

LDG ELECTRONICS

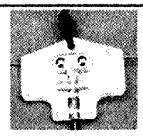


z100 TUNER ANDZ1000 HIGH POWER AUTO TUNER

TEN-TEC **KITS**

Ten-Tec 3003 Acro-Bat antenna hanger.

UV resistant, S/S hardware. Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna.



Order your 450 ohm Ladder Line NOW

SG-237 Smartuner™

High density surface mount components in a 4 layer PCB on chassis: high efficiency, reliability, performance, excellent electrical and RF ground system. Weather resistant, factory-sealed ABS plastic.

MULTIPLE APPLICATIONS -- Use for base, mobile, portable, marine or aviation. Rugged and small gives max. flexibility. 100W power, coverage to 60MHz, matches most popular HF transceivers. Use balanced or unbalanced antenna: whips, backstays, dipoles, loops and longwires, only 28 feet of antenna for full coverage operation.

Full info available—ask

BUDDIPOLE

Dipole — vertical... Fits in travel bag! Optimised for transmit power, proven for DX work. Ultra light materials, High-Q coils. Zero-loss balun with Quick-Connect feedpoint.

Standard Comes with—

- Two 22" black aluminium arms. Two multi-band coils (40- 10m), adjustable coil tap pre-marked system • Two SS telescopic whips, VersaTee™ w 3/8" x 24 adaptors
- BNC/PL259 coax connector, 25' of RG58 coax
- Carry bag

Rule Number 1

If you want a radio to just chat to other hams, and you have no interest in the ultimate receive capability, do not buy an Orion.

Having established a variety of set ups for different modes or operating techniques they can be recorded in the radio's user profiles.

After a while I arrived at the point where I could think Orion. I began doing side by side comparisons with my Icom 765s, two of which have been the mainstay of my HF operation for over a decade. I understand the strengths and weaknesses of these radios very well.

In normal daily operation there is little difference. The Orion has better audio but I did not hear anything on the Orion that is not OK on the 765 also.

There was an RTTY contest on that weekend so I got them both set up with a logging programme so that I could build up a band map of calls heard. Both work well on the mode. The Orion has some filters and notch options that make it slightly better but an external DSP on the 765 brings it close.

So I get on 40 m and start building up the band map. The band is open to Europe and I put every single call I can resolve on the 765 into the band map. Then I did the same thing on the Orion. There seemed to be more signals so I did another pass on the 765 to make sure conditions were not changing quickly.

Back to the Orion and the band map population looked different. I was seeing more stations closer together than I was used to seeing! Especially on 40 m to Europe the BIG stations tend to dominate and the map goes from one to the other of these super stations. However, in this test I was seeing some smaller stations between the big guys.

Hmmm! This is where the Orion really shines through. I am able to copy signals between the big stations on the Orion that I cannot resolve at all on the 765.

Rule Number 2

If you want to copy weak signals in the worst possible noise and QRM, consider the Orion.

In doing all the tuning around I had cause to change the tuning rate for the VFO a number of times. This involves pushing the step button then choosing from the options which appear on the screen; another button push and its done. I thought, wouldn't it be nice if I could just speed up a bit using one button instead of two! No sooner thought than I found that pushing the VFO button, just to the right of the tuning knob, toggles the tuning rate up one step and back down with the next push.

This thing was designed by people who actually use HF radios, a lot!

The next weekend saw a CW contest. In CW I usually ride a finger on the RIT control to resolve one signal out of the pile by changing the tones and fringing on the edges. In the 765 the RIT is a medium sized knob ideally placed at the bottom of the radio and matches this way of operating.

At first I was upset by the Orion's RIT which is half way up the panel. I kept looking enviously at that big knob at the bottom which is a second VFO thinking wouldn't it be great to use that. Yes, you are ahead of me and so are Ten Tec. You can allocate each VFO to any of Main Rx, Main Tx, and Sub Rx. OK, one button puts VFO B on the Same Frequency as VFO A. Another button puts VFO A on Main TX, Switch OFF VFO A from main Rx and switch on VFO B to main Rx. Split operation with two proper tuning knobs. Going back to transceive is simple.

...a very good system for receiving two frequencies while providing flexible transmit control. It provides satisfaction to those prepared to learn how to use its performance.

The Orion has an external pod which can be located by the computer keyboard and provides big knob RIT along with many other facilities.

Things are not only explained on the display but also indicated by LEDs on the various switches. Both tuning knobs have a very nice feel!

The flexibility of the radio is outstanding. This radio has been designed and constructed by people who understand HF operation.

There are two VFOs (each with its own large knob), two receivers and one transmitter which can instantaneously transceive with either receiver. All in the one box! One receiver is optimized for ham bands while the other provides the normal wide band coverage. They each have their own filters and identical DSP capability. The only difference is in the front end. The second receiver is not as 'bullet proof' as the main receiver but it is still very good.

Although there is only one transmitter, it can control two linear amplifiers with separate band and keying (including QSK loop control) information to each.

For years I have used the two transceivers in my HF station as what is known as a single operator two radio (SO2R) contest station. I can listen to both at the same time, one on the left ear and one on the right, or switch to concentrate on one or the other. Each transceiver has its own linear and a flexible antenna switching system allows each to access any antenna.

The Orion goes some way to replace the two transceivers. It really does not matter that one receiver is slightly better than the other as the second one can be on the multiplier chaser. It is so easy to swap from one receiver to the other that flexibility is maintained and the best radio can be used where it is needed. With only one transmitter it is also impossible to transmit on two frequencies at once, a definite no-no if you are single op. I have not yet found a way to get the second receiver to listen on one band while the transmitter is CQing on another. So, in that sense it, is not a complete SO2R solution.

The two receivers also help to work DXpeditions with one receiver on the pile up frequency and the other on their transmit frequency. The Orion's inbuilt feature allows the receiver outputs to be switched to each headset ear so that both frequencies can be monitored simultaneously. Works smoothly. You could even use one receiver to look for the DXpedition on other bands while trying to get them on the existing band.

Rule Number 3

If you want SO2R type flexibility either for contests, DX chasing or monitoring multiple frequencies, the Orion can do it in one box.

I have become a convert to the Orion. However, like any amateur radio equipment, it is not everything to everybody. Anyone involved in manufacturing knows the pricing limitations that force this. It is a very good system for receiving two frequencies while providing flexible transmit control. It provides satisfaction to those prepared to learn how to use its performance.

Download the manual and if, having read it carefully, you feel that you cannot be bothered with thresholds, gains and decays, then the Orion is not for you.

Celebrating the ITU's 140th birthday

Barry Robinson VK3JBR

Special event station AX3ITU was activated on World Telecommunications Day, 17 May 2005, and achieved an overwhelming success in spite of poor propagation and band conditions.

The 24 hour operation is particularly challenging because it's duration is a single UTC day. A team of Amateur Radio Victoria members joined a roster and their efforts resulted in 600 contacts, including 30 countries.

More than half of the contacts were made on CW. Peter Forbes VK3QI suffered a radar type signal interference on 30 metres but was peaking QSOs at a rate of up to 60 an hour. Dale Whatley VK3YR added to the CW tally.

Phone operation was on the 80, 40, 20, 15, 10 and 2 metre bands. Rostered operators who were lucky to have useable propagation during their time slots were Max Brighton VK3ZMT, Peter Wajngarten VK3OJ, Ernie Walls VK3FM, Gerard Werner VK3GER, Jim Linton VK3PC, Rob Carmichael VK3DTR, Rob Ashlin VK3EK and Peter Morrison VK3NPI.

Using PSK31 was Jim Baxter VK3KE. In what could be 'firsts' for a special event station of this type, AX3ITU used Amateur Television and several passes of a new satellite.

ATV veteran Peter Cossins VK3BFG displayed a QSL card on the Melbourne ATV repeater VK3RTV inviting reception reports via the ATV 2 metre liaison channel. A total of 12 stations through the Melbourne area made contact during the two-hour special event telecast.

Noel Ferguson VK3FI put AX3ITU on air through AMSAT-India's Hamsat VO-52 just days after reaching orbit and being commissioned. Despite the Doppler shift quirks of the low earth orbiting satellite, he had plenty of QSOs.

AMSAT-India gave Amateur Radio Victoria its blessing and good wishes for the special event station. An audio file of an AX3ITU contact through VO-52 was being sent to AMSAT-India for its information.

AX3ITU has been active annually for most of the past two decades on 17 May, the International Telecommunications Union's birthday. Amateur Radio Victoria has issued a commemorative QSL card. Claims for it can be made direct to VK3WI QTHR or via the bureau.

ar

Photo 1 - Peter Forbes VK3QI on the key activating AX3ITU.

The Ten Tec Orion is different! *continued*

You will never be happy with it. If you like glitter, colour displays, multiple readouts and knobs and buttons, then the plain black Orion is not for you. This is a serious radio that takes itself seriously!

Finally, let me comment on the most often heard comment about the Orion: that it requires frequent software resets. I have not experienced this in three months of operation. My radio has only complained when I have done odd things like having the computer send it an instruction to set its frequency to 00 MHZ!

The Orion is the best radio I have used specifically designed for the amateur radio HF enthusiast.

I recently operated at a multi-operator multi-band contest station using FT1000MPs of various ages and models. All of them felt inferior to the Orion, especially on the low bands.

The Orion reminds me a lot of old sports cars, like the Porsche 911 or Austin Healey 3000. In the right hands they were brilliant and a joy to drive but, if you did not know what you were doing, they could slide and spin very quickly causing great embarrassment. The Orion is the best radio I have used specifically designed for the amateur radio HF enthusiast.

Given the price of these high end radios now it is hard to answer the question on whether to spend the money. My old Icom is worth less than 20% of the Orion. The Orion is a better radio but, for most operators, it is not five times better! However, if you want the best pure radio performance it is the price to be paid!

References

ARRL QST January 2004

RSGB Radcom June 2004

Ten Tec Orion website:
http://radio.tentec.com/Amateur/Transceivers/TT565

TTS Systems: www.ttsystems.com.au

ar

Review of

bhi digital signal processing units

Eric Buggee VK3AX

Recently, I was given two samples of English "bhi ltd" Digital Signal Processing units with a request to evaluate these units for this magazine. They were a noise eliminating speaker, model NES10-2; and an amplified noise eliminating DSP module, model NEDSP1062 KBD. The subject items were kindly supplied by Lee Andrews of Andrews Communications at Greystanes in Sydney.

Noise reduction using DSP engines has been with us for a few years now. As time has passed, the techniques used in the DSP process have been refined significantly in both the digital chips and the onboard software (firmware).

The software and hardware have been refined to the point that we have a technology that offers significant improvements over the devices available four to five years ago.

Photo 1 - The bhi NES10-2 noise eliminating speaker.

Fundamentals of DSP

DSP is a complex and powerful technique allowing manipulation of analogue signals impaired by the presence of noise.

A basic DSP system takes the analogue signal, plus noise, and applies this to an A to D converter, either separate from, or part of, an LSI chip (engine) with a resolution anywhere from 8 to 16 bits or even more, depending on the system (8 bits = resolution of 1 in 256 and 16 bits = resolution of 1 in 65,536).

The digitized data stream is transferred (clocked) into the DSP engine where the data stream is manipulated using proprietary algorithms that separate the coherent signal(s) from the noise that is random in nature and thus non coherent.

The firmware (embedded software) in the DSP engine handles the signals, data or voice, in an adaptive process (depending on the characteristics of the noise) that effectively enhances the data/voice signal whilst suppressing the noise components on the original signal.

This enhanced data stream is then clocked into the D to A converter where it is amplified and fed to the speaker or modem as appropriate.

DSP in the real world

I had heard from various fellow amateurs in the past year or so that the new noise cancelling speaker units now available are nothing short of "miraculous".

Being fairly conservative (read sceptical) by nature, I applied a healthy discount to these statements by my fellow amateurs, based upon my hands-on experience, having owned two different makes of outboard DSP units, both of American origin. One has since been sold and one retained in daily use. No names, no recriminations! I also have installed a DSP unit in my workhorse IC706MK2.

The main shack rig, a Kenwood TS2000, also has DSP capabilities, so I believe this gives me a reasonable basis on which to comment.

These units from bhi ltd use adaptive processing algorithms, which give results that are truly impressive. In fact, I was stunned by their performance.

Allow me to digress here on the liking for DSP. Being on the sunny side of 70, my hearing is no longer at the point where I can hear TV line oscillator transformers doing their magnetostrictive dance (that is singing at 15,625 Hz). Also, years of working low band DX (pre DSP days) with attendant summer static crashes have not helped!

Enter DSP. I don't know about you,

but for me every dollar spent on GOOD DSP is well spent, if only from the aspect of hearing conservation! There is also the enhanced readability that DSP provides.

The DSP tests

The units arrived well packaged in their respective cartons with bubble pack plastic packets. Packed with the NES10-2 noise eliminating speaker were two mounting screws, four self-adhesive rubber pads, a fused power lead, a car accessory lead (cigarette lighter plug) and a customer feedback card. There also was included a very informative 31 page operating manual. This manual is pocket sized with illustrations of actual oscilloscope displays showing before and after processing of signals.

The NES10-2 is a small black speaker/box measuring approx 110 x 65 x 55 mm and weighing about 200 gm. At the rear to the right is a 2.1 mm DC power receptacle, centre pin positive. It will accept voltage in the range of 12-24 V DC. To the left of the power receptacle is a table showing DIP switch settings for the various degrees of noise cancellation. To the left of the table is the DIP switch labelled "Filter Select" allowing for selection of one of eight levels of noise cancellation. Level 8 provides the most, while level 1 the least cancellation. The unit comes set at level 6. The DIP switch has four sections, but only three are used. The other is reserved for future use.

... results that are truly impressive. In fact, I was stunned by their performance.

On the bottom of the speaker housing is the power switch/audio bypass. This slide switch cuts power to the unit and a released relay connects the speaker directly to the audio line from the feed source (receiver or transceiver).

On the top of the NES10-2 there is a slide switch labelled 'Noise Cancellation (On-Off)' and a small pre-set volume control shaft, which is user pre-set to the required level.

Installation

This could not be easier. The power lead is connected to a suitable 12 to 24 volt DC source, noting correct polarity for the power feed. Your transceiver or receiver may have a compatible 12 V DC socket with capability to 500 mA.

The attached audio feed cable is about 2 m long, terminating in a 3.5 mm stereo jack plug which should be plugged into the external speaker socket on your radio. All that remains is to tune in to a suitable signal and adjust the audio output levels, from both your radio and the NES10-2, to your own personal liking, ensuring that you do not over-drive the input to the NES10-2.

Turn on the noise cancelling and the front panel LED will change from red to green, indicating that the noise cancelling circuitry is active. Sit back and enjoy significantly enhanced audio minus noise.

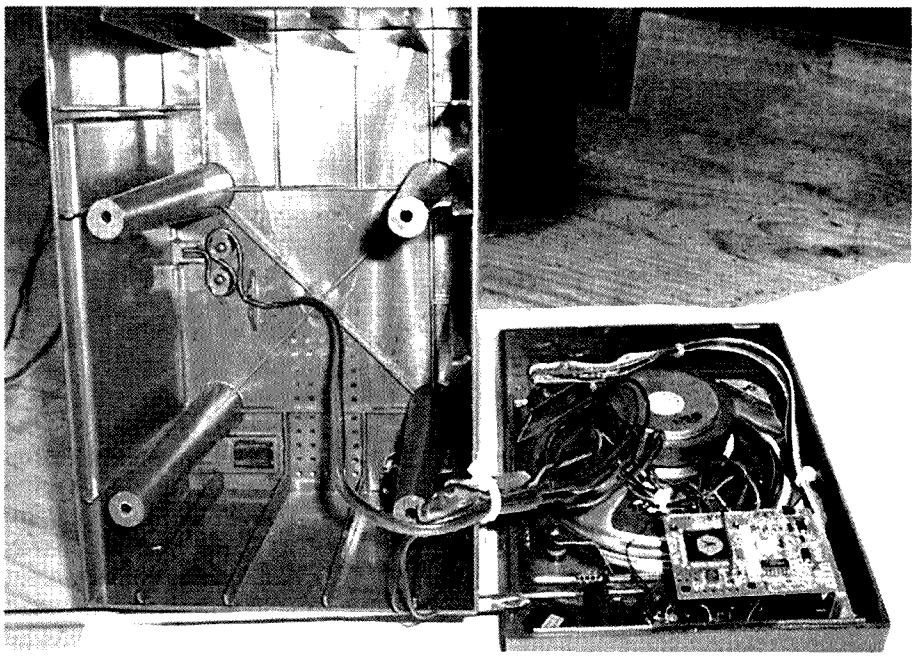


Photo 2 - View of the bhi NEDSP1062 KBD pre-wired module as fitted into a discarded Sony speaker housing.

Using the NES10-2

I have several radios with which I tried the NES10-2. They are an ICOM IC706MK2, a Kenwood TS2000, a Drake R4C, a Hammarlund SP600 Super Pro and an Eddystone 880/2.

On all of the above radios, signals that were weak and difficult to copy, and at times unreadable, became readable with virtually no noise. The normal band noises, such as hissing, popping, crackling and frying, were very significantly reduced.

bhi ltd claim noise reduction performance from 9 to 35 dB, selectable via tabulated switch settings from 1 to 8.

Performance measurements

To measure the noise attenuation at given settings, using either HF band noise or noise from an open mute on a VHF FM rig, is not as easy as one may think.

I tried using the automated signal-to-noise ratio test on my Rohde and Schwarz CMT52 and CMT54 test sets, but the pulsed nature of the automated test routine, whilst perfect for a normal radio, did not work properly due to the inherent processing delay of the NES10-2.

So, I resorted to an analogue test set-up using a Marconi audio power meter to read the output noise power from the NES10-2. With input and output levels set to equal power, measurements were then attempted by switching between processing on and off. This was, likewise, fraught with difficulty, as peak amplitude of the noise was quite variable.

Further measurements were made using a Tektronix 7704A scope to measure the input /output noise reduction under actual conditions.

I can confirm that the NES10-2 does provide, on analogue measurement, a minimum of 20 dB of noise reduction. To do justice to the NES10-2 one would have to employ a sophisticated noise test setup with peak hold capability and synchronized to accurately relate

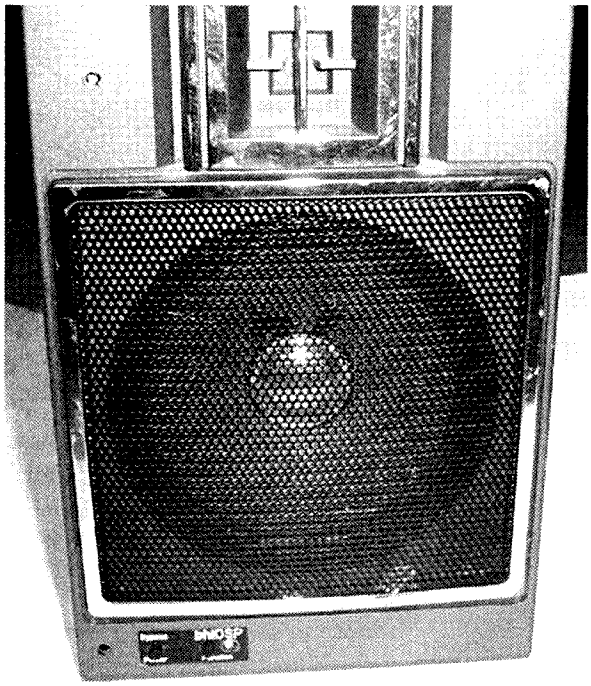


Photo 3 - Front view of the discarded Sony speaker housing showing, at the lower left corner, the two button control keyboard and tri-colour LED of the NEDSP1062 KBD. At the upper left is a 4 mm hole with the sounder behind.

the instantaneous reading of the input bursts of noise/signal to the processed output on the same statistical noise and signal burst.

Having said the foregoing, "The proof of the pudding is in the eating"!

The NES10-2 at work

This is where the unit shines! The NES10-2 works superbly on all of its settings.

I have two minor comments. Firstly, at all settings up to 6, there are no audible processing artefacts. What comes out is wanted signal minus noise. Being picky, at setting 7 there is a small amount of processing noise as the unit is working to remove heavy noise and, at setting 8, this "watery" noise is more noticeable. But, operationally, this is a small price to pay for such extreme levels of performance. In my view, the only times that one would need to use setting 8 is when one is desperately trying to get the last ounce of system performance on weak signal DX work. This is where a good low noise antenna will provide a valuable performance edge. But that is another matter!

My second comment is on the matter of the transducer (speaker) in the NES10-2 itself. I found that at high levels of audio the little speaker itself was lacking. It was not able to cleanly reproduce the audio drive from the internal power amplifier. However, when a good quality external speaker or headphones were plugged in to the NES10-2 the audio was clean and clear for the same drive level.

Summary

By comparison with the other outboard DSP units I have owned, the NES10-2 wins hands down. Compared to the resident DSP unit in the Kenwood TS2000, again there is no contest! The bhi ltd NES10-2 is a clear winner!

Compared to the resident DSP unit in the IC706MK2, again the NES10-2 is superior. However, the margin is not quite as great although the internal DSP in the IC706MK2 is still no match against the NES10-2. It must be noted here that, using the internal DSP in the IC706 on setting 0 to 3, the NES10-2, in tandem, afforded a significant additional drop in the noise output.

The NES10-2 is not specifically designed to attenuate heterodynes or other random tones. However, it does provide about 20 dB of attenuation of musical notes and tones such as heterodynes, etc.

I think that the secret behind the superior performance of the NES10-2 is in the adaptive nature of the processing in its firmware. There are no noticeable artefacts such as little background tones, tinkling noises or distortion products in the output. This implies that the processor uses spectral diffusion techniques. It is obvious that the noise reduction technique is adaptive, coping with many different noise types with no apparent stumbles.

The frequency response is adequate for good, clear audio. A quick test confirmed it to be flat from below 100 Hz up to 4 kHz.

For top-of-the-line noise reduction performance it is the best overall compact package suitable for mobile, portable, or shack operation that I know.

Tests on the bhi ltd NEDSP1062 KBD amplified noise eliminating DSP module

This was the second of the two bhi ltd units that I was asked to evaluate. This unit is a modular PC board unit ideal for building into homebrew gear or as an outboard stand-alone powered noise reduction unit, which may be used with any number of radios.

With the supplier's agreement, I built the module into a spare speaker housing. There was plenty of room to fit the module, small keyboard and small sounder to indicate mode changes and processing levels.

Clear concise instructions and drawings were included to mark-up, drill and mount the PC board module. The components are supplied pre-wired, with adequate wiring tail lengths for assembly. The whole assembly took about two hours.

Testing the assembly

Everything worked as described by bhi ltd and verifying operation of the NEDSP1062-KBD module went flawlessly, as described in the handbook.

All functional control of the module is accessed via the two tactile push buttons mounted on its keyboard. This same PCB also carries a tri-colour LED.

The Power button switches the module on and off. When the module is switched OFF there is a standing current drain of 6 mA and the audio bypasses the module direct to the speaker. Switching the power on routes the audio through the module to the speaker. With the power on, but the DSP module switched OFF, the audio passes through the module but with no processing.

The DSP level button is a multifunction button providing the following:

DSP on/off.

DSP level: 4 or 8 levels of noise/tone cancellation.

Demonstration modes.

To the right of the noise/tone cancellation button is the tri-colour LED.

Set-up

Holding down the DSP level button, a single press of the Power button enables the module in set-up mode. This is

indicated by a two-tone beep. Releasing the DSP button at this point puts the module into set-up mode 1. Keeping the DSP button pressed until a second two-tone beep sequence is heard, and then releasing it, enables the module in set-up mode 2. Keeping the DSP button pressed until a third two-tone beep allows four levels of processing. Keeping the button depressed until a fourth two-tone beep sequence is heard will enable the module into eight levels of processing. I know this may seem a little complicated but, once the various modes have been explored, the procedure is straightforward. The module will retain the selected level/ mode until changed.

Demonstration Modes

Mode 1. This alternately switches noise cancellation on for 1.5 seconds, then off for 1.5 seconds. It will then move to the next level and repeat the process. This mode is very effective at demonstrating the different DSP levels.

Mode 2. The module switches into noise cancellation for three seconds and then into direct audio feed for three seconds. This is a good demonstration of the before and after noise cancellation.

To exit either demonstration mode hold the DSP button down until a two-tone beep is heard.

As stated previously, four or eight levels of noise reduction are available. The amount of tone and noise reduction available vary from 4 dB of tone reduction and 9 dB of noise reduction for level 1, through to 65 dB of tone reduction and 35 dB of white noise reduction for level 8.

Summary of results for NEDSP1062-KBD.

The unit performed to specifications in all functional aspects of the tests performed. Setting of the various modes and levels is straightforward and logical. Audio quality is excellent.

Caution for potential constructors of this kit

There is the potential for RF interference, particularly if attention is not paid to lead dress and appropriate shielding of input/output wiring. For example, do NOT bundle input, output, and power wiring together. Keep them separated as much as possible and, if they must cross, ensure this is done at right angles.

The potential for interference will be reduced if the whole assembly is in a grounded metal enclosure. If a plastic enclosure must be used, the plastic housing should be lined with a metal foil such as kitchen aluminium foil. Connect the foil to common, or ground, of the speaker audio feed from the rig. Hold in place with a contact adhesive.

The use of ferrite toroids with multiple turns as appropriate on input, output and power leads is also recommended if interference problems persist.

I wish to thank Garth Jenkins VK3BBK and Drew Diamond VK3XU for their review of, and positive comments on, the initial draft.

ar

News from...

VK2

Tim Mills VK2ZTM.

AR-NSW has a new web domain - www.arnsw.org.au - established by Web Master Chris VK2QV. The e-mail address remains as - vk2wi@ozemail.com.au - .

Last month, reference was made to making Deceased Estate equipment available for tender. Delayed, partly by waiting on the new web domain, it should now be in place for the November Trash and Treasure. This T & T is planne to be held at the VK2WI site at Dural - weather permitting.

While on the subject of Deceased Estates, AR-NSW continued to provide this service of behalf of the families of "Silent Keys". If we can assist, please contact the Parramatta office. Telephone 02 9689 2417 or an e-mail to vk2wi@ozemail.com.au While nobody likes to think about becoming a "Silent Key", you should mention this service to family members or leave instructions for executors.

Many families, without close contact to our hobby, are left wondering how to dispose of equipment. Please contact the office if you would like more details on this service.

The planned club meeting in conjunction with the National WIA is now scheduled for Saturday 19th November. No other details to hand as these notes were prepared.

The Parramatta office is now staffed on Tuesday, Thursday and Friday, 11 am to 2 pm by a team of volunteers. If you intend to visit and are coming from some distance, telephone ahead – 02 9689 2417 – to check the office is open.

The new keyer on the VK2WI 80 metre morse transmission is going well and we thank those who have submitted reports. Likewise the new 6 metre beacon - 50.289 MHz - is going well and waiting for some summer openings to tell the world. Clubs and groups looking for projects could consider establishing a beacon. VK2 has very few, only those at Dural and those provided by VK1. There is a 6 metre beacon in Newcastle. A few more in country regions would help others observe where and when the openings occur, when there are not operators present. Contact NTAC via the office for establishment details.

A request to clubs and groups. While many are already regular contributors with news and coming events for VK2WI news we would like to offer this service to others. While many are sending in details to the VK1WIA news, why not put an extra address in the e-mail. Send it to vk2wi@ozemail.com.au There is the extra space in the evening news to cover your operations in detail. Most VK2WI news is included on the AR-NSW web site.

VK2WI is also looking for more operators to join the broadcast team. If you would like to assist contact the station in the callback period or the Parramatta office. 73 - Tim.

VK3

Amateur Radio Victoria News

Barry Robinson VK3JBR

Pending retirement

We're seeking a Secretary to replace John Brown VK3JJB who will retire from the Amateur Radio Victoria (ARV) Council at the end of the year to enjoy an extended holiday with his wife Jan. The position is Company Secretary with responsibilities for statutory returns and other corporate requirements, plus other membership administrative tasks. Members wanting to know more about this vacancy, should contact the President, Jim Linton VK3PC. Ideally the position should be filled in the short-term to ensure a smooth hand-over.

Commonwealth Games Melbourne

It was with disappointment that the Commonwealth Games Committee rejected ARV's request to use the official Games logo on proposed special event station QSL cards. An application is pending with ACMA for two special event call signs to celebrate the Queen's Baton Relay and the Games.

Repeater Report

The VK3RPU repeater at Arthur's Seat on the Mornington Peninsula is to receive a replacement tower, followed by new repeater equipment. A new 'snow' antenna has been provided for the VK3RWZ Mt William repeater and arrangements for replacement of VK3RNE Mt Big Ben are ongoing in conjunction with the Twin Cities Radio and Electronics Club. The installation of a new 148 MHz pager system for emergency services is being monitored and once the roll out of these is completed tests will be carried out to check for any adverse impact on co-sited or close proximity 2-metre repeaters.

Support for APRS

The Automatic Position Reporting System (APRS) Group requested the assistance of Amateur Radio Victoria to change their digipeaters to the National APRS frequency. The estimated cost is $700 and the group has already raised $200 in donations from the amateur community. ARV already covers the licensing costs where APRS digipeaters are co-located on its repeater sites and has more recently provided an antenna for the Mt William APRS digipeater. In response to the APRS Group request, the Council of Amateur Radio Victoria will provide $400 for the project.

Electrical safety

The Chief Electrical Inspector of Victoria has warned about the misuse of power boards in homes following recent incidents that have resulted in fires. The Australian Standard requires all power boards to include a circuit breaker to prevent overloading if fitted with three or more outlets. Some older models don't have this feature. Power boards should not be used outdoors, in dusty or polluted environments such as workshops and building sites or wet areas like kitchens and bathrooms.

Web: amateurradio.com.au
Email: arv@amateurradio.com.au
Foundation webpage: amateurradio.com.au/foundation

VK4

Far North Queensland Horse Endurance Ride – Herberton

Radio Amateurs once again provided radio coverage for the above event from 21 – 25 June 2005.

The event covers about 80 km per day, 2 x 40 km sections and requires about 3 checkpoints during each section to ensure both horse and rider are on the correct track, are fit and well, and giving the participants an idea of their speed.

Amateurs assisting were Dennis VK4JDJ, Stan VK4MFA, John VK4JON and Mike VK4MIK.

Communications were via 2 m FM, both simplex and duplex (VK4RTA), plus UHF CB, which allows the base operator to direct aid to riders – there is a first aid person, Vet and farrier at base during the ride. The base antenna was a 5/8 whip with radials on sectionalized aluminium poles that are about 10 metres in height. Due to the hilly terrain the use of the 2-m and the knife edge diffraction allows signals to propagate out of valleys etc.

The "Radio Men" received much praise for being cheerful, having a joke, giving water and just being there. The appreciation grew with the tiredness factor of horse and rider.

The days began before 5 am and concluded with a briefing on the next day's route and allocation of checkpoints about 4-5 pm.

Visitors to us were Dave VK4KIX and Bill VK4WL. Local hams also made contact over the period with Gary VK4ABW, from Townsville, making contact via RTA –over 200 kms!

A long wire was trialled for our forth-coming event at Cooktown for the International Lighthouse Weekend, where we will be using the callsign VI4GHL. A couple of contacts into Japan were made with JN1VXT port6 and JA3KWport6 with our signal report of 5-9.

Mike VK4MIK

VK5

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

The August meeting of AHARS was in their new venue, in the centre of Blackwood. Anyone visiting Adelaide on the third Thursday of the month is welcome to attend a meeting. If you contact the President Jim VK5NB or the Secretary, Leith VK5QH they will give you directions to the new hall. Meetings start at 7.30 and end at about 10.00.

The speaker for this meeting had to be changed at the last minute but the substitute was extremely interesting and informative, with many ideas that could be used by others.

Sasi, now VK5SN has held many callsigns. He is Singapore born and, particularly as a student, he lived in a number of flats and apartments where it was impossible to erect an antenna for HF. The amazing variety of ways lengths of wire can be extended or draped around so as to be almost invisible, yet also to work as aerials was illustrated with some excellent photos and diagrams projected onto the screen.

He almost exclusively used very low power, QRP and what he called "stealth" power but made contacts with stations around the world that way. Perseverance and skill paid off handsomely. He has since then met a number of his contacts and they have become firm friends. Amateur radio is a great hobby for people in all walks of life and an ideal way to "meet" people from other parts of the world.

Sasi was to have spoken at the meeting in September but he had obviously prepared his talk in advance so was able to present it at short notice.

At the conclusion of the meeting plans to undertake a number of aerial projects were discussed and will probably go ahead in the next few months. Listen out for the results.

The Fleurieu Group

Even though in winter many people travel to warmer climes, there were 14 at the luncheon in August.

The group is just the right size for everyone to be able to talk to everyone else quite easily, and we are fortunate that, as long as we finish eating by 2.00, the hotel does not mind how long we sit at the table.

Some of the attendees live in the Victor Harbour/Goolwa area but those that travel down there have pleasant views to see on the way through the Adelaide Hills. Perhaps it is not so surprising that so many meet every three months.

News from...

VK6

Will McGhie VK6UU
will2@iinet.net.au 08 9291 7165

A bit more history 1922

We pick up the reading of the VK6 WIA meeting minutes of the first meeting on the 25th of January 1922 at the Perth Observatory. Apart from some council business the meeting was a tour of the Perth Astronomical Observatory with the meeting closing at 11PM.

February's council meeting at Warwick House (council meetings preceeded the general meeting) called for volunteers to "construct apparatus and cabinet for a wireless set for the Institute." Volunteers came forward at the general meeting and it was decided to meet at Mr Coxon's house to construct the transmitter. The cabinet was to be constructed by a volunteer working bee at Mr. Steven's house. Mr Coxon lectured on long range receiving of European stations.

March's meeting heard reports on the progress of the WIA wireless set. Most of the meeting was given over to questions on popular scientific subjects and a discussion on the difficulty of language among wireless operators. Questions on wireless topics included information about valves, receiving circuits, sizes of tuning coils, condensers and aerials.

April's meeting passed a motion to subscribe to the journal "Electrical Times". A motion was carried "to allow members to transfer from one state to another provided that clearance be given by Secretary." An interesting entry is "A letter of thanks be sent to the Secretary NSW Division thanking him for forwarding syllabus and asking what power is being used as it may be possible for WA amateurs to hear concerts." I gather the syllabus means program of a concert being transmitted from NSW, frequency unknown. Also "the Secretary was asked to write to the Victorian Branch to ask if anything further was done re deputation to Prime Minister re transmitting licences."

May's council meeting admitted 3 new members. A letter was to be sent to the South Australian Division asking if they had heard of an item in the "West Australian" re amateur licences. The lecture repeated the lecture on "time".

June's council meeting passed a motion to write to the Prime Minister similar to the one sent by the South Australian division. At the general meeting Mr Holt read his Presidents report and was returned as President.

July's meeting read a letter from the Victorian Division which asked us to "ratify their actions as defined in Conference report and to give them power to act for us." A motion was passed after considerable discussion that the West Australian division support the request from the Victorian Division. The lecture was on Solar Eclipses.

August's meeting welcomed four new members and set new membership fees. They were 10/6 for members, 5/- for cadet members and 5/- for country members unable to attend meetings. A letter was received from the Secretary Trans Pacific Radio Test Committee "asking our co-operation in conducting Trans Pacific tests." It was agreed to co-operate but to explain that "we have done nothing in 200 metre line yet." This is the first minuted mention of a frequency. The 200 metre band is in the current AM broadcast band and just below our 160 metre band.

September's meeting welcomed two new members and finalised the membership fee of 5/- for country members who could not attend meetings, These country members would be at the discretion of Council. The lecture was on "early experiences with Wireless." Early experiences of Wireless in 1922!

October's meeting moved to "arrange all details for a radio concert and exhibition." One application for membership was followed by a lecture by Mr Nossitor "on the Wallal Expedition. This proved very interesting and being illustrated with lantern slides made it one of the best lectures yet delivered." Just what was the Wallal Expedition? Was it amateur radio related? An internet search located Wallal on the on the Eighty Mile Beach on the north west coast of Western Australia some 1,500 km north of Perth, a very remote location way back in 1922. Further information came from Mark (VK6LZ & VK6ZLZ's son) that the Wallal Expedition was to observe the Solar Eclipse of 1922. Mr Nossitor was the Assistant Astronomer with the Perth Observatory. The Expedition travelled to Wallal Downs (a cattle station) by boat. The Perth Observatory has 1923 as the Solar Eclipse but I'm sure that's wrong.

Next page is a report on arranging the Wireless concert and Exhibition for 1st December 1922. From the minutes; "Adults 1/- Children 6p, Secretary to arrange with Taxation department re tax and to write Amalg Wireless and Controller of Wireless for permission. Also to write to H M (Head Master) Perth Boys School to obtain use of hall. Also to see Insp of Police re railings etc." The program:

7.30PM doors open
8.00PM Official opening
8.00PM Radio concert
8.45PM High frequency display
9.00PM Address by Head Master
9.15PM Demonstration ?
9.30 to 10.15PM Radio concert.

November's special council meeting at Perth Boys School further discussed the Radio Concert. Also a motion that "Mr Coxon be congratulated on his success in transmitting a distance of 160 miles." There is little mention in the minutes on technical matters but this 160 miles helps put the time period in perspective and how difficult and different radio communications were. The normal Council meeting and General meeting at the end of November admitted four new members further discussed the Radio Concert.

The December council meeting moved that reports of the concert be sent to "Sea Land & Air", "Electrical Times" and "Wireless Weekly". Letters of thanks to all concerned with the Radio concert were to be written. Two names were to be submitted to the Radio Inspector to act as Hon Radio Inspectors.

A motion in the December minutes is worth reproducing as written. "That a valve be purchased at a cost of (pound) 1/5/0 to replace one stolen from MrMcKinley's set during the Exhibition." The (pound) 1/5/0 equates to about $100 in today's money (at a guess).

VK7

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

VK7 Officially Changes from GMT to UTC

In the first week of September a bill was introduced into the Tasmanian parliament to move from Greenwich Mean Time to Co-ordinated Universal Time (UTC) in the Standard Time Act 1895.

VK7 BPL trail starts

Aurora Energy launched their commercial 6 month trial in the week beginning 12 September and a complaint has already been lodged with Aurora and the ACMA from Conrad, VK7HCK. The level of interference experienced in the Mt Nelson trial area has prevented him from operating on the HF bands. Watch this space! Measurements of this interference using Owen Duffy, VK1OD's FSM software are being taken and sent to the WIA for analysis.

If you believe you are being affected by BPL interference we suggest you take a listen to the sound files that are available on the REAST website. If these match the type of interference you are experiencing, and you wish to make a complaint then report it to the Aurora Energy, BPL Project Manager, Piero Peroni on Telephone: (03) 6237 3134 or Email: Piero.Peroni@auroraenergy.com.au and to the ACMA Regional Office in Melbourne on Telephone: 1300 850 115 or Email: saro@acma.gov.au

We encourage all amateurs and interested people to take a look at the REAST website and familiarize yourself with BPL technology, what it sounds like on the air and what it looks like on the poles.

Silent Key

Stephen Courtney-Pratt VK7ZSP passed away peacefully in early September. RIP.

North West Tasmania Amateur Radio Interest Group

Re-installation of the VK7RAE 6 m, 2 m, 70 cm & 23 cm beacons in their new location in the 7AD/SEAFM transmitter facility at Don Heads is progressing well. Andrew, VK7XR and Tony, VK7AX have installed the hardware and masting in preparation for the final commissioning. Thanks are due to Joe VK7JG for repair of the 70 cm beacon recently and the fitting of crystal ovens to the 70 cm and 6 m beacons thus improving stability of the beacon frequencies.

Northern Tasmanian Amateur Radio Club

From all reports the wine tasting/ appreciation night went well and not too many hangovers were experienced, post the event...HIHI! JOTA this year looks to be very well supported in the North with a meeting to discuss this year's event attracting 9 people at the QTH of Tony, VK7YBG.

Radio and Electronics Association of Southern Tasmania Inc.

A big 'Get well soon' to Danny, VK7HDM, who was involved in a very serious motor bike accident in August. Our thoughts are with you Danny and Denise, take it easy and get well soon.

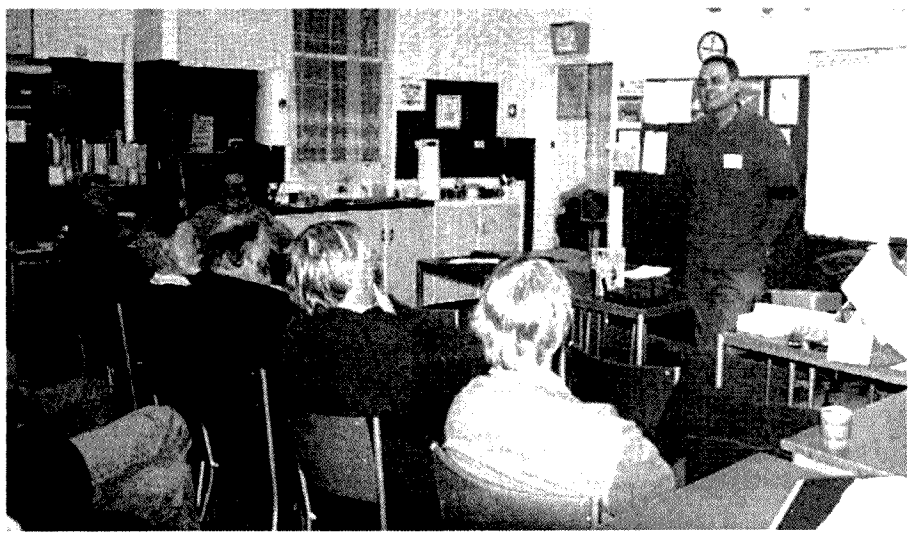
REAST are supporting three scout/ guide groups this year with the Huon, Wellington and Clarence districts involved. Contact Rod VK7TRF or Roger VKXRN to assist with this wonderful opportunity to showcase ham radio to all those young people.

Four REAST members, Stu, VK7NXX, Peter, VK7TPE, Roger, VK7XRN and Ray donned their southwesters and headed for a location close to the Iron Pot Lighthouse for International Lighthouse weekend. Propagation was variable. However, 13 VK and one ZL lighthouses were contacted

WICEN successfully assisted with the communication on the Mt Lloyd Rally, part of the Tasmanian Rally Championship, run in the Maydena forests on the last weekend in August.

We thank Murray, VK7ZMS for providing REAST with a very interesting talk on the extensive Wireless Local Area Network (WLAN) that is being installed around Southern Tasmania. This 2.4 and 5.8 GHz network demonstrates the combining of both computer and radio technology. It was great to see so many people along to the night.

ar



Murray, VK7ZMS giving the "low-down" on WLANs

Awards

Malcolm K. Johnson. VK6LC
W.I.A. Awards Manager

WIA 9 & 11 Band DXCC Awards, Official Release.

"Special issue only"

The WIA officially releases its new special issue 9 & 11 Band DXCC Awards complete and invites submissions for these Certificates.

We, the WIA, have the honour of being the first in the world to offer a complete DXCC range of awards.

Our awards have been developed to specially reward our present day DX Masters right here in Australia and catering for our next generation of "Master Dxers" and beyond 2020.

The 9 & 11 Band DXCC program has taken the WIA just over six months to develop, finance and deliver these new exciting challenges to our membership.

This completes our DXCC range of awards from Single Band to 3, 5, 9 and 11 Band DXCC.

They will extend into a new Multiband Program that includes all 11 approved bands including VHF.

New administration rules have been established and approved by the WIA Board of Directors.

The Australian DXCC "entity" bench marks were also reviewed for all multiband awards.

The awards have been developed incorporating sponsored, financial and legal graphic support.

These awards are not difficult to achieve, but they will require many hours and years of dedication in DXing and QSLing.

9 Band DXCC (9BDXCC)

"DX Master Award"

This Certificate includes any choice of 11 Band-modes from 2m to 160m.

They are available in Single or Open Awards. Deleted entities do not count for this award.

Honour Roll bench mark is set at 1508 and DXCC Excellence bench mark is set at 2110.

Individual progress award achievements are from 900 to 2200 entities.

11 Band DXCC (11BDXCC)

"DX Supreme Award"

This Certificate includes all of the 11 Band-modes from 2m to 160m.

They are available in Single or Open Awards. Deleted entities do not count for this award.

Honour Roll bench mark is set at 1758 and special dispensation for VHF 2m. and 6m. set at 125.

DXCC Excellence bench mark is set at 2410 and special dispensation for VHF 2m. and 6m. set at 150.

Individual progress award achievements are from 1100 to 2500 entities.

See inside back cover for colour prints of the new 9BDXCC and 11BDXCC certificates

MultiBand DXCC Program (MBDXCC):

Our current DXCC single band "DXCC Standings" will be joined by the new "MultiBand DXCC Program" this will extend the performance over all bands. This new program should be ready for publication by the end of this year. The simple format will be to totalise all bands.

The minimum entry is 100 confirmed entities "Open" for each respective Band, excluding deleted entities.

Certificates

Our Special Issue certificates will only be produced as required and no stocks will be carried. When achieved they will be specially printed on a one-off basis. These are truly outstanding, colourful and have a world class identity, the best we have ever been able to produce. All of these awards are graphically designed for A4 (210x297) with an extended border to A3 (297x420) thickness 250gsm Colortech. Progress achievements labels are from 1300 to 2600 in increments of 100 entities, Honour Roll and DXCC Excellence self adhesive award labels are all designed complete for these awards.

The costs of these awards are listed and shown separately on the "Award Fees" page of the website.

The WIA Awards are the leading edge with this program, setting pace with the world and creating a mile stone for our National Radio Society 2005. You can also be very proud of this.

I thank our progressive WIA Board of Directors 2005, our financial sponsor "VK Classifieds" , certificate image sponsors Australian Bureau of Meteorology and "SSEC/UW-Madison" for their contributions.

These new certificates can be viewed on the National website along with all down loadable application sheets.

For those who prefer manual applications this package can be printed and posted at a cost.

Website: http://www.wia.org.au/awards/

email: awards@wia.org.au

Postal address: POB. 196, Cannington. 6987. Western Australia.

Please enjoy your DXing, be very proud of your achievements and display your award with pride.

ar

Spotlight on SWLing

Robin L. Harwood VK7RH.

Katrina's fury

The city of New Orleans along with most of Louisiana, plus parts of Mississippi and Alabama were hit by a severe hurricane on the 29th and 30th of September. It was called "Katrina' and thousands of people were killed, mostly from the surge that followed the hurricane when the levees broke their banks and flooded over 80% of the city.

Although warnings were issued prior to the arrival of Katrina, tens of thousands were trapped, unable to escape the fury. Law and order quickly vanished and anarchy reigned for many days until the National Guard plus other military assets poured into the devastated Gulf region. The whole city was eventually evacuated and this in itself presented a massive logistics nightmare. At deadline time, they have stated that it is going to be at least seven to nine months before people will be able to return.

Hurricane Katrina destroyed the communications infrastructure and both amateur and military networks quickly sprang into action. The amateur radio networks were quickly overloaded passing health and welfare traffic whilst the military were mainly concentrating on relaying government and other related services. These networks were heard easily here in Australia.

Because of Katrina's severity, all of the major radio and television networks within the region pooled their resources. Also one of the domestic American shortwave networks, World Harvest Radio in South Bend, Indiana, relayed this coalition to the wider US and to the entire World. I was hearing them well on 5835 at 0600 and it appeared to be an Internet feed as it was up to 70 to 90 seconds behind the MW stations.

Marine HF stations such as WLO in Mobile Alabama and WNU in Slidell LA were temporarily out of action as was the primary US Coastguard Commstat in New Orleans. Other coastguard assets were quickly brought into service to fill in the gaps. Religious broadcaster, WEWN in Irondale Alabama was mostly unaffected being further inland. The inactive WRNO transmitters and antennas were destroyed and are not likely to be replaced.

At the end of this month, daylight saving ends in Europe and North America on the 25th. This coincides with the southeasten states of Victoria, NSW and SA advancing their clocks. NZ and Tasmania advance theirs on the 4th of October. October 25th is also the date when broadcasters and other communication users change over their frequencies to compensate for altered propagation. I am also informed that there will be more DRM transmissions on the band.

Well that is all for this month. Until next time, good listening.

ar

ALARA

Christine Taylor VK5CTY

The ALARA Contest

Wasn't it fantastic? The conditions on air were the best anyone can remember. There were almost no atmospherics. No matter where you were you could hear on 80-metres and be heard almost perfectly. What great conditions for our thirtieth anniversary year.

I do hope you entered. I hope all YLs and most OMs entered the friendly Contest. There was time to have a natter and exchange news and weather conditions, just as we do on the Monday night Nets each week.

The triple points available from the few early members in the Contest were another bonus this year. I heard two of the early members but I know there were one or two more. Remember to record those extra points. It could make all the difference.

Unfortunately I was otherwise engaged during the day so I didn't find any of the distant X stations although I heard that there were several on frequency. Maybe you were more fortunate than I.

Now all that is left is to write up your log and send it to Marilyn VK3DMS through alaracontest@wia.org.au

Another reminder

If you made contact with Gwen VK3DYL or Elizabeth VE7YL this year, on the Islands, from Vanuatu or Tonga, using YJ/Yl or A35YL, do remember to send your logs to Gwen through the QSL bureau or direct. She is busy writing out those she has received and would love to have more.

Propagation conditions were not great but quite a number of QSOs were made.

Again, reluctantly, Gwen has to admit CW does get through under bad conditions when voice simply does not!!

While we are thinking about logs for ALARA, why not do the same with your Remembrance Day logs. I am sure the Contest Manager would like to have ALL the logs this year.

A bonus for everyone

If you have made contact with ten or more VKYLs and there were five or more states among the callsigns you can claim an ALARA Award. Just send a copy of your list to the new Awards Manager, Kathy VK3XBA using kathyg@spacelink.com.au along with $A5 or 4IRCs and she will be delighted to send you the very attractive certificate.

The certificate has hand-coloured state emblems surrounding the information, so will be a decorative addition to your Brag Wall.

The contacts you claim can be from the ALARA Contest, or one of Gwen's International DXpeditions, or just through normal contacts on air. They cannot be through repeaters or part of a NET but YLs on the Monday Nets are always willing to stay back at the end of the Net to give you the extra contact you need.

The ALARAmeet in Mildura

Many YLs are preparing to be in Mildura soon for the ALARAmeet and by the time this column appears it will all be over. The only thing over which there is no control is the weather, so I will let you know what that was like next month.

To anyone who thought about it but didn't go this time, I say, try even harder to be there next time. You will have a great time meeting people you have heard on air or heard about. At my first ALARAmeet I was still a Limited Licensee, so I had never spoken to anyone from interstate, before. I met YLs there who are still my friends. It happens!

The 222 Net

Although we are not at a good part of the propagation cycle, judging from the conditions during the ALARA Contest, there should be a number of the DX stations able to be heard.

Certainly I recommend you listen and participate in the 222 Net on Monday afternoon at 0530 Zulu before Daylight Saving comes around. That seems to upset all our calculations because the times change on both sides of the world at about the same time. We never know whether others have to get up earlier or stay up later to be there. So give it a go now, rather than later.

ar

Florence McKenzie Trophy presentation.

At ALARAmeet 2004 Marilyn VK3DMS, as ALARA contest manager, presents a special plaque to Pat VK3OZ. Pat won the Florence McKenzie Trophy for 4 of the last 5 years that the trophy was awarded.

Pat took the Florence McKenzie Trophy home from the Murray Bridge ALARAmeet in 2002, however the actual trophy, which is quite large, is now on permanent public display in Glenelg, SA. Pat will be able to have her new, much smaller, 'Morse Key' trophy on display where previously she had the Florence McKenzie Trophy.

ar

Bill Magnusson VK3JT

Can you help the AMSAT Website Technical Review Team?

The satellite scene is very dynamic these days. The AMSAT-NA website contains, along with breaking news, plans for new birds, information regarding long term projects, satellite commissioning updates, FAQs for beginners, links to other information sites and essential day-to-day data for all users. It's a wonderful resource for newcomers and experienced operators alike. The site gathers together material from a wide range of sources and on (fortunately) rare occasions it can be contradictory. Recently some inaccuracies have been pointed out in some of the technical material on the web site. A full check is well beyond the capacity of any individual so, in response to members' concerns a "Website Technical Review Team" had been assembled to look into the matter. This announcement was made in August and it's worth including here in full. Take particular note of the appeal near the end. If you become aware of any technical flaws in the material on the web site, I'm sure the team would like to hear from you. Proof reading is an onerous task at any time and technical proof reading is even more so. Sometimes something can slip by even a 6-strong team of "eagle-eyes". Here is the announcement.

Barry Baines, WD4ASW, AMSAT's VP-Marketing & User Services is pleased to announce that our Website Technical Review Team, under the leadership of Gould Smith, WA4SXM has been formed. Gould serves as Director-Field Operations and is the author of a number of AMSAT books. He is well qualified to handle this important task with the assistance of a very capable team that he has formed. The team that Gould has developed consists of AA2TX, KO4MA, KQ6EA, N8FGV, and VA3DB. The team has begun a systematic look at the content of the AMSAT website for technical issues, and is assigning a priority to identified items. The first areas the team is addressing are the Glossary and the Mode J operation articles. When appropriate, they will seek input from other individuals who may be knowledgeable in particular areas. Two members of the team will OK articles for technical content with final approval from Gould before he forwards them for inclusion on the website. "Our team is excited about updating the technical content of our website" says Gould Smith, WA4SXM. "However, this will take some time and will require thoughtful evaluation. In looking at the Glossary for example, we have found through our initial research that even the experts sometimes disagree on proper definition of technical terms. We want the AMSAT website to be a trusted and reliable source." Emily Clarke, W0EEC serves as Director-Website and will be working closely with Gould to implement changes as they are developed. Should website visitors wish to suggest areas of current website technical content for the team's consideration or be interested in submitting suggested technical changes or updates, they can do so by contacting Gould Smith, WA4SXM using his AMSAT e-mail alias. Please put 'Website Technical Review' in the subject line. The above was submitted by Barry, WD4ASW.

Updated version of SatPC32 released.

I reviewed this satellite tracking program some months ago and decided at the time to stick with my traditional software. As is the case with all well supported software, the author has been busy incorporating suggestions from users. Result ... Erich DK1TB has now released version 12.4 of SatPC32 and it can be downloaded from the author's personal web site http://www.dk1tb.de/indexeng.htm

The new version has some interesting new features, which will appeal to many users. The setup of the SatPC32 programs has been simplified. Updating of Keplerian data has also been simplified. Some CAT interfaces don't require an external power source but are fed directly from the COM port. To power such interfaces SatPC32 can now optionally switch the RTS pin to +12 V (+5 V for a USB-to Serial adaptor).

The new version also includes a new "Sun and Moon" tracker. After SatPC32 v12.4 has been tested "in-the-wild" for a month or two the program will be made available on CD. If you encounter a bug in the 12.4 version, please immediately inform Erich, DK1TB by email dk1tb@amsat.org. He has generously donated SatPC32 to AMSAT-NA, AMSAT-UK, and AMSAT-DL. If you use SatPC32, please purchase a registration code from one of these groups. All of the purchase price will go to support amateur satellite programs. Note: The "demo" version requires the user to enter the station data each time you start the program. Otherwise it is fully functional. The download file is about 10 Mb long.

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

"Oh to be in England now that SSETI's there"

With apologies to Robert Browning

Howard G6LVB made this announcement last month prior to the launch of SSETI Express.

"In recognition of the effort put in by AMSAT-UK into the SSETI Express mission, I am delighted to announce that interested parties from the amateur satellite community have been invited to attend the launch event in London at the Institute of Mechanical Engineers at 1 Birdcage Walk, SW1H 9JJ on the morning of 27 September 2005. There will be live video feeds from the launch site as well as an attempt to receive signals from the satellite itself, due to be overhead and transmitting (if luck is on our side!) about 2.5 hours after launch. Although the launch is scheduled at 06:52:26Z (07:52:26 local BST), there will be replays of the launch during the morning. Best of all, it's free!".

Thanks Howard, I include this in the column for interest sake as the event will be over by the time this column is read. I hope it was well attended. I for one would loved to have swelled the ranks too. Great venue, pity it's half a world away.

By the time this column is in the hands of readers SSETI Express will have been launched and should be undergoing commissioning. We wish it well and hope it will eventually contribute to amateur radio satellite communications.

Congratulations to the workers at AMSAT-UK who stepped in at short notice to help make it all happen. The SSETI Express project drew heavily on the expertise of a number of senior AMSAT personnel during the early planning stages and again towards the end. The above event and the item below indicate that the effort did not go unnoticed.

Details of the SSETI Express telemetry download competition

Recently it has been mooted that some sort of telemetry download competition might be conducted in conjunction with the SSETI Express launch. The worldwide amateur radio satellite community represents a huge resource for the capture of telemetry information. The competition should encourage a wide response and a very worthwhile prize is being offered. Here are the details as released by ESA a couple of weeks prior to the expected launch date. The message was posted on the AMSAT-NA bulletin board by Graham G3VZV on behalf of AMSAT-UK.

"The Education Department of ESA, the European Space Agency, is delighted to announce details of the award that will be offered to the amateur radio community in relation to the downloading of telemetry from their SSETI Express student built satellite.

The award will be given to the amateur who submits the largest number of valid telemetry and payload packets regardless of which band it is received on.

SSETI Express is scheduled for launch on September 27th from Plesetsk in northern Russia at approx 06:52 UTC. It will downlink telemetry and payload data in AX25 format at 9k6 on 437.250 MHz and at 38k4 on 2401.835 MHz. It will later also be available for radio amateurs to use as a single channel FM transponder.

All radio amateurs around the world are encouraged to download the necessary software from the www.sseti.org/express website and to use the SERACC system to forward the telemetry and payload data to SSETI Express Mission Control. Submissions will be automatically recorded and the leaderboard will be shown on the website.

The winner will have the opportunity to visit the STEC06 Conference and Exhibition in Germany in Spring 2006. STEC, the Student Technology Education Conference, follows previous events in 2004 in Lausanne in Switzerland and in 2005 in Aalborg in Denmark. The three day event is similar to the AMSAT-NA Symposium and the AMSAT-UK Colloquium but with more breakout technical sessions in addition to the Keynote Speeches. The meetings are interesting and thought-provoking and enjoyed by all the attendees.

The post meeting attitude adjustment sessions have also proven to be exciting. The winner will also be encouraged to present a paper on how he/she achieved their success - but this is not mandatory! In addition to attending the STEC 06 Conference, the winner will be invited to visit ESA's Mission Operations Centre - ESOC - near Darmstadt in Germany where they will be given a private escorted tour of the facilities. ESOC currently controls the many exciting orbital and deep space ESA missions and will be responsible for the European Columbus module when it joins the International Space Station.

For more information check http://www.stec2005.space.aau.dk/. To see what this year's event included and for a few details of the ESOC facility, visit http://www.esa.int/SPECIALS/ESOC/ The winner will be the amateur at the top of the leaderboard at 00:00 on Jan 1st 2006. The prize will include economy class travel from your home, accommodation and a small daily subsistence allowance".

AMSAT-UK wishes to congratulate and thank ESA for their generous prize, a first in the field. It will add to the enthusiasm for the SSETI Express project that already exists within the amateur radio community. It will be a great opportunity for us to demonstrate that the amateur radio groundstation "network" is a valuable resource for satellite projects, which are able to include useful amateur payloads.

PCsat2's PSK31 tests users to the limit

The PSK31 feature on PCsat2 is proving very popular, but it represents a huge challenge. PSK31 is an unfamiliar mode to many operators and to fully understand this challenge you need to be familiar with PSK31 as a mode and also the problems of accurately tuning for changing Doppler shift in satellite operation.

PSK31 is one of the "sound-card" modes where most of the clever stuff goes on inside your computer. It is commonly used on HF where it has enjoyed some advantages over CW and other digital modes. This situation is changing, as more and better digital modes become available. In essence it creates a narrow passband around the received frequency.

The passband is confined to the combined audio response of your

receiver and the computer sound card. In general this amounts to about 3 kHz. The bandwidth of individual signals within the passband is very narrow, typically around 31 Hz, hence the mode name. There is plenty of room for a dozen or more contacts to be going on in this passband even if everyone's transceiver is tuned to exactly the same frequency.

The mode lends itself to applications where limited bandwidth is an issue. Efficient use of available bandwidth is always an issue in satellite operations. Stability and accurate tuning is a must for successful PSK31 operations.

Herein lies the challenge. Signals from all satellites are Doppler shifted to some degree. In the case of Low Earth Orbiters (LEOs) we have a worst case scenario. PSK31 is intolerant of any frequency changes outside a few Hz. If you have tried to conduct a contact on SSB over a LEO you will appreciate that you may need to devote one hand permanently to tuning the signal to keep your contact on the original frequency. Trying to do this manually has proved to be very difficult indeed and much thought is being devoted to solving the problem using computer automation. Software has been developed recently that can cope with an SSB contact on even fast moving LEOs but so far no-one has come up with something to make PSK31 a breeze. The current software and indeed the current batch of radios just aren't up to the job.

Here is part of a discussion, which has been developing on the AMSAT-NA bulletin board on this very subject. I think it will go some way to revealing how difficult the problem is for software developers. But it's challenges like this that spur amateurs on to do the necessary head scratching. Perhaps in the near future we will have software to cope with this situation and another mode will be added to our armory.

We are indebted to Bob Bruninga for his foresight in giving PCsat2 its PSK31 capacity. In this message, Peter G3PLX has set out some of his thoughts on the matter. It's great to be able to watch the development of new ideas and new software as they happen. Over to Peter.

"Quite a bit more activity today (on PCsat2), but as far as I know, no two-way QSO. Most stations still seem to be mesmerised by hearing their own signals drifting far faster than they can handle, and have not yet moved on to the problems of simultaneously receiving another station. I predict that there will very soon be a demand for Doppler tracking aids that can handle the PSK31 uplink Doppler correction requirement.

There are several ways this could be done. If we just think of using existing Doppler correction software, then it needs to handle a step size of the order of 1 Hz and a Doppler rate of about 14 Hz/sec maximum (for ISS). I suspect that this may be beyond the capabilities of some of the presently available programs, and may be beyond the ability of some presently available transceivers.

The stepsize and the update rate are the problem areas. At least one station has tried with a 10Hz stepsize system and it's not workable. If a 1 Hz stepsize radio existed, it would need to have its frequency updated at least 14 times per second.

Another solution is to extend the capabilities of the PSK31 programs. One way to do this would be to incorporate a link between such a PSK31 program and an existing Doppler tracking program, so that the PSK31 program can slide the transmitter audio tone frequency up in the required manner. The tricky part here is that we still need the 1Hz stepsize and the 14 Hz/sec rate, and, as I said above, the current Doppler tracking programs may not have this resolution.

One way round this might be for the PSK31 program receiving the Doppler data, at for example 10 second intervals, to interpolate between the frequencies provided in order to 'smooth out' the frequency of the transmit audio tone. This might require that the Doppler program calculate frequency values ahead of time, for example 5 secs ahead if the PSK31 program was going to linearly interpolate over 10 secs. This solution would be limited to uplinks where the total Doppler swing was less than about 2.4 kHz, in practice to uplinks below 30 MHz. Both of the above solutions are 'open loop', and could be applied to automated uplinks.

Another way to solve the PSK31 uplink Doppler correction requirement is the way I am doing it, where the transmitting station feeds-back the Doppler correction from reception of his own downlink signal. This solution is unique to the linear-up/FM-down transponder scheme and can be implemented entirely in software for uplinks below 30 MHz. The advantage is that it doesn't need Keplers but the disadvantage is that it does require the sender to transmit continuously, and QRM of the sender's downlink can disrupt the tracking, so it's not a solution that can be applied to an automated uplink, only to a manually-operated one. I have verified that a second-order AFC loop is quite capable of handling any Doppler drift likely to be experienced. This kind of loop is not stressed by Doppler drift rate itself but there are limitations on the double-rate-of-change of Doppler that such a system can handle. The maximum that PCSAT2/ISS presents for this parameter is +/-0.23 Hz/sec/sec on an overhead pass. There are two critical points about 25-30 seconds each side of TNA.

My scheme would appear to handle this well on a simulated signal, but since I never get an overhead pass from the ISS here, I can't verify that on the real ISS. The worst I experience is 0.14 Hz/sec/sec. I believe we should actively solicit designers/programmers to tackle this project urgently, drawing attention to the problem and providing the details needed to make sure that these guys can come up with usable solutions within the lifetime of PCSAT2. If we don't tackle this soon, I think the users will migrate away from PSK31 on PCSAT2 and swap to other wider-bandwidth modes where the Doppler shift problem does not need to be solved. The result will be a far less efficient use of the transponder bandwidth.

I do not have the capability or desire to do this kind of mass-market software myself. I am just an experimenter. I am very willing to pass on the results of any of my experiments to others. This is how I worked with the original PSK31 systems. I just demonstrated that it could be done (in software on a soundcard/PC), and the end-user programs were written by others far more skilled in this task than me".

Thank you Peter for some valuable food for thought. Congratulations on your past record. Here's hoping someone with the necessary skills will rise to the occasion this time. In closing Peter asked that his ideas and appeal for ongoing help and interest be publicised where possible. Consider it done!.

ar

Over to you

A word of thanks

Having my article on DRM published in the August AR has brought to my attention in a new way just how much effort you put into the publication of AR each month. It is easy for us on the receiving end to take all your efforts for granted.

I know I wait for AR to be delivered each month but normally do not give much thought to the effort needed to produce it month after month.

So just a brief note of thanks, appreciation and encouragement.

I have received quite a few comments from fellow amateurs who have appreciated my article. I expect the same would apply to most, (more likely ALL) the articles published each month.

Your effort is appreciated, many thanks.

John L Cartmill, VK4BJ

Hurricane Katrina

You may already have seen the following and other similar reports

However I've copied it below F.Y.I. It contains elements that could be worthwhile getting into local amateur radio publications/broadcasts and the public media.

John Costa VK3JCA

As telecom reels from storm damage, ham radios hum

With Hurricane Katrina having knocked out nearly all the high-end emergency communications gear, 911 centers, cellphone towers and normal fixed phone lines in its path, ham-radio operators have begun to fill the information vacuum. "Right now, 99.9% of normal communications in the affected region is nonexistent," says David Gore, the man operating the ham radio in the Monroe shelter. "That's where we come in." In an age of high-tech, real-time gadgetry, it's the decidedly unsexy ham radio -- whose technology has changed little since World War II -- that is in high demand in ravaged New Orleans and environs. The Red Cross issued a request for about 500 amateur radio operators -- known as "hams" -- for the 260 shelters it is erecting in the area. The American Radio Relay League, a national association of ham-radio operators, has been deluged with requests to find people in the region. The U.S. Coast Guard is looking for hams to help with its relief efforts. Ham radios, battery operated, work well when others don't in part because they are simple. Each operator acts as his own base station, requiring only his radio and about 50 feet of fence wire to transmit messages thousands of miles. Ham radios can send messages on multiple channels and in myriad ways, including Morse code, microwave frequencies and even email. Then there are the ham-radio operators themselves, a band of radio enthusiasts who spend hours jabbering with each other even during normal times. They are often the first to get messages in and out of disaster areas, in part because they are everywhere. (The ARRL estimates there are 250,000 licensed hams in the U.S.) Sometimes they are the only source of information in the first hours following a disaster. The hams also get little respect from telecommunications-equipment companies, such as Motorola Inc. "Something is better than nothing, that's right," says Jim Screeden, who runs all of Motorola's repair teams in the field for its emergency-response business. "But ham radios are pretty close to nothing." Mr. Screeden says ham radios can take a long time to relay messages and work essentially as "party lines," with multiple parties talking at once. Says Mr. Leggett at the Monroe operations center: "We are the unwanted stepchild. But when the s- hits the fan, who are you going to call?"

SOURCE: Wall Street Journal,
AUTHOR: Christopher Rhoads
christopher.rhoads@wsj.com]
http://online.wsj.com/article/0,,SB112597561578132422,00.html?mod=todays_us_marketplace

Silent Keys

The WIA has been notified that the following members have recently become Silent Keys:

- Robert Leslie Parnall VK3TLC (Moe, VIC)
- Stanley John Hutchison VK2FFF (Mona Vale, NSW)

Contests

Ian Godsil VK3JS
WIA Federal Contests Co-ordinator

Contest Calendar October - December 2005

Oct	**1**	**PSK31 Rumble**	**(PSK)**
	1/2	**Oceania DX Contest**	**(SSB)**
	8/9	**Oceania DX Contest**	**(CW)**
	10	**10-10 International Day Sprint**	**(All Modes)**
	15/16	**JARTS WW RTTY Contest**	**(RTTY)**
	16	**Asia-Pacific Sprint Contest**	**(CW)**
	16	**RSGB 21/28 MHz Contest**	**(CW)**
	29/30	**CQ WW DX Contest**	**(SSB)**
Nov	**12/13**	**Japan Intl. DX Contest**	**(SSB)**
	12/13	**Worked All Europe DX Contest**	**(RTTY)**
	12/13	**Spring Field Day**	**(VHF+)**
	26/27	**CQ WW DX Contest**	**(CW)**
Dec.	**26 to mid-Jan 06**	**Ross Hull Memorial VHF Contest**	**(VHF+)**

Greetings to all Readers

Last month I asked you to start thinking about the future of contesting in VK and mentioned some starting points.

This month I would like to refer to a letter received about mid-year from Ernie VK3CEW. Below are some of Ernie's thoughts, and there is a lot of sense in some of his suggestions.

1. " ..it is along time since the majority of VK amateurs have been anywhere near 'active enough' on any band/mode, for whatever reason, and I suspect we may never see a 'satisfactory' level of participation again."
2. "In terms of contests, I frankly think there are TOO MANY small, almost insignificant, VK contests.

   We should aim to make a couple of them meaningful to THE WORLD – for instance the Oceania, RD, ANARTS (for digital folk) and leave it at that. Ensure they are all scored correctly by all major logging programs and ensure entry is only (yes, only) by electronic means, so they can be scored and results published sooner rather than later. Make them 48 hour jobs to cater for a worldwide audience."
3. "I should also add that I would keep the John Moyle, with GREATLY IMPROVED AND COMPUTER-CAPABLE SCORING as our major field day-type activity."

Again I ask you to think about the points raised and to offer support or alternative suggestions – remembering that we can do two things to further contesting over the next few years: (a) we can do nothing, let things continue as they are (a very easy option at any time, and one which will probably see the slow running down of the present system); or (b) make some changes over the next year or two and keep refining until we have something that seems to appeal to as many as possible.

To coin a phrase:
Please don't delay,
start thinking today.

Oceania Time is with us again. As you know, the Oceania DX Contest is currently THE world-wide DX contest to interest overseas stations in our part of the world. The operators are there, they just want to hear from US.

Being a WW DX contest, the contest loggers support this event and it is a requirement that logs be submitted in the Cabrillo format. The loggers will do this for you, so please get used to using one. If you don't know where to start, try Super Duper (SD) available from http://www.ei5di.com This is a Windows program, as are most of the other contest-specific loggers. However, many shack logging programs also have a contest module which may well be suitable for DX contests. Good luck and good contesting.

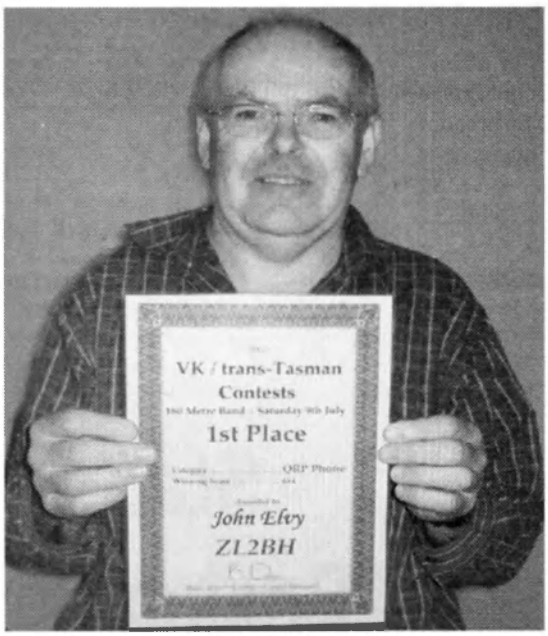
73, Ian Godsil VK3JS

Trans-Tasman winners

Bruce Renn VK3JWZ,
Contest Manager

1st ZL - 160 m Phone. ZL2AS Multi-operator station, Branch 13/Taupo, comprising (from left to right) - ZL2CF Colin Lee, ZL2VM Michael Bull, ZL2DW David Walker

1st 160 m CW, won by VK2AYD, David Pilley, Wauchope, NSW

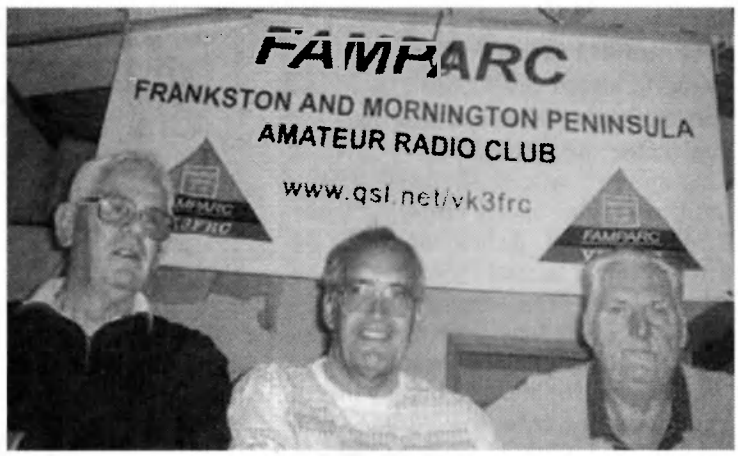


Winner of the 160 metre QRP Phone Category, John Levy, ZL2BH. John can't remember ever winning a prize in a Contest before, and was very surprised to win this one.

The 2005 VK/Trans-Tasman Contests, 160 metres Trophy Winner for the second consecutive year was Ron Tremayne VK3IO from Cockatoo with a Single-operator score of 2203. He was Equal 1st with VK7CHT from Bruny Island, with a Multi-operator score of 2232.

The Trophy was awarded under the "Multi-operator Rule" requiring VK7CHT to beat Ron's score by 100+, to win the Trophy. Both stations were awarded a Certificate for "Equal 1st".

160 metres Trophy Winner, Ron Tremayne VK3IO



VK3FRC multi-operator team (led by Roy Seabridge, on right), who were 3rd 160 m Phone.

Additional photos of place-getters will be published on the Contest URL, http://home.iprimus.com.au/vktasman, as they come to hand.

ar

JOTA 2005

October 15 /16 2005

DX News & Views

VK4OQ,
P.O. Box 7665, Toowoomba Mail Centre, QLD 4352.
E-Mail john.bazley@bigpond.com

Andaman and Nicobar Islands

Andaman and Nicobar Islands were in the 'top ten' most wanted list for many years, and after the recent Amateur operation there are still many who still need a QSO. Encouraging news has been reported from several sources. It is beginning to look as though we may expect amateur activity from the Islands again next year, if a Hamfest takes place as planned.

Government officials who, along with Bharathi, VU2RBI and NIAR representatives, attended Dayton Hamvention 2005 and Hamradio 2005, held at Friedrichshafen, have made favorable proposals to the Government of India, to further promote amateur radio activity in that country, to include permission for foreign amateurs to operate from VU4 and VU7 during a planned Hamfest and also thereafter. The officials now wish to know, from NIAR, how many amateurs will seriously consider attending such a Hamfest, if it is organized in these Islands.

NIAR are proposing to stage a 3-day Hamfest in Port Blair, Andaman Islands between 25 December 2005 and 10 January 2006. NIAR asks amateurs interested in attending to e-mail Prof. Ram Kapse, Lieutenant Governor, Andaman and Nicobar Islands, Port Blair, India (lg@and.nic.in, ramkapse@and.nic.in), and please also send a copy to NIAR (vu2nro@gmail.com)

NIAR says that "all requests to operate from the Andamans and Nicobar that are sent to the Lieutenant Governor of A&N should very clearly express the wish to operate from A&N as an important motive to visit A&N for the Port Blair Hamfest. A permit to operate from there, as a foreigner, will depend on the number of requests the Lieutenant Governor receives".

It will be interesting to see how this develops.

So what have we got to look forward to in October, particularly with CQWW SSB Contest taking place during the last full weekend of the month. A number of DXpeditions have already announced their plans and undoubtedly others are still in the planning stage.

What do the really serious Contest DXpeditions look for? They really want three things – good conditions (don't we all) – as many '3 point QSOs 'as possible (that is stations outside their continent) and Country and Zone Multipliers. If you are going to participate seriously then I believe the old adage still applies ' go for bulk on the first day and quality the second'.

For those of us who are chasing new countries, Contest DXpeditions offer a big advantage compared to the 'normal' DXpedition, as the participants will endeavour to operate for the whole 48 hours of the Contest as every QSO counts. The non-Contest DXpedition on the other hand tend to concentrate on areas of population, but on the other hand occasionally you do get a group who will try to work areas for whom they know that the path is extremely difficult. For all of us there is undoubtedly an area that is very hard to work, either from a lack of amateur activity, the antipodes and/or a Polar path. This is one of the facets that makes DXing so interesting and challenging. Let us not forget those who do not like contests – they have an opportunity to work DX during contests, with less competition, on the WARC bands.

The following is the most up to date information that I can get for the Contest, up to the closing date for copy.

VP2EWX (Bill-W4WX), VP2EDP (David-WA4ET), VP2ECM (Cory-N1WON) and VP2EAZ (Clarence-W9AAZ) will operate from 25th October to 1st November including CQWW SSB.

P40W (John-W2GD), active from 26th to 30 October including CQWW SSB

From 25th October to 1st November will be activated by 8P9AS (Clint-W3ARS), 8P9DC (John-W3ADC), 8P9DX (Natham-W3ADX), 8P9HC (Hugh-WB6CBU), 8P9KS (Kamal-N3KS), 8P9LP (David-K3LP), 8P9LZ (Krassimir-K1LZ) and 8P9OP (Mike-N3VOP), they will be using the call 9P9R for CQWW SSB - QSL W3ADX.

V31MQ (Mike-WQ5C) will also be on from 26th October to 1st November and during CQWW SSB.

VK9XD (David-VK2CZ) will be active from 25th October until 6th November and participate in CQWW SSB. QSL via VK6NE (vk6ne@upanaway.com)

J3A - various operators will be active during CQWW SSB,

KG4SB or KG4WW (José-N4BAA or and Bill-KG4WW), will be active from 25th October until 5th November including CQWW SSB

8Q7 will be activated by EA1DGZ, EA1DBC EA1AAW and EA1CNF.

HQ9R – Honduras will be activated by WQ7R during CQWW SSB. He will be there from 22nd October until 4th November

JW5E (CQWW SSB) QSL via JW5NM (jw5nm@online.no

6W1RY by F5VHJ

C6A activated by W2GJ and AA4V

St Martin by FS/AH8DX

Earlier this summer on their visit to the Azores, OH2BH and OH2PM met the local gang to arrange a project for contesting during the coming season. The station call will be CU2A.

N6TJ, Jim Neiger, continues his many-year Ascension Island activities as ZD8Z, October 26 to November 5 including the CQWW SSB contest, 20 metres only. Jim will do some CW after the contest, including some WARC band activity and 160M. QSL direct to VE3HO.

NP2B will be in the CQWW SSB as a multi with ops NP2B, WD4R, W4OV, W4DTA, W1RG, K9VV and maybe others. QSL via NP2B.

CN2R, operator W7EJ, Jim, will be in the CQWW SSB single op single band 40. He'll be on WARC and 160 before and after. QSL via W7EJ.

GD6IA, Isle of Man, with ops K1JB and K1EU, will be in the CQWW SSB, multi-single. QSL direct only, to K1EU.

Special Event Radio Station OO4CLM

Postbus 1006 - B-8300 KNOKKE-HEIST - BELGIE

On November 1st 1944 the town of Knokke was finally liberated at great cost of Canadian lives. Each year the fallen Canadians are remembered with ceremonies, festivities and an "Canadian Liberation March" on November 1st and that during the Canadian Week. Many Canadian and Belgian veterans, VIPs and radio-amateurs are participating in the events.

This year the Special Event Station OO4CLM (which suffix stands for Canadian Liberation March) will be on the air for the 24th time from Friday, 4th until November 8th 2004.

As a result of 175th the anniversary of Belgium it has been permitted us the prefix OO to use.

Beside our own ham-operators the Special Event Radio Station is operated by members of the BAFARA (Belgian Airforce Amateur Radio Ass.), by members of the BMARS (Belgian Maritime Amateur Radio Soc.) and by operators of the ONZ-YLC.

Again a multi-coloured OO4CLM-Award will be available to all licensed amateurs and SWLs for any contact with this special event station. They also can get a beautiful QSL-card. Cost of the OO4CLM-Award is 5 IRC or 5 US$, with all proceeds going to a welfare fund. The money is used to maintain memorials and to keep the station OO4CLM next year in the air.

You can contact or listen to OO4CLM on the frequencies in Table 1.

Special thanks to the authors of The Daily DX (W3UR) - 425 Dx News (I1JQJ) and QTC DX PY2AA for information appearing in this month's DX News & Views.

ar

Frequencies (in MHz.) OO4CLM

	80 m	40 m	30 m	20 m	17 m	15 m	12 m	10 m	2 m
SSB	3.685	7.045		14.145	18.150	21.245		28.545	144.250
CW	3.515	7.012	10.118	14.020	18.087	21.020	24.897	28.020	144.020
FM	145.475								
URL	http://www.on4clm.be								
Email	mailto:info@on4clm.be								

Table 1

Silent key

Peter Harrison VK6HH

Peter Ernest Harrison came into this world on 11th September 1928 and left us on 11th September 2005, aged exactly 77 years to the day.

Peter's fascination with radio began early, he started off experimenting with "cats whisker" crystal receivers. His father died when he was seven years old so he was forced to leave school at an early age.

At thirteen he was a Telegraph messenger at Frankston Post Office where he taught himself Morse and typing. At fourteen he told the authorities that he was sixteen and joined the Air Service Cadets where he taught wireless air gunners and trainee pilots Morse in the back room of Frankston Post Office.

After two years of this he was ready for the Air Force. However his mother intervened as he was only sixteen. As a result he joined Vic Rail where he ended up doing about three jobs because of the man power shortage during the war years.

Finally, at seventeen he was able to join the Royal Navy as a Telegraphist and there he stayed until 1948. It was then back to the PMG as Postal Clerk and Telegraphist where he served in Adelaide, Perth and Sydney. The Department of Civil Aviation was looking for radio operators at that time, so he started his career in Civil Aviation at Rose Bay Flying Base. From there he went to Parafield Airport in Adelaide and then transferred to Melbourne after meeting me on a training course.

In 1952 during the time of the Atomic Bomb tests at the Montebello Islands, radio operators where needed in Port Hedland so that's where Peter went. After two years he was promoted to Officer in Charge of Broome Airport. In 1956 a Cyclone devastated the town and all radio installations were blown away with the exception of the airport tower. Peter was able to relay urgent messages and was the only link with the outside world for over a week.

After a period of time at Perth Airport he returned to Port Hedland as Officer in Charge from 1968 to 1970. This was a time of intense activity as the town was changing from a pastoral port to a great mining centre. Peter transferred from Perth to Melbourne in 1971 to help with the re-structure of the Flight Service Department and in 1976 moved to Dubbo in central NSW as OIC. During his time in Dubbo Peter took an active interest in the "Orana Region Amateur Radio Club" and used to instruct the beginners in radio maintenance and morse.

In 1978 he was awarded the British Empire Medal for public service in the field of civil aviation. 1984 was Peters last posting to Adelaide Airport. He then retired to Perth in 1986 and became involved with the Trav Net through Arthur VK6ART who Peter had worked many times while travelling around the Eastern States.

When Arthur retired from the Net, Peter joined Roy VK6BO and for the last 18 years has helped run the Trav Net. During that time, Peter and I have enjoyed meeting and making friends with many of the Amateur Radio travellers who have ventured over to Perth.

I have received many messages of sympathy from amateurs around Australia and would like to take this opportunity to thank you all.

Jacqueline Harrison

VHF/UHF - an expanding world

David Smith VK3HZ – vk3hz@wia.org.au
Leigh Rainbird VK2KRR – vk2krr@wia.org.au

Weak Signal

David Smith - VK3HZ

Solar flare activity in mid August produced some auroral enhancement on the evening of 24 August.

Ian VK3AXH reports: "I first noticed Joe VK7JG mention aurora on the VK/ZL logger. I then worked him on both 6 m and 2 m at 5x5 SSB. From then on, there were many stations worked on 2 m including VK2KRR, VK5NY, VK3ZQB on SSB and on CW VK3UM and VK3AFW. From my place this activity lasted from around 8:15 to 11:30pm EST."

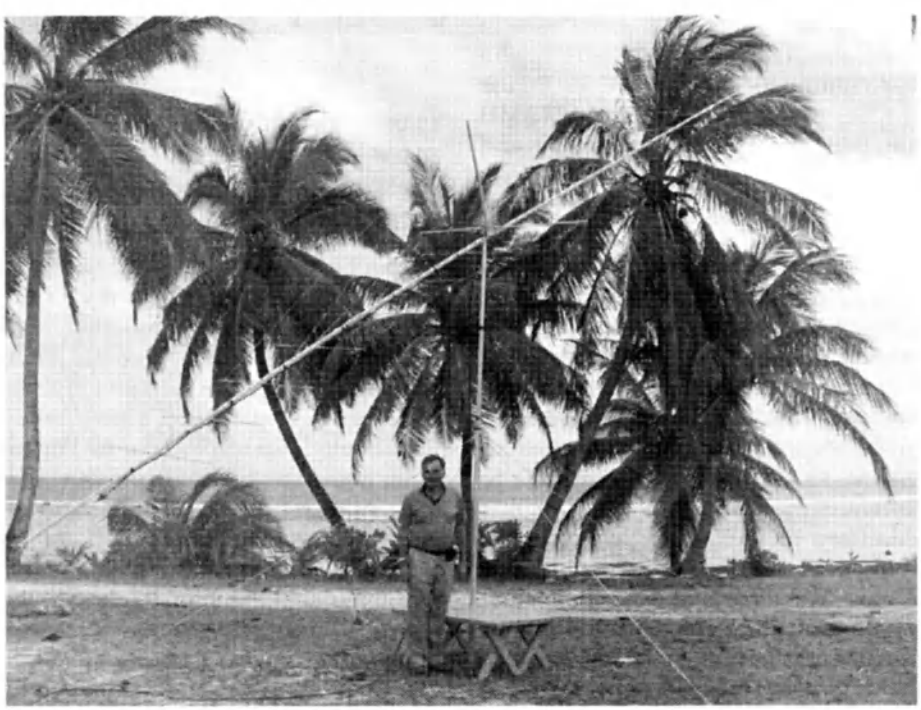
Ron VK3AFW reports: "I heard on the local AM radio that a listener in Ouyen could see the aurora. I went outside and could see cloudbank to the south and lots of scattered light, but no aurora visible here in the city. Checked the VK/ZL logger and saw a report of Ian VK3AXH having worked VK5NY with big signals via the aurora. Heard a strong signal from a VK5 - call not copied. Put on RIT set to -500 Hz and called CQ. Worked Colin, VK5DK, just before 1300 hrs UTC. Doug, VK3UM, worked Ian VK3AXH on CW. Some aurora effect on Doug's signal. I worked Ian on CW. Gavin VK3HY calling on CW, too close for any aurora effect."

Doug VK3UM reports: "I went outside at about 2230 EST and thought Moon was rising (in the south?) It was a spectacular Auroral visual display from the SE to SW and up to 60 degrees El. In almost 10 years at this QTH (with no lights) it was the first visually observed. Typical 'wedding cake' verticals ranging from blood red through pink white to green. Quite spectacular and bright enough to read a newspaper. Different to the bursts of 'light areas' that I have seen in northern SM. Unfortunately it did not last long and disappeared at about 2250 EST. Radio wise, quite disappointing. Massive noise bursts were recorded on 70 cm and 23 cm the previous day."

For those interested in portable operation and aircraft enhancement, Barry VK3BJM has created a web site detailing his exploits in these areas over the years. Steer your browser to www.users.bigpond.com/vk3bjm/

EME

From mid August until late September, Rex VK7MO was operational on EME from the islands off the west coast of Australia. Operation was restricted to only digital mode using WSJT JT65 and only a single long yagi was used. Initially, Rex was operating as VK9CMO from the Cocos Keeling Islands where he managed 67 contacts on 2 m and 3 contacts on 70 cm. In early September, Rex moved to Christmas Island under the callsign VK9XMO. As this report is being written, he now has over 100 contacts and still over a week of operating to go. Expect a full report on the trip once Rex returns. In the meantime, some photos of his setup are included here. Note his Az/El control system – a string from the rear of the yagi wound around a section of palm frond held down by a lump of coral. For El control, wind the string on or off the palm frond, and for Az control, move the frond and coral!



Spring VHF-UHF Field Day 2005

A note from John Martin VK3KWA, contest manager, advises that the dates for the Spring VHF-UHF Field Day are Saturday and Sunday November 12 and 13. Duration in all call areas other than VK6: 0100 UTC Saturday to 0100 UTC Sunday. Duration in VK6 only: 0400 UTC Saturday to 0400 UTC Sunday. For further details, contact John.

Beacons

A recent VK2 broadcast carried the news that the VK2RSY 70 cm beacon has failed and is now QRT permanently. A new beacon is under consideration.

Colin VK5DK reports that work has been carried out on the VK5RSE beacons on 70 cm and 23 cm. Hopefully there is a big improvement in stability and keying note. Colin welcomes any reports to him at vk5dk@internode.on.net

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital DX Modes

Rex Moncur – VK7MO

Joe Taylor W1JT has announced a beta release of WSJT version 5.8.1. This is a major revision of WSJT, with many new features, rebuilt almost from the ground up.

New capabilities include:

- Built-in real-time waterfall display, usable in all WSJT modes
- DF of signal selectable directly from the waterfall display
- Selectable sound card
- Improved control of T/R timing
- Immediate decoding available after meteor "pings" in FSK441 mode or signal enhancements in JT6M mode
- No need to re-enter station parameters after a version upgrade
- 16-bit audio for better dynamic range
- Transmitted as well as received information saved
- Optional logging of QSOs (for contests, etc.) in file WSJT.LOG
- Continuously updated solar and lunar coordinates and Doppler information provided in a file usable by other programs

Many other program enhancements are still to come:

- Correction for inaccurate sound-card sample rates
- Improvements to decoders for all WSJT modes
- Non-saturating measurements of signal level in JT65 mode
- Open source policy for nearly all program code
- Relatively easy to port program to Linux or Macintosh

Version 5.8.1 is stable and very usable. A few familiar features present in version 4.x have not yet been implemented (for example, CWID and EME Echo mode). With many thousand lines of new code, it is likely that there are some new bugs.

Go to the WSJT Home page, http://pulsar.princeton.edu/~joe/K1JT/, to download the new program.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

The Magic Band – 6 m DX

Brian Cleland – VK5UBC

August has been a very quiet month on 6 m. There have been very few reports of band openings from anywhere in Australia. Only Norm VK3DUT who has continued to get openings across the Tasman working Murray ZL3MH and Mike ZL3MF on 14 August and John ZL3AAU, Duncan ZL3JT & Keith ZL3RW on 15 August. Good work Norm. Norm also heard the VK7RST/b on AU on morning of 25 August.

SWL Dave from Adelaide reports hearing the Hunter Valley VK2RHV/b on 50.288 from 0756-0807z on August 11 and the Alice Springs VK8RAS/b on 50.046 from 0717-0744z on August 25.

The only other news of interest is from Wayne VK4WS who has been able to hear W1JJ via moon bounce and reports that Gary VK4ABW in Townsville has worked several stations via the Moon in August. Wayne says he can hear Gary on a half-wave vertical via Meteor Scatter when Gary's beaming at the Moon.

I've received requests for information of where to listen to assist newcomers to 6 m. Below is a list of Australian 6 m beacons that are presently operational.

50.046	VK8RAS	Alice Springs	CW
50.058	VK4RGG	Gold Coast	CW
50.066	VK6RPH	Perth	CW
50.087	VK4RTL	Townsville	CW
50.288	VK2RHV	Hunter Valley	CW
50.289	VK2RSY	Sydney	CW
50.293	VK3RMV	Wannon	CW
50.297	VK7RST	Hobart	FSK
50.306	VK6RBU	Bunbury	CW
50.345	VK4ABP	Longreach	CW
52.450	VK5VF	Adelaide	CW

There are other beacons either planned or not operating at present and I will advise of any updates. It is also useful to listen for Channel 0 TV, in particular, Toowoomba sound on 51.672 and Wagga sound on 51.740. The international call frequency is 50.110 with most SSB operation taking place between 50.110 and 50.200. For more information check the Australian Amateur Callbook.

10 m activity is starting to improve so hopefully 6m will start coming to life during September.

Please remember to send any 6m information to Brian VK5UBC at bcleland@picknowl.com.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

While conditions were quiet during the first half of August, a few surprises were thrown in by mother nature for the latter part of the month for southern Australian operators. With 6 days of good conditions in a row, thanks to a slow and stable high pressure system with a good centre pressure, many now have their fingers crossed that it was a sign of what may be coming for us this summer! While it may have only been a freak of nature, we can still hope.

First up for the month was some activity for northern VK4 operators when in the evening of 15/08 the tropo picked up as reported here by Mike VK4MIK at Butchers Creek. "I went on air at 7.53 pm to contact Dennis VK4JDJ at Herberton and Gary VK4ABW at Blue Water, north of Townsville, both with good signal reports on 146.500 simplex. Russell VK4BEG at Lake Eacham then joined in, I also called in Ross VK4AQ, Innisfail. Felix VK4FUQ at Ingham was also readable off the back of his beam. John VK4FNQ at Charters Towers (305 km) also came in, as did Bill VK4WL at Mareeba who could not hear the others. It was passed around to get as many contacts with Gary as possible and later John. Ross had trouble hearing other stations but made contact with Gary, as did Dennis, Russell and myself. Signal strengths from Gary were at S6 - S9+. The maximum distance worked was between John VK4FNQ and Russell VK4BEG at 311 km".

Heading down south, from Monday evening 22/08 tropo picked up. Conditions built up each evening thereafter and peaked around Friday and Saturday evenings.

On Monday evening 22/08, after 10.30 pm, I was very happy to have made it to the legendary VK5RMB Murray Bridge repeater again (733 km) after such a long wait after the repeater was damaged by a lightning strike. Being a little worried about how the repeater would perform after the repairs, I soon had no fear about its ability when I realised this was the only repeater in VK5 that I was able to access. Amazing. Later on I was also able to access Crafers at 764 km, Barossa Valley at 741 km and Lobethal at 747 km, signals, mostly weak.

On 23/08 signals were again present from some VK5 repeaters, similar to the conditions from the previous evening. On 24/08 again same repeaters just in from VK5, but this time a contact on 146.500 with Gary VK3KYF from Mildura was available at 466 km, Gary was 5/7. Damien VK3HGY at Mirboo Nth made it to the Mt Gambier VK5RMG repeater at 474 km. While Damien could not raise any VK5's for a contact he did manage to raise Max VK7KY from the Tasmanian north coast.

A similar report again for the 25/08, but there was one BIG exception. At around 4 pm, Michael VK3KVW at Ballarat reports working John VK6ZN stationary mobile near Eucla in Western Australia via the 146.900 repeater at Mt Gambier, which is 1282 km for John across the Bight. The two then also made the contact on 146.500 simplex over the 1515 km path. Well done.

On 26/08 a Friday night special saw some pretty big signals floating about which was great. At 6 pm the Geelong repeater was 5/9+50 at 383 km, Otway Ranges was also 5/9+50 at 486 km. After 8 pm, VK5 signals started coming in again, the Renmark TV beacon on 143.760 FM was over 5/9+60 at 600 km.

After 9 pm signals started coming in from Broken Hill. Close to 10 pm the Broken Hill repeater on 147.000 was 5/7 signal at 638 km. I was able to catch up with Paul VK2YVG and Brian VK2DPG both from Broken Hill on their repeater. While I could not hear Paul on simplex, Brian was throwing in a good signal on 146.500 up to 5/7. The repeater peaked at 5/9+20.

The last good day was Saturday 27/08. Another big surprise was contacts made by Hayden VK7HAY portable at Mt Blackwood in northern VK7. At 2.26 pm and with a simple set up, Hayden was able to work the VK2RFS Mt Mumbulla repeater on 146.750 at a big 641 km, Hayden spoke to David VK2DE. Hayden also worked to the Bairnsdale repeater at 470 km, where he spoke to Ben VK3CBE and also to Mt Baw Baw at 445 km. Well done Hayden.

After 6 pm, I had repeater signals such as the following: Ararat 5/9+60 @ 410 km, Grampians 5/9+40 @ 471 km, Mt Macedon 5/9+60 @ 324 km, Mildura 5/9+20 @ 466 km. Able to access these (except Mildura) with only 2 watts from the rig. At 9.50 pm was able to work Les VK3TJ at Mildura on simplex, 5/5 at 466 km.

As a nice finishing touch, at 11 pm the Warrnambool 147.050 repeater was coming in at 5/9+20dB at 512 km, where I was able to work Michael VK3KVW and Ian VK3IDL from Ballarat and also Russell VK3ZQB at Port Fairy. Michael VK3KVW was also worked on 146.500 with a nice 5/9+40 signal. Russell and Ian were heard on reverse.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au

ar

Silent key

Louis Arthur Jantke VK5LE

Louis was born on 29th June 1921 at Swan Reach, SA and lived on the same farm all his life.

In 1946 Louis married Joyce Grieger, their marriage was blessed with three children, Janice, Beverly and Steven.

Lou was a quiet achiever. He was a farmer as well as the local electrician. His interest in electronics began early, making his first crystal set at 14 years of age. He repaired many a wireless set and TV for people in the Galga district and beyond. It was always his own TV that had the snowy picture!

A keen amateur, Lou talked to people worldwide, delighting in using the Morse key. He was a life member of the Riverland Radio Club. He was the Secretary of the local Lutheran Church and Elder for a number of years.

Shooting was another passion, Lou won a number of trophies with the Barmera Clay Target Shooters Club.

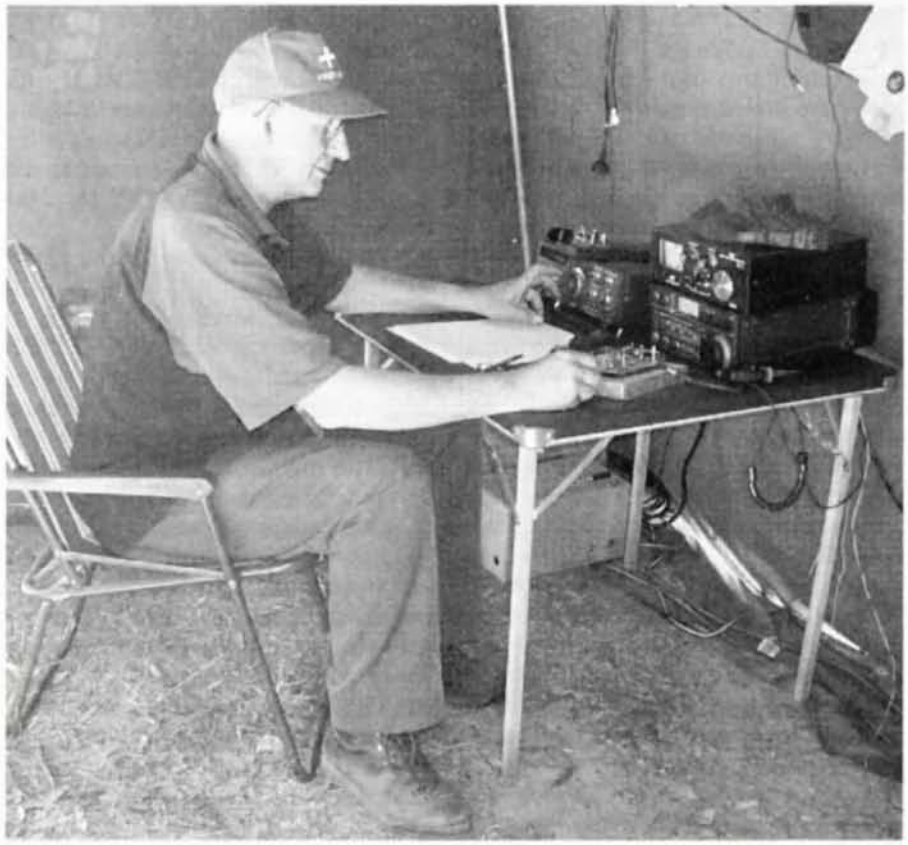
Gradual loss of eyesight began robbing Lou of keeping active in all the things he loved to do. He also experienced deteriorating health over the past nine months, passing away on 19th March 2005.

He is survived by his wife Joyce, 3 children and his only sister Lorna.

Submitted by Adrian Reimann VK5AJR

RD Contest

Alan Mason VK2GR



Allan, VK2GR, the Hills District Scout Leader, operated portable in the CW section of the RD 2005 Contest from Cataract Scout Park, near Appan.

The RD radio operation was scheduled between the first aid duty support at the annual NSW Scout Rally. During the rally, patrols of 4-8 scouts hike between the activity camps and participate in scored activities over the weekend. The male and female youth members are aged between 11 and 15 years. The scout patrols are self sufficient for the weekend except for water and the supervised cooking fires.

Allan and his wife Josette, also members of St John Ambulance, have been providing the first aid and medical support at all the major scout events in NSW for the past 10 years. The old workhorse radios used during the weekend were a TS120S and an IC720A, with the antennas being, a G5RV inverted vee and a 40 m helical mobile whip.

The G5RV loaded up surprisingly well on 160 m with VK2, VK3 and VK4 contacts logged."

RD at VK2WIA in the Hunter Valley

John VK2BBC operating and Steve Wright log keeping in the early morning before the cold set in.

Several amateurs from Sydney and the Newcastle area decided to get together and man a Remembrance Day contest station using the callsign VK2WIA. Jamie, VK2YCJ offered the use of the Luskintyre Tigermoth airstrip clubhouse facilities and it was also decided to extend an invitation to all interested radio amateurs, their families and friends to visit over the weekend. As well as radio and socialising activities, tours of the museum and workshops were run throughout both days.

A total of 25 people stayed the night at the bunkhouse, in caravans and tents. Those present partied on in to the small hours of Sunday morning. The total number of visitors throughout the weekend was around 70 and the station made a total of 460 contacts. Copious quantities of food and beverages were consumed and the BBQ dinner and breakfast was very popular with all attending. Epicurus would have been pleased to attend the weekend.

Most of those attending indicated they would be back next year for a much bigger and better weekend.

ar

VK5 Exam assessor training course held in Adelaide

Trevor Quick VK5ATQ

The first WIA Exam Assessors course was held in Adelaide on 27/28th August 2005. The picture show those who attended. The guide dog Neon is a useful addition to the assessors' ranks!

The course went very well and those who attended had great praise for the presenters Fred and Lorraine Swainston.

***Above**: Left to right standing*: Alan Richardson VK5ARG and Neon the guide dog, Peter Watts VK5ZFW, Sasi Nayar VK5SN, Jim Tregellas VK5JST, Mike Turner VK5AMT, Gerard Rankin VK5ZQV, Keith Gooley VK5OQ, Jeff Farmer VK8GF, Andrew Williss VK5LA, Dean Whitehorn VK5ZDW, John Drew VK5DJ, Trevor Niven VK5NC, Fred Swainston VK3DAC,
Kneeling next to Neon, Mervyn Millar VK5MX, Ian Northeast VK5XE, Paul Hoffmann VK5PH, Barry Bates VK5KBJ, Noel Ferguson VK3FGN, (Chris Platt VK5JJJ and Peter Cockburn VK5TZX absent from photo)
Left: Neon, the guide dog

Beyond our shores

David A. Pilley VK2AYD
vk2ayd@wia.org.au

Everything seems to be happening in Italy this past month!.

If you have news from overseas, please email me and mark the subject BOS.

Italy

joins the no-code chorus

Another nation has joined the code free ranks. The word from Italy is that it is no longer a requirement for applicants for a ham radio licence to sit for a Morse qualification exam. According to listener Vinceinzo Ferrea, Italian telecommunications regulators announced the decision to abandon the code qualification on August 9th.

The Daily DX http://www.dailydx.com reported that current IW-prefix "no-code" VHF/UHF licensees in Italy will now be allowed operate on HF.

(ARRL News)

Italy

Rescue Radio: Red Cross says "yes" to ham radio

The Italian Red Cross will activate its first ever amateur radio station in October under the call-sign IZ4GQA. The pioneering new station is the brainchild of the radio communications department of the Italian Red Cross's Emilia Romagna region.

The department had been looking for a communication tool to provide wider coverage than existing radio networks, incur no fees and be capable of working in crisis and emergency situations.

An amateur radio station appeared to be the perfect solution, but at the time the Italian Red Cross had never before been authorised to operate such a station. Not to be put off, members of the radio communications department obtained a copy of the official Italian amateur radio regulations and submitted a seven-page application for a licence to the Italian ministry of communications.

The application was successful and the Italian Red Cross was given the green light to operate an amateur radio station. An Italian Red Cross spokesman said: "Now we can communicate on all ham bands, being able to connect Red Cross stations not only in our region, not only in Italy, but all over the world."

(ARNewsline)

UK

Restructuring commentary period ends

The time for UK hams to submit comments on their governments latest restructuring proposal ended on the 18th August. It was one of the longest and most comprehensive consultative periods in the history of Great Britain's Amateur Radio service. In this case the word consultative means the same as public commentary.

From the outset of the consultation, as the national organisation representing all UK radio amateurs, the RSGB's intention was to ensure the maximum numbers of radio amateurs had their say in the future licensing debate that included some 15 national meetings across the nation.

Generally the feedback from the UK ham community shows that most amateurs are comfortable with the concept of an 'electronic' licence. If this was introduced they would wish to see adequate security measures built in to ensure that fraudulent applications could not be made and that the integrity of the licence is maintained.

While the majority of radio amateurs are not in favor of a 'lifetime' licence, there is much concern about the degradation of the amateur radio database and they believe that an out-of-date listing would lead to an increase in call sign piracy and more interference on the bands.

(GB2RS)

USA

10 codes R I P

Now on the lighter side

The US Federal Emergency Management Agency says that 10 codes are out.

'10 codes' are the numbers based shorthand that have been used by emergency communicators for well over four decades. The same ones adopted by 11 metre operators in the late 1960s and still used on CB to this very day. Numbered words like 10-20 for location and 10-7 for 'I am out of service'.

The agency is requiring all agencies to stop using 10 codes and instead to speak or write in clear text. And while the National Emergency Management System Integration Center says that no entity will loose funding if the mandate is not strictly adhered to, it could change this position later on.

The N.E.M.S directive only affects professional emergency communicators. Radio hobbyists are not even mentioned. So it looks as if the only ones left using 10 codes in the future will be the "good buddies" on 11 metres. And that big 10-4 will change to "Copy that!" (What happened to 'Roger' and 'Wilco'?)

(ARNewsline)

ar

Meet Judith Oliver, WIA National Office Co-ordinator

Judith Oliver comes to the WIA with diverse skills gained from a broad career background.

She has held various management positions honing her public relations, fundraising and administrative skills across the health, aged care, community development, and youth markets in the not-for-profit, government and community sectors. She is also a qualified and experienced secondary and tertiary teacher and recently worked for an educational publisher.

Judith is enjoying the challenge of increasing her 'hands-on' administrative skills, a necessity in such a small office (where she and Emma have to wear so many different hats). Although she does not have any amateur radio experience herself, her great-uncle – Mark Oliver – was very involved in NSW in the beginning of the 20 th century (though sadly she did not get to know him).

Judith says that her biggest challenge will be to thoroughly understand and learn the 'new language and customs' of the WIA and amateur radio, and she thanks June and Emma especially for all their assistance and support in her new role managing the WIA national office.

ar

Peter GibsonVK3AZL

Heavy duty standoff insulators for ladder line

In the 'Hints and Kinks' section of July 2005 QST, Charles Simon, N0MS, describes an interesting method for supporting heavy duty 450 ohm ladder line.

As 450 ohm ladder line offers a broad surface to windy weather conditions, strong tie points are required to resist wind buffeting and eventual breakage. The following designs meet those requirements. Figure 1 shows four different styles, for attaching the base of the insulator to the insulator to a wall or pipe. The other end of the insulator is made to secure the ladder line.

Figure 2 shows how the ladder line is secured with a cable tie.

The fabrication of the one inch PVC tube is performed with common hand tools. Following is the step by step procedure.

1. Lay out the 3.5 by 3.5 inch card stock template (shown in Figure 3) for accurate hole locations. Then punch a small hole at each hole location shown.
2. Wrap the template around the cut length of tubing at the end and mark hole locations with a black marker or pencil.
3. Centre punch each hole location and drill 7/32 inch diameter holes at locations A and B. Drill these holes through both sides of the tube.
4. Saw a 1/16 inch wide kerf around the long path from hole X to hole Y as shown in the photos and Figure 3. To get the saw kerf this wide, mount two 18 teeth per inch hacksaw blades in a hacksaw frame, together. Use a couple of wraps of electrical tape near the mounting holes to keep the blades together.
5. Deburr the holes and saw kerfs, both inside and outside of the tube, then check the clamping action with a piece of ladder line. This completes the fabrication of the insulator end that holds the ladder line.

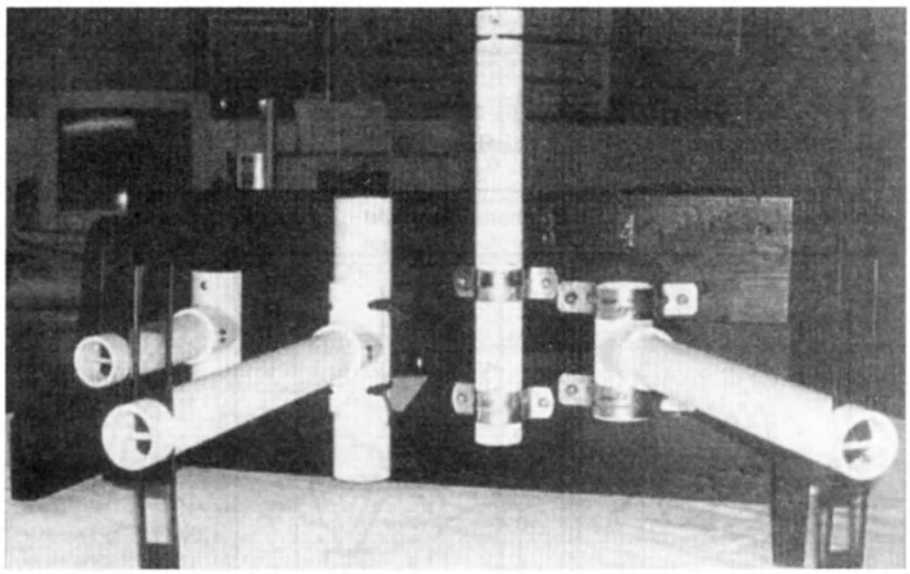


Figure 1. Four styles of PVC ladder line standoff insulators. From left to right are styles 1 through 4. Styles 1 and 2 both have the top half of the T caps removed. Style 1 is secured by long screws through the remaining cap to a wall. Style 2 is secured has tie wraps through holes in the remaining T cap securing it to a pipe. Style 3 has no T, but its tube is secured to a surface with pipe straps. In style 4, the T is secured to a wall with pipe straps.

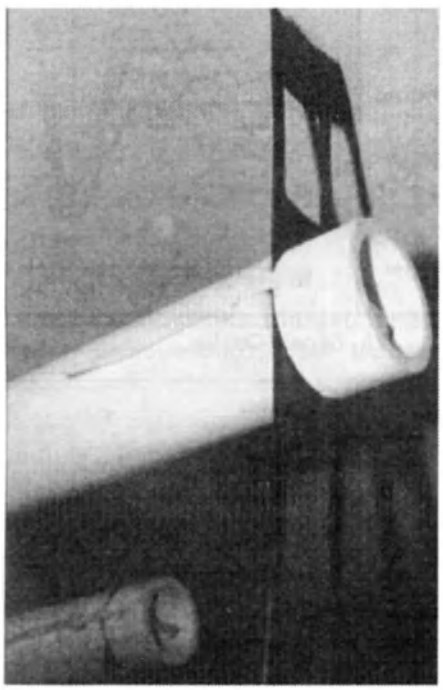


Figure 2. A cable tie clamps a kerf in the tube on the ladder line, securing it in the standoff.

For styles 1 and 2, some of the cap of the T must be removed so that the remaining cap walls will present a stable, flat, surface for mounting (see Figure 1). Also drill 7/32 inch holes as needed for mounting.

Styles 1, 2 and 4 have the tube secured to T section. After the tube is in the correct position in the T, drill a suitable sized hole through the T and tube and install a self tapping screw to stop rotation.

ar

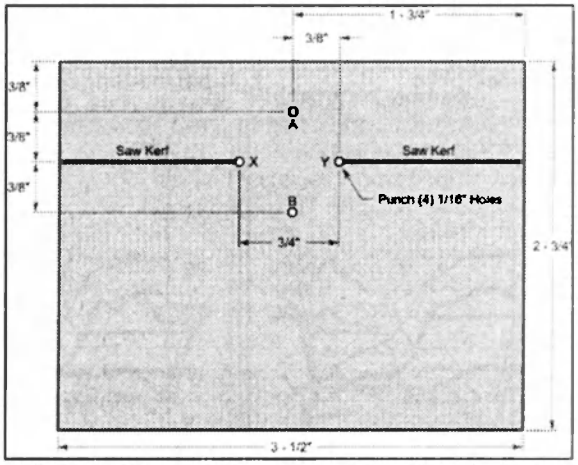


Figure 3. The template for marking the tube ends should look like this (not to scale).

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

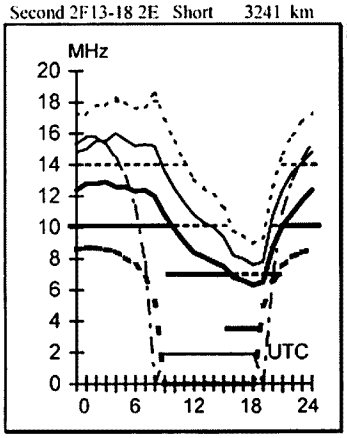
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

October 2005
T index: 22

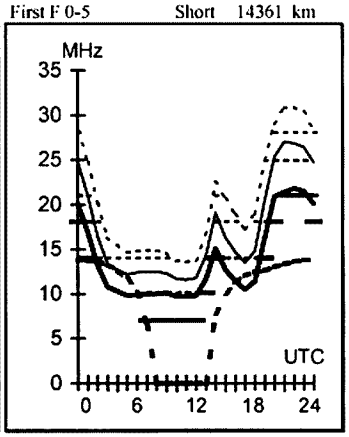
Legend

Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

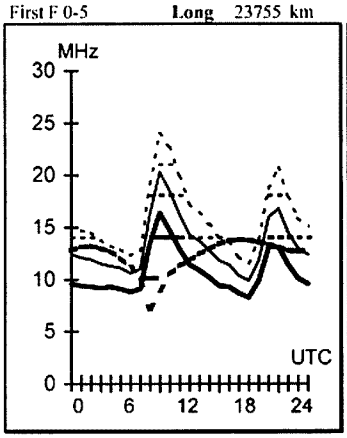
Adelaide-Auckland 104
Second 2F13-18 2E Short 3241 km



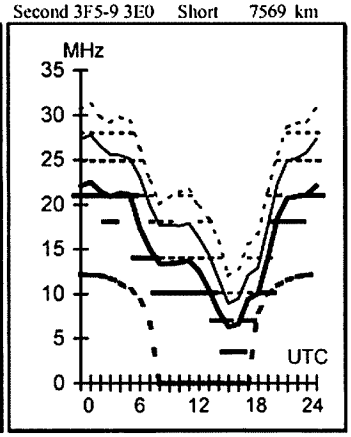
Brisbane-Chicago 57
First F 0-5 Short 14361 km



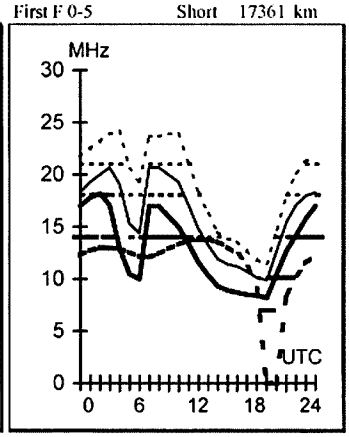
Adelaide-London 132
First F 0-5 Long 23755 km



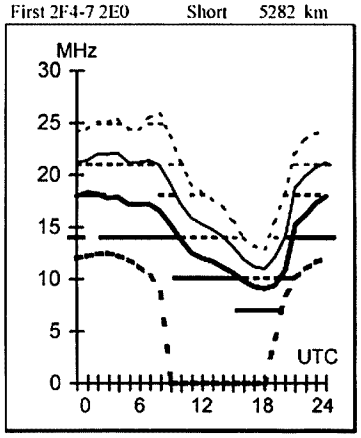
Brisbane-Honolulu 49
Second 3F5-9 3E0 Short 7569 km



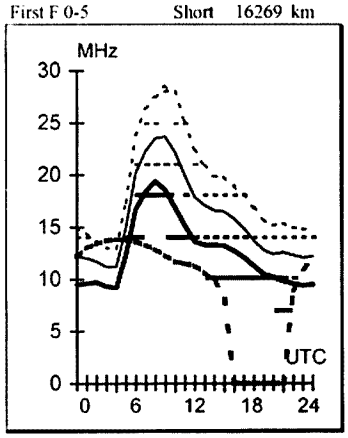
Canberra-Dakar 214
First F 0-5 Short 17361 km



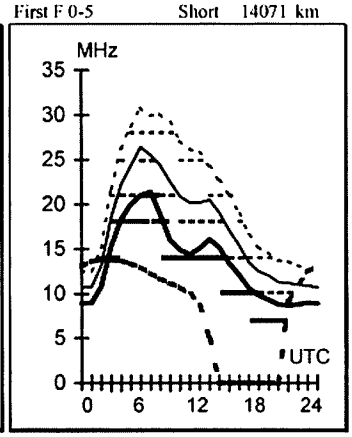
Darwin-Christchurch 139
First 2F4-7 2E0 Short 5282 km



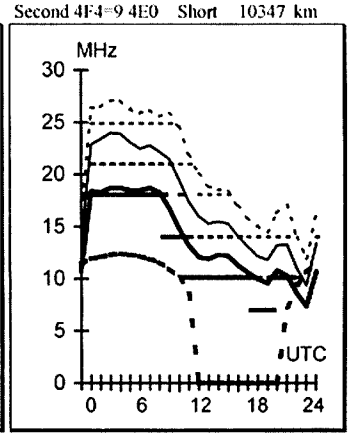
Adelaide-London 312
First F 0-5 Short 16269 km



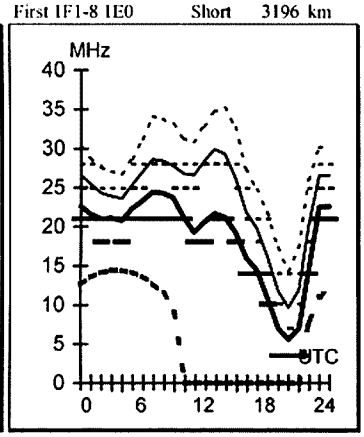
Brisbane-Moscow 321
First F 0-5 Short 14071 km



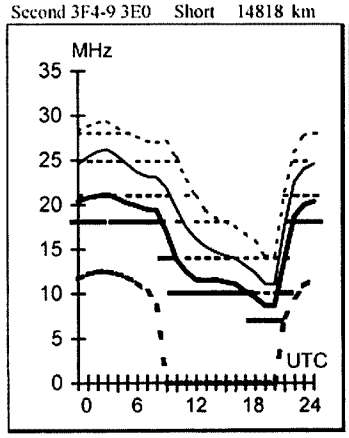
Canberra-New Delhi 303
Second 4F4-9 4E0 Short 10347 km



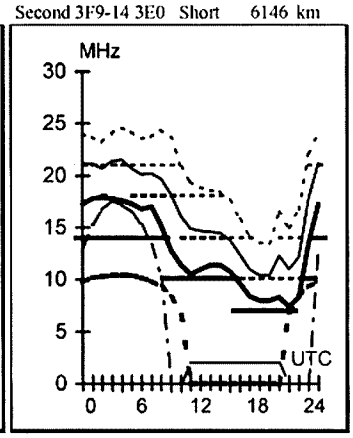
Darwin-Manila 340
First 1F1-8 1E0 Short 3196 km



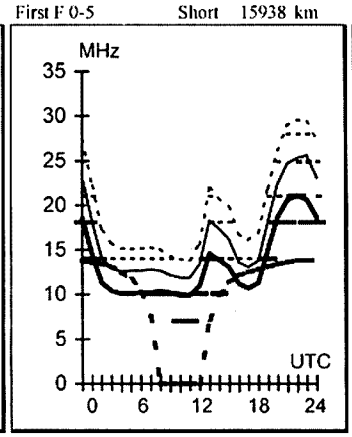
Adelaide-Tokyo 1
Second 3F4-9 3E0 Short 14818 km



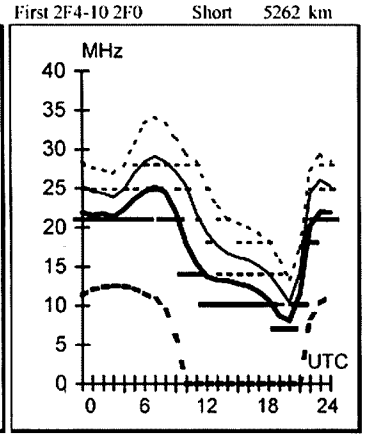
Brisbane-Singapore 293
Second 3F9-14 3E0 Short 6146 km



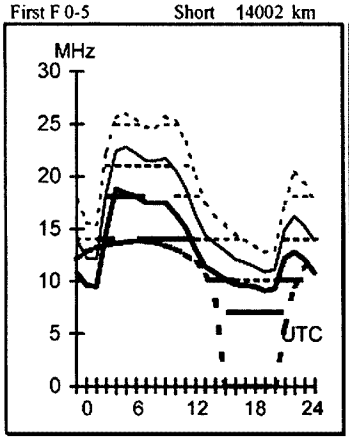
Canberra-Washington 70
First F 0-5 Short 15938 km



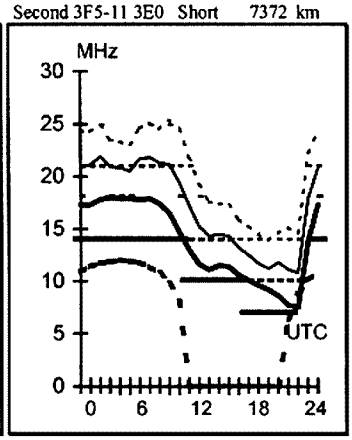
Darwin-Osaka 5
First 2F4-10 2F0 Short 5262 km



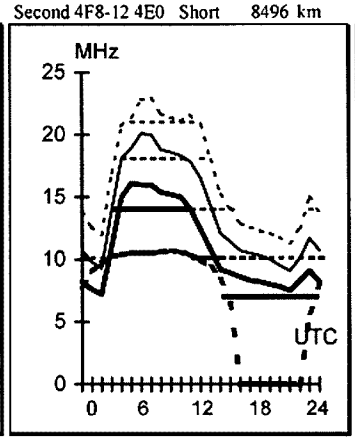
Hobart-Amman 283
First F 0-5 Short 14002 km



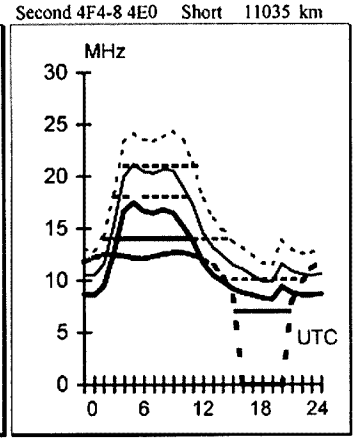
Melbourne-Bangkok 312
Second 3F5-11 3E0 Short 7372 km



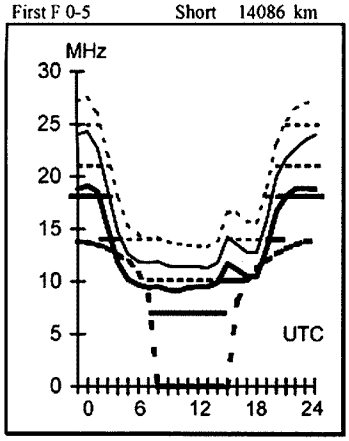
Perth-Harare 257
Second 4F8-12 4E0 Short 8496 km



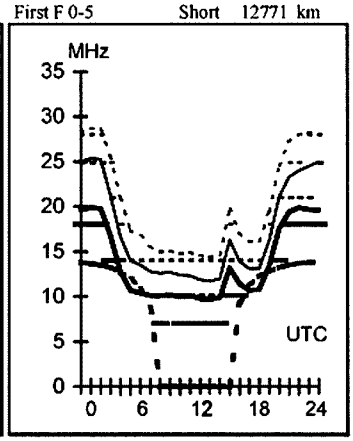
Sydney-Johannesburg 230
Second 4F4-8 4E0 Short 11035 km



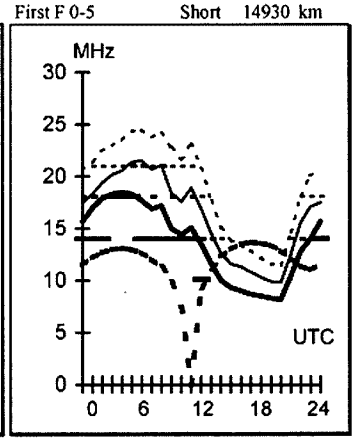
Hobart-Cagary 51
First F 0-5 Short 14086 km



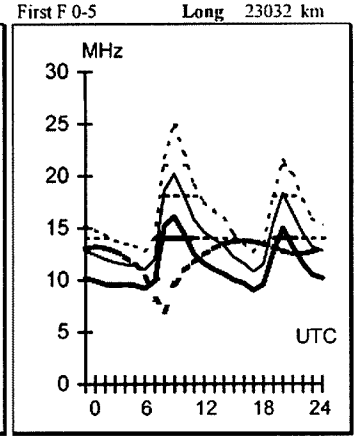
Melbourne-Los Angeles 65
First F 0-5 Short 12771 km



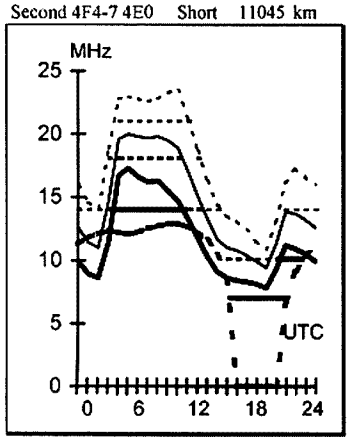
Perth-Lima 162
First F 0-5 Short 14930 km



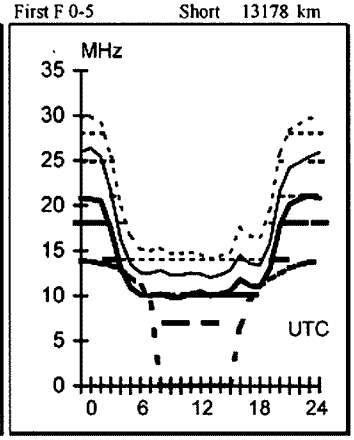
Sydney-London 139
First F 0-5 Long 23032 km



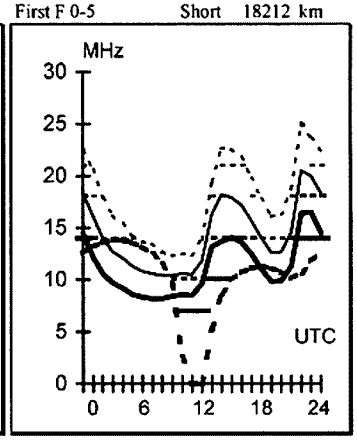
Hobart-Lusaka 239
Second 4F4-7 4E0 Short 11045 km



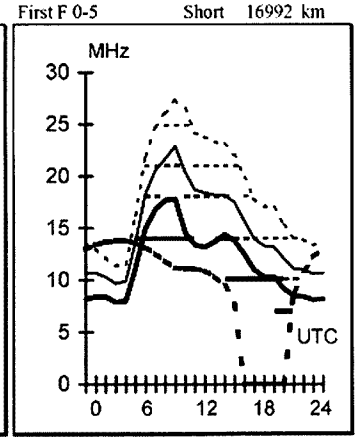
Melbourne-Seattle 50
First F 0-5 Short 13178 km



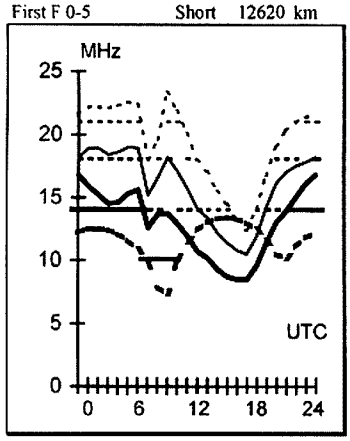
Perth-Ottawa 30
First F 0-5 Short 18212 km



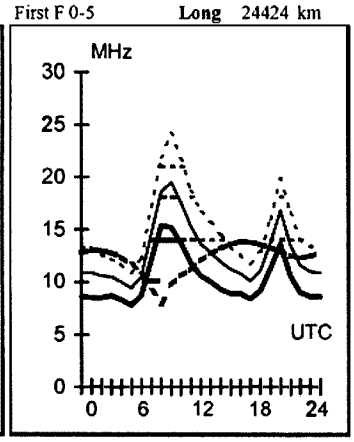
Sydney-London 319
First F 0-5 Short 16992 km



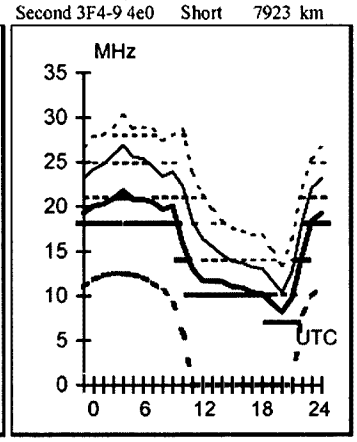
Hobart-Rio de Janeiro 169
First F 0-5 Short 12620 km



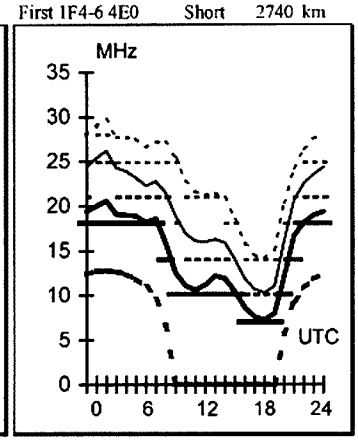
Melbourne-Stockholm 140
First F 0-5 Long 24424 km



Perth-Tokyo 20
Second 3F4-9 4e0 Short 7923 km



Sydney-Port Moresby 351
First 1F4-6 4E0 Short 2740 km



Hamads *classifieds* FREE

FOR SALE-NSW

• **Kiron Sat Trak 4** an azimuth/elevation rotator interface. Works directly with Yaesu rotators. An interface kit is included for work with other rotators. Tom, VK2OE@arrl.net 2/25 Andrew St Inverell NSW 2360 Phone 0413 796 851 evenings.

WANTED NSW

• **Realistic HTX-100 10m transceiver** in good condition. Leigh Rainbird VK2KRR, Phone 02 69202212, 0419631199, vk2krr@bigpond.com

FOR SALE VIC

• **6 m Yagi Antenna ATN model 50-52.5**, 5 el 11.9 dBi gain, 3.5 m boom c/w feed balun. Classic ATN design, solid boom etc. Taken out of service about a year ago after many years faithful performance. Alas, due to renovations and build-out I no longer have a usable outlook for the "magic band". Element mounting bolts all renewed. Breaks down to about 1.8 m length for shipping by road. $90 Terry VK3ZXY QTHR Phone 03 9592 3514 email vh3zxy@leithy.com.

• Deceased Estate. **AOR AR7030 0-32 MHz** all modes S/n: 101410 fitted extra HQ Murata 1 kHz, 4 kHz, total 6 filters, manual, new battery, PC data cable $1,239 ($2,105). **AOR AR8200** mk2 wide range receiver S/n: 078011 $649 ($1,090). **RF Systems DX-Oneant** $649 ($1,150) all EC. **HF Dipole ant.** 7-21 MHz 2 kw $155, **Kenwood Ant. Tuner AT-230** $55 all GC. Call Mark on 03 9755 7295 Mobile: 0412 821 694 email: e-service@tpg.com.au.

WANTED QLD

• **Operators/service handbooks** (or copy) for **HP AF generator model 200CD** and **Marconi power meter model 893A**. Will refund all costs. Gwen VK4CB QTHR Phone 07 3202 7137

• **Circuit diagram of a Magnum by Palomar solid state HF amp.** Believed to be made for CB but not sure. Any information would be appreciated and all expenses paid. Merv VK4DV QTHR Phone 07 4928 5537 (nights).

FOR SALE WA

• **FT-1000D**, S/N OJ 090225, with 250, 500 and 2kHz xtal filters and handbook. VK6HD@iinet.net.au

WANTED TAS

• **BC-221 frequency meter for parts.** Prefer unit with dial mechanism in good condition. Trevor VK7TB Phone 03 6398 2118, email cabriggs@optusnet.com.au

MISCELLANEOUS

• **Wanted to assist documenting the history of AWA Teleradios.** Pictures, manuals, catalogues, articles, any information on these sets. Will pay for copying, etc. Contact Malcolm Haskard VK5BA, Phone/fax 08 8280 7192, email mhaskard@chariot.net.au

About hamads....

- Hamads may be submitted by **email (preferred)** or on the **form on the reverse of your current Amateur Radio address flysheet**. Please print carefully and clearly, use upper **AND** lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are prepayable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: ***newunltd@bigpond.net.au***

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793.* **Fax:** *03 9756 7031*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

ADVERTISERS INDEX

AEI 14
Andrews 29
Benelec ..... IFC
Clarke 40
Com-an-tena 8
TET-Emtron 9
G & C 17
Icom ..... OBC
Ozgear 17
TTS 23
Small ads 55
VK Discounts 55
VK Books 35
Winlink 17
www.vk3ajj.com 55

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: ★ **$ 75 for full members (F grade),** ★ **$ 70 for pensioners and students (G and S grade), and** ★ **$ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reicheit VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reicheit@bigpond.com vk5atq@charlot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 436.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6QO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

New Awards

Mal Johnson VK6LC

The WIA Awards are proudly to release two final A3 sized DXCC Certificates that complete the total range

We are the first in the World to do this and further details will be written up soon.

The 9 Band DXCC "9BDXCC" and 11 Band DXCC "11 BDXCC" can be viewed also on the awards website.

These awards are available now for submissions and treated as "Specials", a small fee will be required.

See 'Awards' column on page 34

ICOM'S PRICE BREAK THROUGH

MOST AFFORDABLE PRICES EVER

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706

Now includes 70cm @ 20W and 50W on 2m Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-2200H

High (65W) Power Output • DTCS & CTCSS Tone Squelch • DTMF Encode & Decode (with optional UT108) • Digital Voice & Data Communication (with optional UT118 • 207 Alphanumeric Memories

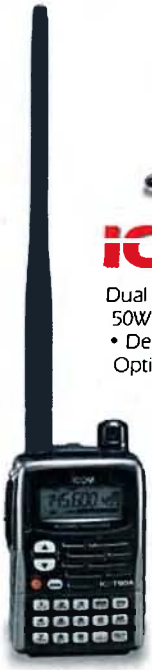
NEW

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch • Detachable Front Panel standard (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied: HM133.



IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495 KHz - 1 GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

ICOM

ICOM 48

Call you local ICOM dealer

www.icom.net.au or (03) 9549 7500

Volume 73 No 11
November 2005

Amateur Radio

$6.50
incl GST

WIRELESS INSTITUTE OF AUSTRALIA

The magazine for AUSTRALIAN radio amateurs

Testing treasures from VK3XU

Are you ready for action?

the expanding future of encoded transmissions

Bill Isdale VK4TWI

Experiments in aircraft enhanced propagation

Barry Miller VK3BJM

A Tetrode Tester

Drew Diamond VK3XU

9 770002 685116 11

BENELEC

YAESU

BENELEC 3 YEAR YAESU Australian WARRANTY

FT-857D

Now includes DSP2 unit built-in

- Ultra Compact + All Mode Transceiver
- 160-10m / 6m / 2m / 70cm
- 100W, 100W, 50W, 20W

Price $ 1,424.00

Ideal Antenna:
ATAS 25 /ATAS120 / Comet UHV6

FT-897D

Now includes TCX0-9 Built-in

- Portable / Mobile / Base All Mode Txr
- 160-10m / 6m / 2m / 70cm
- 100W, 100W, 50W, 20W

Ideal Antenna:
ATAS 25 /ATAS120 / Comet UHV6

Price $ 1,600.00

FT-7800

2m / 70cm Dual Band FM Transceiver

- High Power Output
- Wide Receiver Coverage
- Five One-Touch "Hyper Memory"
- Over 1000 Memory Channels
- WiRES Internet linking Compatibility

Ideal Antenna:
Comet SBB5 / CHL 250H
SB15

Price $ 475.00

FT-8900

Quad Band FM Mobile

- 29 / 50 / 144 / 430 MHz Quad Bander
- V+U Full Duplex Operation
- High Power 50 W and Heavy Duty PDA
- 50 Tone CTCSS / 104-Code DCS Tone Systems
- Huge 800 Ch memory Capacity

Ideal Antenna:
Comet UHV4

Price $ 853.00

FT-817

Now includes FNB72 Internal Battery

- Ultra Compact 135 x 38 x 165mm
- All Mode Portable Transceiver
- 160 - 10m / 6m / 2m / 70cm
- 0.5-5 Watts Selectable

Price $ 1,167.10

Does Your Radio Need Fix?
- We FIX YAESU Radios!
www.benelec.com.au/yaesu/yaesu.htm

VX-2

Price $ 343.20

VX-6

Price $ 508.00

VX-170

Price $ 290.80

VX-7

Price $ 695.00

Benelec Approved Amateur Transceiver Dealers

All Price icludes GST

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosund.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
vk3my@bigpond.net.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

Ozhelp Services
Tel: 07 3273 7263
sales@ozgear.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8285 2400
brenton@posnav.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 11
November 2005

The Journal of the Wireless Institute of Australia
ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Are you ready for action? 5
Bill Isdale VK4TWI

Library amateur radio displays 8
Graeme Wilson VK6BSL

TECHNICAL

A Morse frequency meter 7
Phil Rice VK3BHR

Restoring an 18AVT multi-band vertical 10
Peter Stuart VK2BEU

Experiments in aircraft enhanced propagation 11
Barry Miller VK3BJM

A Tetrode Tester 13
Drew Diamond VK3XU

DATV down under (Part 1) 17
Richard L Carden VK4XRL

All HF bands in one antenna installation 22
Don Haberecht VK2RS

Instant gratification 24
Bill Isdale VK4TWI

Making shunts for ammeters 27
Drew Diamond VK3XU

My even further experiences with DSB QRP 49
Graeme Wilson VK6BSL

COLUMNS

ALARA 35
AMSAT 50
Awards 34
Beyond our shores 37
Contests 41
Directory 56
DX News & Views 39
Editorial comment 2
Hamads 54
HF predictions 52
News from... 30
VK2 30
VK3 33
VK5 31
VK6 31
VK7 32
Over to you 47
Silent keys 12, 34, 40
Spotlight on SWLing 38
VHF/UHF – an expanding world 45
WIA comment 3
WIA news 4

Our Cover this month

Drew Diamond VK3XU and Max Riley VK2ARZ at the QTH of Drew trying out the latest 3XU QRP portable transceiver yet to be described.We look forward to hearing more! Photo by Andrew Diamond

Contributions to Amateur Radio
Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues
Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies
When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer
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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
***Business hours:* 10am – 4pm weekdays**

National Office staff

Judith Oliver	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Volunteer

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
Assistant Treasurer	Bruce Bathols	VK3UV

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	Glenn Dunstan	VK4DU
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glenn Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

Foundation Licence

The Foundation Licence has arrived and the first ones issued. The revised licensing structure has been promulgated and we now have a three-tier structure: Foundation, Standard and Advanced. We can all talk to each other using the basic modulation modes on most bands, so when you get a call from a new entrant who will have a four letter call please welcome them and give them all the help you can. Most likely the first thing to do is reply to calls on repeaters. There are lots of stories about amateurs on holiday who have announced their presence on a repeater and not got any replies. While an old hand can accept this, a new licenSee will think they are doing something incorrect or worse feel they are not worth talking to and soon give up.

PLEASE MAKE SURE THE NEW LICENSEES ARE MADE WELCOME.

Articles in *Amateur Radio*

Amateur Radio magazine has been criticised in some recent letters to me as editor. Some of the criticism I accept as valid and we were in error or even a bit LAX in our vetting. However we do need to make some allowances for new authors and their possible lack of knowledge. We should not have let some of these errors through, as their publication diminishes the standing of AR and the WIA.

Now AR is written by members of the WIA and readers who buy it on the newsstands. I can only choose from what has been submitted when I assemble an issue of AR. My present choice is from about 30 articles. I need more material on both technical and general themes. An article on a piece of equipment you have built used or modified. An article about a club activity or your own Field Day experiences would be welcome. For the next few months we will have to republish our own old material or material from our sister overseas amateur society magazines. Please think about writing something for AR yourself or encourage someone to write about something they have, or have made or have done using amateur radio.

When I was learning basic science at school we progressed by steps. When you went on you were told "Earlier we told you this but that is the basic explanation and you need to go deeper". In October AR on page 5 we published Hayden Honeywood VK7HAY's article on a simple dipole. It was quick and simple and many of us have used this design as a temporary solution to an aerial problem or as a Field Day aerial. However if you now read on in this issue on page 24 you will learn that the simple aerial has some problems. Even if you use this new information you can still have problems because in a typical modern backyard no dipole aerial will have both sides in exactly the same environment. The house will couple to one side and the big gum tree to the other. However with a bit of careful trimming or maybe just a good aerial matcher you can get it to work acceptably.

Our explanations of things are limited by our previous learning both formal and experimental. They get us by but are not exact. Our technical editors try to ensure our published articles are correct to at least a TAFE College certificate standard without rewriting the whole article. This sometimes annoys the purists but then not all amateurs have the benefit of a Technical College or a University education in radio communications. So please continue to tell us when we make fundamental errors. When we do not go deep enough please write a letter to the editor making the more detailed explanations available to everyone.

That is all for this month

73 Colwyn VK5UE

WANTED URGENTLY

Articles for Amateur Radio

Technical, club activities, DXpeditions, Field Days, opinion, or whatever your experience is or has been in amateur radio

Address for submitting articles can be found on page 1

Michael Owen VK3KI

That Was the Week that Was!

On 19 October 2005 the new Australian amateur licence structure came into effect. It is briefly described in the WIA's release published the day before, after ACMA's Determination under the Radiocommunications Act was registered, so fixing the commencement time.

Part of that release which summarises the new licences is reproduced in the News column in this AR.

These changes are the most significant for very many years, and follow the removal of Morse code as a requirement for all amateurs licensed below 30 MHz by the ITU's World Radiocommunications Conference, Geneva, 2003. The 5 amateur licensing options were no longer necessary and could be replaced by two, with a new entry level licence.

The Foundation Licence is the new gateway to amateur radio.

The ACA in its "Outcomes of the Review of Amateur Service Regulation", May 2004 reported that over two-thirds of all submissions were in favour of the introduction of a foundation licensing option, similar to the foundation licence in the United Kingdom. The "Outcomes" paper also said that the most common reason given for the support was the need to make the amateur service more accessible to potential amateurs, who they believed found the existing novice theory examination too difficult.

The Foundation qualification places emphasis on the safe operation of radio equipment, and includes the assessment of a practical element involving the operation of transmitters and receivers and a multiple choice written paper covering safety, operational and regulatory matters.

To meet the requirement for a practical element the WIA has introduced a new system of assessment of competency for the qualifications for the new licences, relying on qualified, accredited and registered WIA Assessors, who can undertake the practical assessment and also mark the examination papers. Over 70 people have qualified, either by attending one of the training courses conducted in Adelaide, Brisbane, Melbourne or Sydney, or by existing qualifications and have been accredited and registered by the WIA as WIA Assessors.

The WIA Assessors have in almost every case been nominated by a WIA Affiliated Club, and will be assisted by other members of the club involved in the examination process, either as Invigilators or as Group Leaders. Indeed, in the short run, clubs currently without a WIA Assessor will be seeking the assistance of other WIA Assessors in their training courses.

In addition, the WIA will be publishing in November a 96 (or so) page full colour book, "Your Entry into Amateur Radio – The Foundation Licence Manual", setting out all a candidate needs to know to qualify for the Foundation Certificate of Proficiency.

The first Foundation Licence Training course was conducted by the Gold Coast Amateur Radio Society over the weekend of 15 and 16 October 2005, with 16 candidates assessed as competent, and with the first Foundation Licence issued on 21 October 2005, VK4FRST. The News column has more information about VK4FRST.

We are being asked by many people, how do I get a Foundation licence?

The answer is to contact your closest radio club, and see what they are doing.

But, we do need to say that it is very important that, before we encourage the WIA Assessors and their clubs to train and assess as many candidates as possible, we make sure that we have identified and addressed any potential problems that could cause.

As I write this, the first course was conducted just over a week ago.

We are still evaluating what we learnt from that course, both at the course and preparing the Foundation Assessment Packs and processing the results.

What we learnt has to be incorporated in changed forms and procedures, which means a second revision of the Assessment Instructions.

Then one thing that we did learn from the first course was how important it was to have the right material for the course, and we do not know precisely when "Your Entry into Amateur Radio – The Foundation Licence Manual" will be available.

We have also learnt that it is a mistake to ask a new assessor to try to do too much too soon.

We must avoid putting our new assessors in a position where they are asked to assess too many candidates too quickly so that they make mistakes. That is why at this stage we are restricting the number of Foundation Assessment Packs that a WIA Assessor can hold to not more than than10.

Whatever we do, we must balance the obvious pressure from many people enthusiastic to obtain the Foundation licence qualification against the need to ensure that the system retains full credibility

So, I urge every club to look very hard at how it is responding to the undoubted new interest in amateur radio and the demand for Foundation licence training and assessment.

Another thing is also obvious.

There are many clubs that would like to have, because of their size, more assessors and there are clubs that have not yet had any assessors qualified and would now like to have their own assessors.

Of course the WIA will conduct further assessor training courses. I don't know where and I don't know when. But it will be as centrally located as possible, and we will be asking the clubs to send their potential assessors for training and qualification.

But, to enable us to judge the need, we are asking every club wishing to nominate a candidate for qualification to complete and forward to the office an Application for Assessor Training form.

I think that the last week has been one of the most exciting and important weeks ever in amateur radio in Australia, at least for very many years.

I believe that the WIA has led the way to a new amateur radio.

My concern is that we build on what we have. In effect, we hasten slowly, recognising the damage we could do if we make mistakes, but seek above all else to establish and maintain the credibility of what we have created.

ar

WIA News

New amateur licences come into force

At the first moment of Wednesday 19 October 2005 the new Australian amateur licence structure came into force.

At that time, the Determination made by the Australian Communications and Media Authority amending the Amateur Licence Conditions Determination became the law.

What does it mean?

It means that as from that time the Foundation licence exists.

The first Foundation Licences were issued by the end of that week, to those who qualified at the trial Foundation training course conducted by the Gold Coast Amateur Radio Society on the weekend of 15 and 16 October.

The amateur Foundation licensee can only use a transmitter that has been manufactured commercially, can only use voice, on either SSB, AM or FM or morse using a manually operated morse key, and not more than 10 watts output power SSB or 3 watts output power AM, FM or CW.

The Foundation station can operate on the 80, 40, 15 and 10 metre bands as well as the 2 metre band and the band 430 to 450 MHz, subject to necessary bandwidth restrictions.

It means that the Standard licence now exists, and this licence includes the existing Novice, and Novice Limited licensees, who now can use any emission mode with a necessary bandwidth not exceeding 8 kHz on the 80, 40, 20 and 15 metre bands, and any emission mode with a necessary bandwidth not exceeding 16 kHz on the 10 metre band, the band 52 to 54 MHz, the 2 metre band, and the bands 430 to 450 MHz, 1240 to 1300 MHz, 2,400 to 2,450 MHz and 5.650 to 5.850 GHz, with no change to the current output power limits of 100 watts and 30 watts.

It means that the Advanced licence exists, and this licence includes the existing Unrestricted licence, the Limited licence and the Intermediate licence. These licensees can use any emission mode with a necessary bandwidth not exceeding 8 kHz on all bands below 24.990 MHz, any emission mode with a necessary bandwidth not exceeding 16 kHz on the 28.00 MHz to 29.70 MHz band, any emission mode with a necessary bandwidth not exceeding 100 kHz on the 6 and 2 metre bands and any emission mode with no bandwidth restriction above 420 MHz, and with no change to the current output power limits of 400 watts and 120 watts.

Full details of the Determination and other administrative details including the arrangements being made by ACMA to substitute new licences for existing licenses can be found at the ACMA website, www.acma.gov.au, then Consumer, Radio Operators, About amateur radio ? and all amateurs are urged to check that site for the full and authoritative information.

First WIA 5 Band DXCC and First WIA 9 Band DXCC Awarded

On 21 October 2005, at the Moorabbin and District Radio Club meeting, David McAuley, VK3EW, received both his WIA 5 Band DXCC and WIA 9 Band DXCC certificates from WIA President, Michael Owen, VK3KI.

Michael paid tribute to National Awards Manager, Mal Johnson, VK6LC, who had taken the opportunity presented by the restructure of the WIA to not merely remove the word "Federal" from the awards, but to create a whole range of new, exciting and attractive awards.

A 9 band DXCC is no small achievement. 100 stations in 100 countries 9 times over are, as the certificate says, 900 countries! To achieve that involves rare perseverance, equipment that really works, and special skills.

First Foundation Licence Issued

Some 16 people qualified at the Foundation Training Course conducted by the Gold Coast Amateur Radio Society over the weekend of 16 and 17 September 2005, involving a group of WIA Assessors, led by Nominated Assessor, Ron Bertrand, VK2DQ. The first Foundation licences were issued the following Friday, 21 October 2005, after ACMA's Determination creating the licence came into effect on the previous Wednesday.

The very first licence issued was issued to Amanda Gray.

Amanda, a legal secretary, was encouraged to undertake the training course by her husband, Chris, VK4XWD. They have two children, aged 6 and 3, and so life is very busy!

Amanda says that she was not really convinced about the course before she started it, but she really did enjoy it and became genuinely interested as a result, so much so that she had been helping Chris erect an antenna.

She had asked for the callsign VK4FRST before she knew that her licence was, in fact, the first Foundation licence issued in Australia, because she thought she had to be a first something, perhaps the first mum to get a Foundation licence, and was a bit embarrassed when she was told that she really was the first.

At a special meeting of the Gold Coast club on Sunday 23 October 2005 to mark the issue of the new licence, WIA President Michael Owen, VK3KI, stressed the responsibility imposed on the WIA and the clubs to make sure that the new assessment system retained credibility, while hastening slowly to avoid errors but to meet the real demand for the new licences as soon as practical.

On behalf of the WIA and to mark her achievement, Michael presented Amanda with a copy of the just released ARRL handbook, and a WIA satchel.

Doug Hunter, VK4ADC, from Ozgear, Brisbane, presented Amanda with an Icom radio, on behalf of Ozgear and Icom. Amanda and Chris both became WIA members on the spot.

Queensland clubs meet with WIA President

Members of the Queensland Advisory Committee and representatives of some 13 radio clubs, including one CB club, met with WIA President, Michael Owen, VK3KI at a lunch function on 22 October 2005 in Brisbane.

The clubs came from as far north as Townsville and included clubs from Rockhampton, Dalby, the Sunshine Coast, the Brisbane area and the Gold Coast.

continued on page 48

Are you ready for action?

Bill Isdale VK4TWI

Part One

In the near future encoded transmissions will be permitted for such things as control of radio apparatus on satellites and for communications during emergency services operations and training.

The meaning of this is yet to be established and in today's world it is not realistic to expect that an agency of government will spell everything out in detail. These days it is the fashion that there be "more steering than rowing" and it is likely that some flexibility in carrying out a new policy will be left to those doing so.

It will be necessary to continue to provide communications facilities to augment those of the emergency services, probably at effectively no notice.

Those services are beginning to move into digital communications and no doubt experiencing their own learning curve as they realize that digital systems have shortcomings as well as advantages. One feature is that there is either a good signal or none at all with no middle ground. There will be areas of no coverage where conventional analogue systems may have provided a poor but useable signal.

Some digital systems can be received with equipment that may already be in the shack but a number of networks are now also encrypted to provide privacy to the users. This will also prevent monitoring and relaying of messages by volunteers in times of emergency.

Clearly, the users of these systems have closed them to the world in order to gain some security. In the event that there is a serious emergency, however, their natural inclination to be self-reliant may put them beyond easy access to improvised help from those with communications training and equipment.

This is a foreseeable difficulty. What can realistically be done to provide communications when compatibility has been deliberately precluded?

The rationale for implementing a closed communication network will rule out volunteers being permitted to have their own hardware equivalent to that used in the official network. It will just not be possible to fill in gaps in that system seamlessly even at a time when the need for security may be less pressing than the need for interoperability. That opportunity has been closed off. It will be necessary to do what is possible rather than lament what is not.

What can easily be provided is what is already available, a stand alone operation using the frequencies and modes available to us. That will certainly be useful but if security is required then the familiar modes may be unacceptable to the emergency services for passing some or all of their traffic. After all, where is their security if they fall back onto an open system in a crisis? It would make a nonsense of their system if, when there is a serious emergency, they pass the same traffic over open channels to places where their system will not reach.

The choice would be not to use the open system and to maintain security at the price of perhaps a partial blackout in areas not reached by the official network or to communicate using conventional modes. If the latter, then using that to its full potential means a loss of security. A compromise of using that open system in a way that does not break security will reduce the scope for effective communication.

This is not a particularly pretty picture but a decision along these lines will be likely to be required in an emergency.

If encoded transmissions are able to be provided in aid of the civil authorities then although not compatible with their systems, they are probably going to be of some use, especially when there is likely to be an increased perceived need for security, whether or not the need really still exists. During an emergency is not the best time to try to convince someone that they don't need security; it is probably best just to provide it.

If we have the option of using encoded transmissions then it can be offered. As to what "encoded" means, we can begin to consider the concept.

At present, there is not much guidance as to the content of the expression and there is even less in the way of generally accepted technical standards and equipment available in the amateur radio market in this category. It will not do much good if we try to use pieces of equipment that cannot talk to each other.

Voice communications devices using standardized digital modes that can fit a reasonable definition of being encoded are well developed and in common use. They are usually called mobile telephones. Events have shown that the mobile phone networks are relatively fragile and can be overloaded and ineffective when hordes of handset users are all trying to call at once, something that might be expected in an emergency. Those systems are not nearly as robust as the plain old telephone service.

We are not contributing anything if all we can offer is to use a mobile phone. It is a technology that we can't readily implement our own version of, as it is costly and of short range unless networked. We need a system as reliable as what we have now but with security added.

The optimum solution would be to be able to, for instance, add a hardware module at each end of a radio link to encode the outgoing signal and decode the received signal and to do so irrespective of whether there is a repeater in the link. It would be desirable to do this while using existing modes and bandwidths for the transmitted signal. This would help to achieve the goal of continuing to use existing transceivers.

A modem in line from the microphone could be used to digitize and perhaps also encrypt the signal and to similarly demodulate and if appropriate decrypt the received signal, which could be carried as, for instance, a conventional narrow band frequency modulation radio frequency transmission.

If this modem complies with an accepted standard then reliable and secure communication can be provided. The cost to the operator is the cost of the modem, The experience with internet modems suggests that this would rapidly decline with mass production, and this

can take place once there is a standard and a demand for the product.

Realistically though, we would be waiting a long time for this to come about. Perhaps we can solve the problem for ourselves.

Just for a moment, let us think about what we would have to come up with to meet the need for security.

Security can be defined as a reduced likelihood of some unwanted situation. It is a feeling of comfort, hopefully at least reasonably grounded in reality. It is a relative concept and for present purposes could be taken to have been achieved when the communication could not be made intelligible by a likely eavesdropper within a reasonable time; as after a while the information would not be topical anymore. Like a safe at a bank, it does not need to be able to keep a thief out for longer than such time as he can expect to have available to crack it.

For present purposes, no greater security than that achieved by the official network is necessary. In order to see how this can be arrived at it is necessary to briefly consider the likely attributes of an official system.

Our hypothetical system will be digital and use encryption which the manufacturer describes as "128 bit". The analogue voice input from the microphone is converted into a digital format, which can be thought of as a series of 1 and 0, or "on" and "off" instructions. When transmitted the digital signal will be heard as the static it resembles. Of itself, the digital mode excludes the casual listener. Digital receivers can be bought, so the encryption provides the main element of security.

It is common to hear encryption being described as "128 bit" so it is worth while considering what this means. It is usually thought of as an assertion that the encryption is "strong" or "unbreakable", often with an explanation that it would take all the computing power in the world a few billion years to "break" it.

That sort of fuzzy generality, no doubt meant to be satisfying, ought not to be an impediment to thinking about what is actually involved.

Any manufacturer who is experienced in encryption will make use of an encryption method, a mathematical algorithm, that has been demonstrated to be well designed to withstand attacks by the people who specialize in the branch of mathematics involved, cryptography. Someone who offers their own "proprietary" encryption is asking their customer to accept that it is strong without knowing anything about it. The customer could of course do that if they wanted to, but a published algorithm, which has withstood years of attacks by the world's experts, is more likely to be chosen by an emergency service. Let's assume that this has been done.

This is the equivalent of choosing a very reputable brand of lock for your front door. The lock mechanism is open to scrutiny and a good locksmith assures you that it has been tried and tested over the years. What makes it secure, as far as you are concerned, is the key. It is just the same for cryptography.

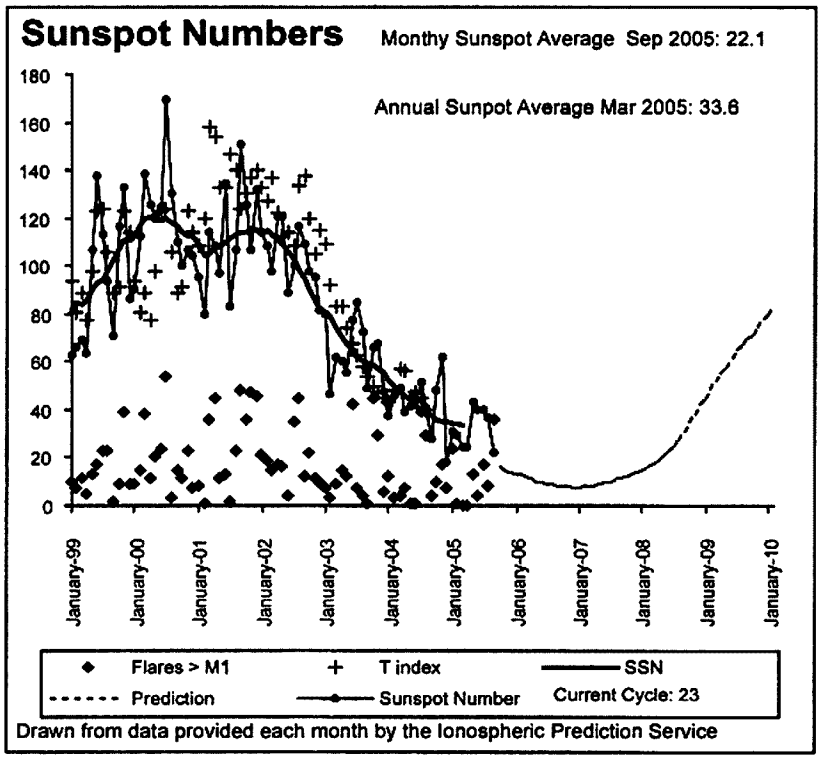
Our locksmith will set the lock cylinder to accept a key cut to push the pins inside the cylinder up against spring pressure to where it is released and can be turned so that the lock will open. There will be probably 5 pins and each one must be pushed up just the right amount. The locksmith sets the cylinder to require each pin to be pushed up to a certain point and the key is cut with ridges of the correct lengths to push the pins up to the right positions. We know that multiple locks can be set to accept the same key and that the lock cylinder can be reset to require a new key, although the locksmith will have to attend and remove the cylinder from the lock to set it for a different key.

The encryption algorithm is the lock; we choose one that is known to be good, and the encryption key which tells the algorithm what variables to apply in the encryption and decryption is the key to the lock. The same word is used in both situations and it describes the item perfectly.

The key used for encryption and decryption will be the same. This is known as a symmetric key, the same one is used for both purposes. This system is most likely to be used, as there will be multiple transceivers which need to be able to encrypt and decrypt messages. They must all have the same key. It can be programmed into them as software. If someone acquires an identical transceiver they cannot get any access to the information flow without the key.

The key will be a digital one, a string that will look something like this 110100111010001 and will simply be 128 characters, bits, long. The algorithm uses the 128 bit key to instruct it how to mix the digitized signal, also a stream of these 1 and 0, on and off, instructions, so that what is transmitted is not intelligible without the key.

(Part two of this article will appear in *Amateur Radio* December issue)



Drawn from data provided each month by the Ionospheric Prediction Service

A Morse frequency meter

Phil Rice VK3BHR
http://ironbark.bendigo.latrobe.edu.au/~rice

No, it doesn't measure your Morse! Instead, it is a frequency meter that announces the measured frequency in Morse code. It is another version of the Updated Digital Frequency Display published recently (*Amateur Radio* Sept 2005). Interested readers are referred to that article for a bit more detail.

How it works

As with the previous design, it uses a PIC microcomputer to do all the work. The LCD display of the previous version is replaced by a "loudspeaker" connected to pin 18 via a resistor of 470 ohm or more.

Three jumpers connected to pins 6, 7 and 8 allow the selection of 8 different Morse speeds, from around 8 wpm to 20+ wpm. The jumper on pin 8 has the greatest effect, the one on pin 6 has the least.

The PIC also has a 9600 baud serial ASCII output from pin 17. Pin 9 can be grounded to turn the Morse off, leaving only the serial ASCII output active.

A jumper on pin 2 sets the count resolution, either 3 or 5 digits after the decimal point (1 kHz or 10 Hz resolution)

See the previous article for details of the other jumpers on pins 10, 11, 12 and 13.

The extra transistors on the circuit diagram implement a push button "start" function. At the completion of one measurement, the PIC turns its own power off. This is inherently troublesome as the PIC may change its little mind. The power control circuit prevents this. The whole lot can be deleted and replaced by a single pole switch if you want.

Getting the software

The source code for this version is available on the web at http://ironbark.bendigo.latrobe.edu.au/~rice or I can mail a copy on disc.

If you don't want to go to the trouble of building a programmer and downloading the software (you will also need the Microchip PIC assembler), then I could visit my local Jaycar store and buy a chip. A cheque for $15 would cover my costs (the price of the chip plus postage).

The last word

That's it! Three frequency meters from the one author may be one too many. I couldn't resist designing one for the CW/QRP/OT brigade. If you want a simple cheap frequency meter then you have to embrace modern technology. You could always make believe the PIC is not a computer, just a fancy frequency meter chip!

ar

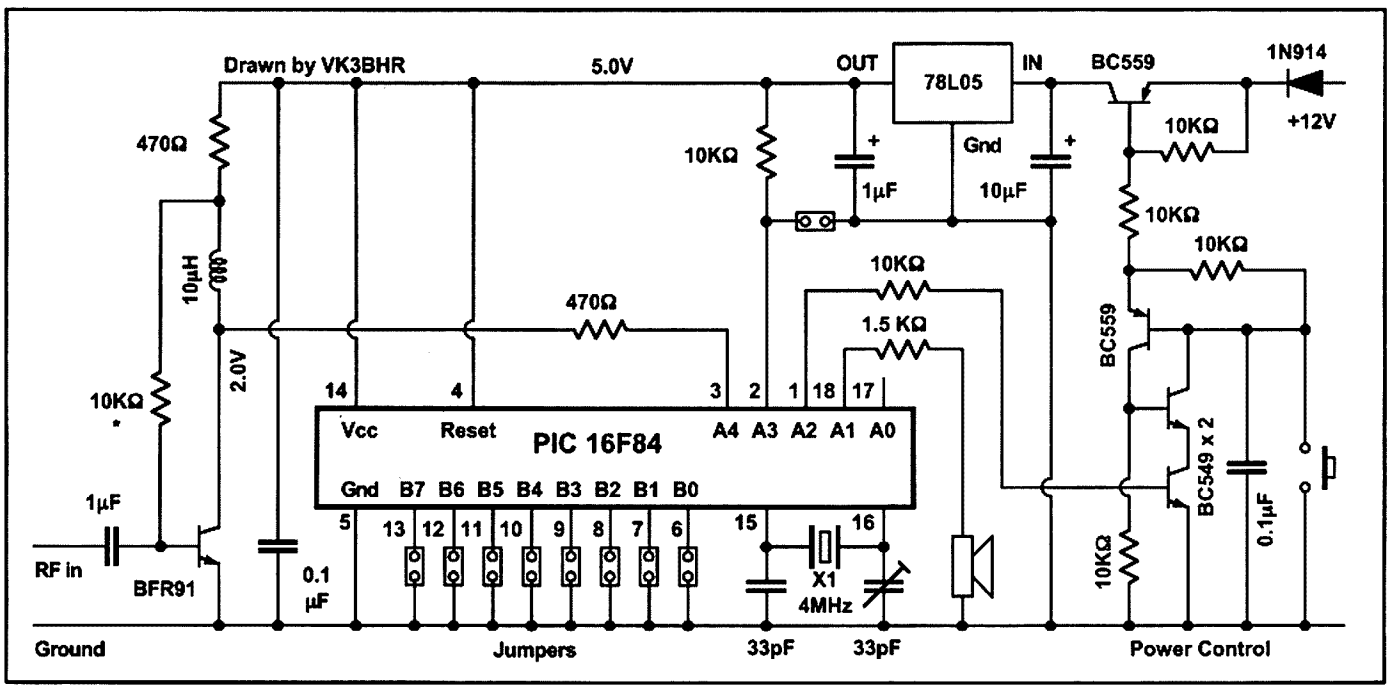


Fig 1 – Circuit of the Morse frequency meter.

Library amateur radio displays

Graeme Wilson VK6BSL

About October 2003 I spied in my workshop a couple of panels of MDF board about 1300 mm wide and 600 mm high, sitting there doing nothing. The light bulb in my head switched on and said these are just the right size for a display on Amateur Radio and Electronics to be exhibited in all of the Council libraries in metropolitan Perth for approximately two weeks at a time (about 40 libraries) .

I made a couple of aluminium wire hooks to fit through holes in the upper board and hang over the top of the approximately 1800 mm by 1800 mm display boards that most libraries use. It was preferable to use cloth covered boards so that all the QSL cards and other show-cards can be fixed by using sticky-back Velcro tape. I then fashioned two hooks to hang the bottom board from the top board (these boards easily fit inside a car).

To make the display more interesting I mounted four simple projects, a Foxhole crystal set (built by the Americans during WW2 and using a safety razor blade for the diode), a one watt crystal controlled transmitter built into a "Milo" tin, which has worked the eastern states, a working Morse Code oscillator complete with key, and a crystal set featuring an "S" meter which shows nearly full scale on our local ABC AM station.

In front of the display we put a table with some of the library's relevant books on it. Try to site the display in a prominent place near the reception desk if possible. We also make use of the Library's internet connection to produce about 10 copies of the International Space Station's sightings for Perth over the next few days. This is updated by the library staff.

The show-cards feature many of the different ways you can enjoy amateur radio and electronics, and the plentiful supply of junked parts from TVs, computers, etc, as well as the cheapness

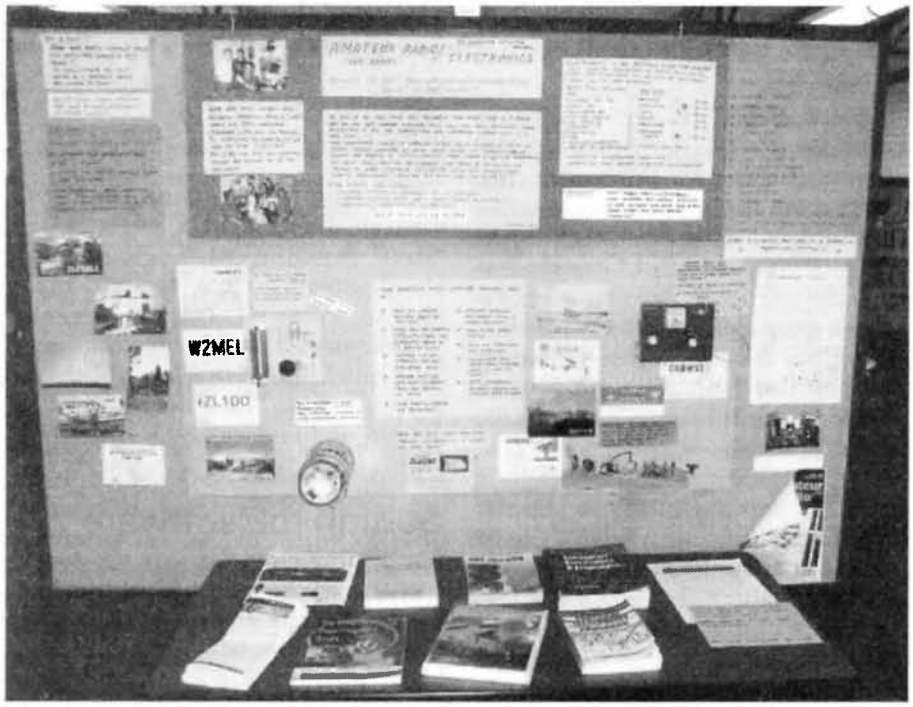


Photo 1 – The complete library display.

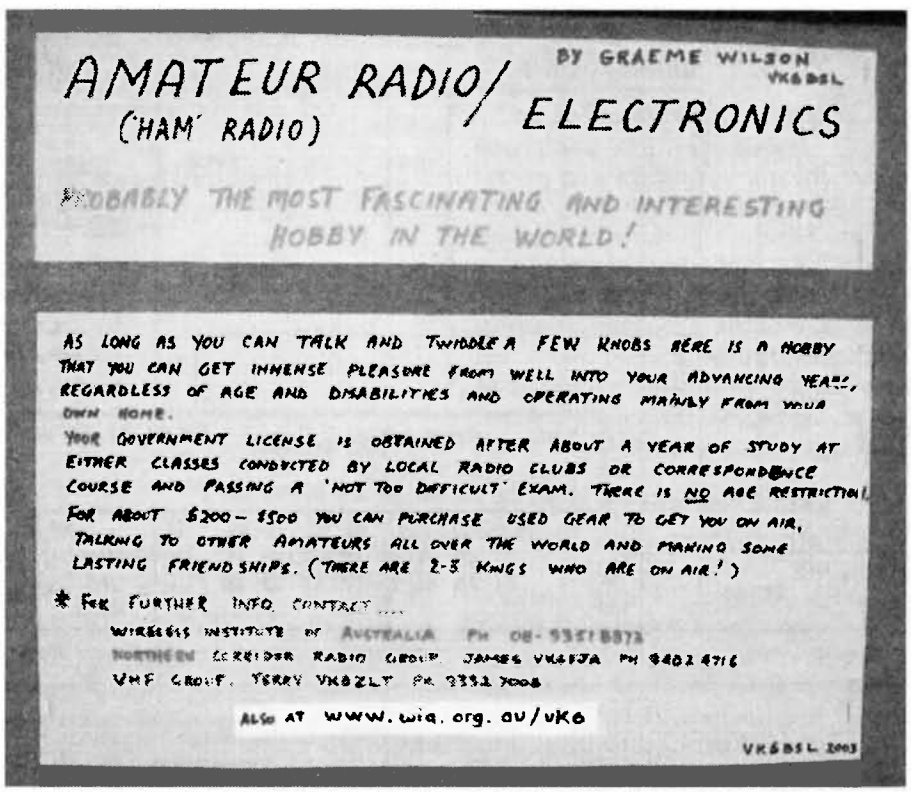


Photo 2 – The main text of the display.

and safety involved in most of the wide range of projects available to build or operate.

We have had the utmost co-operation from the display staff at all the libraries we have approached and several want the display back in a few months time. The reaction from their members has been gratifying and makes the project worthwhile.

After doing most of the north area myself I now have a very keen Kathie VK6KHR, a relatively new ham, doing the southern part and enjoying talking ham radio to future operators. Our local broadcast announces the whereabouts of the display each week.

I would be most happy to assist anyone who wants to duplicate our efforts to publicise the hobby in their own city or locality. Incidentally, we are looking for other amateurs to set it up in their local libraries south and north of Perth to spread the word.

ar

Photo 3 – Graeme VK6BSL with the Foxhole crystal set he made for his library display (photo from the Wanneroo Times, 14th October 2003).

Restoring an 18AVT multi-band vertical

Peter Stuart VK2BEU

In the February 2001 issue of Amateur Radio, Barry VK2AAB wrote about repairing the 80 m coil of an 18AVT antenna. This was helpful to me when I attempted the complete restoration of a 30 year old 18AVT which had lain on the ground in long grass for some years.

First inspection of the antenna revealed that a lot of work was in front of me. I found extensive corrosion of all screws and nuts, all the coils were open circuit, and there was surface pitting on all aluminium surfaces. The 80 m radials were missing altogether.

The first job was to give the existing aluminium tube sections a good cleanup using soaped Steelwool pads which brought the surface back to a bright finish. Some tubes had corrosion holes right through the tube wall. I rang around and found that Smart Aluminium at Wetherill Park in Sydney had a small stock of 1-1/8" OD tube which was just the right size. It was a simple matter to cut the tube to the right lengths and put a short longitudinal saw cut in each end (for later compression) using a bench-mounted circular saw.

The lower resonators for 10, 15 and 20 m are identical in construction, so once I worked out how to get one apart, the others came apart easily and all showed the same corrosion problem. Each coil has a tapered spun-aluminium weather cover which is fastened at the narrow end by three self-tapping screws. Carefully removing these screws (because they were rusted) I was able to slide each cover off one end of its coil by judicious tapping with a wooden mallet. Two black polyethylene ring spacers also came out. These sit inside the large end of the cover to maintain concentricity.

Inside is a coil of aluminium wire wound on a tubular nylon former which has a coarse pitch helical groove machined in it. In that way, the coils do not touch each other, so no form of insulation on the wire is necessary. The ends of the coil are anchored under the heads of self-tapping screws. These screws penetrate radially through the nylon former and into thick-walled aluminium tubes which protrude from the ends of the coils and slide into sections of the mast above and below. The zinc-plated self-tapping screws had corroded, losing contact with the wire and possibly with the thick-walled aluminium tube. I cleaned up all components in these assemblies, but most particularly the ends of the wire, and used stainless steel self-tappers to replace the rusty screws. When I had ascertained that there was a good circuit though the coil, I replaced the aluminium weather covers.

After reassembling each resonator, I made two plastic weather-proofing rings to go onto the open ends of two of the coils which are positioned with their open ends upwards on the antenna (why does Hy-Gain do this – they are a perfect rain catcher?). The rings were missing from the antenna but I was able to machine two new rings from ABS plastic, using the assembly sketches in the manual as a guide for the right shape.

There is an impedance matching coil in the bottom of the antenna, just above the SO-239 connector. I drilled out the pop rivets which gave me access to the coil. It was in good condition as it is surrounded by wax. I replaced the SO-239 socket, cleaned up all the connections, and reassembled the lot using 3 mm stainless steel screws and nuts, although everything was now squeezed inside because of the presence of the nuts on the inside. Aluminium pop rivets would have been better, but I preferred to use screws in case I had to dismantle it again.

That left me to fix the 80 m resonator, and here I had a bit of luck. Unlike Barry, I was able to tap off the metal end caps and so didn't have to hacksaw through the ends of the coil to get it apart. The outer fibreglass sheath slid off easily, exposing a close-wound coil made from aluminium wire, enamel-coated to insulate the turns. The ends of the coil pass through holes in the former and are anchored by steel screws into the inside faces of bronze end plugs. The bronze end plugs are tapped 3/8"-24 through their middle. The lower plug receives a zinc-plated steel stud, the other end of which screws into an aluminium threaded bush in the adjoining lower mast section. I thought this was a poor mismatch of metals which could lead (and had led) to corrosion, so I made two new end plugs from stainless steel and obtained a stainless steel stud. I also replaced the threaded aluminium bush in the adjoining section, so that I had only stainless steel-to-aluminium interfaces throughout my antenna. I have found that stainless steel and aluminium go well together in minimising corrosion.

I decided to anchor the coil ends by drilling and tapping M4 holes radially into the end plugs, through the wall of the coil former. The hole through the coil former was drilled out larger than the diameter of the screw head, so the screw sits low in it, and I used pan-head screws. This arrangement kept the screw heads low enough to allow the outer sleeve to slide on.

Finally I had to find out the length of the 80 m radials which had gone missing. A request on the VK2 Sunday broadcast brought four replies that the length from tip to centre of eye is 12". I used 1/8" aluminium wire, although I think stainless steel rod would be better.

To re-assemble the antenna I used stainless steel fasteners throughout. Originally, the clamps which tighten each tube section over the next-smaller tube used zinc-plated steel screws, which had rusted; so I made new square nuts out of 6 mm stainless steel plate and used M6 screws through them. I thought I had done a better job than Hy-Gain by choosing to use stainless steel fasteners throughout, but I have since noticed on their website that they have re-introduced the antenna (now known as the 18AVQII) and one of the new features is all stainless steel fasteners!

ar

Experiments in aircraft enhanced propagation

Barry Millar VK3BJM

In November 2003, I wrote an article about my trip to Waukarlnga SA, for the purpose of investigating Aircraft Enhanced Propagation (AEP) on 144 MHz and 432 MHz back to Melbourne. In conjunction with this, I have spent the last three years investigating AEP in far west NSW. This investigation stemmed from a trip in April 2001, to a place called Mt Manara.

In the beginning

Mt Manara is in the Manara Hills, 60 km northwest along the Cobb Highway from Ivanhoe. The purpose of the trip had been to activate the Maidenhead Locator (or "grid square") QF17xm on 2 m and 70 cm, and I had expected to exploit tropospheric ducting or meteor scatter to do this. This trip fell under the definition of "flying by the seat of your pants". I had no idea where exactly I'd be operating from, or how the land would lie – I just knew there'd be a range of hills out there. I was lucky – I found the landowner whose property the hills were in, and he gave me permission to camp at the survey marker. The surrounding plain had an average height above sea level of 90 m – the hills rose steeply from the plain, and the survey marker was at 175 m ASL. It was a fabulous view!

Unfortunately, conditions to VK3 were not so fabulous, and only allowed a single CW contact, on 2 m, into Melbourne. But on Sunday 22nd of April, I was persuaded (via HF liaison) to turn the Yagi towards Sydney. I was immediately told that my CW keyer was being heard by Gordon VK2ZAB, and to "go to voice". Contact was made on 2 m and 70 cm, both with amazingly good reports (up to 56 and 54 respectively). The distance to Gordon was 680 km. Later that morning I also completed on 2 m with Alan, VK2DXE.

Alan was instrumental in both setting up the contacts (he was passing messages on HF) and highlighting aircraft enhancement as being the mode of propagation. At the time he lived near Sydney Airport, and was able to tell me when an aircraft departed – we then timed starting our calls about 25 minutes later.

Finding AEP supporting communication from the far side of NSW was a big and very pleasant surprise – it turned the trip from a near disaster to a major success.

Research time

Back home, and with the assistance of several VKs, I started researching what was supporting these contacts. From Airservices Australia I obtained "En Route Charts" (ERCs). These are charts that show details for all flight paths over Australia. I also bought World Aeronautical Charts – 1:1,000,000 scale topographic maps of Australia.

I assembled eight of these maps into a single map covering the southeast corner

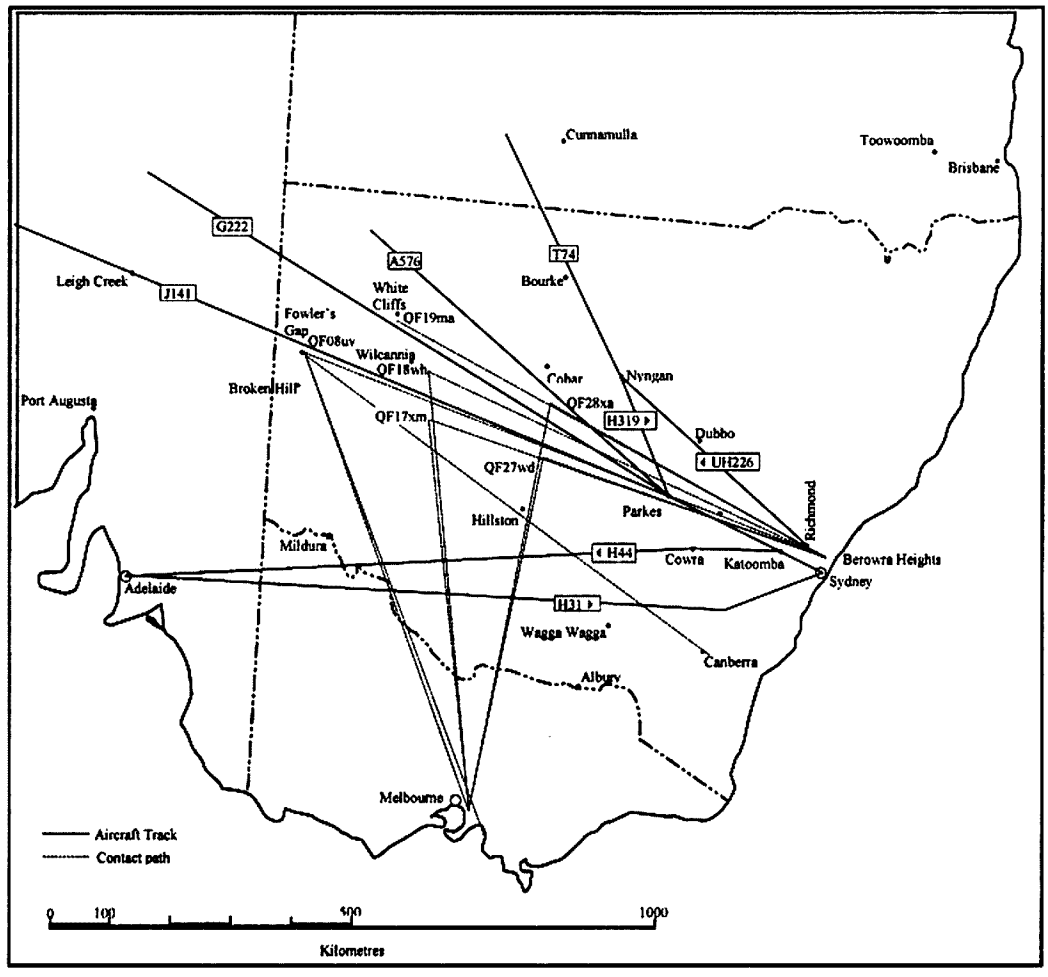


Fig 1 – Map of aircraft tracks and AEP contact paths

of Australia (south of the NSW/QLD border, and east of a line running north through Coober Pedy) and marked the high-level flight paths onto this map. When I marked on it the beam heading of the contact with VK2ZAB, I could see where it intersected the flight paths.

The important paths were those that carried international flights between Sydney and SE Asia – important because they are big aircraft (like Boeing 747-400s) and they are at high altitudes (around 41,000 feet). These paths head out over Katoomba to Parkes, where they diverge and form four different paths.

The first is called J141, and it leaves Parkes on a heading of 274°, continuing to the waypoint at Leigh Creek SA. For information's sake, at Leigh Creek J141 swings to the south west to continue on to Perth via the Kalgoorlie waypoint. This path carries domestic air traffic – but at high altitude.

The second is called G222, and is a two-way international path that leaves Parkes on a heading of 282°, travelling almost in a straight line over the Ayers Rock waypoint onto Broome, where it swings onto a heading of 296° en route for Jakarta. The inbound traffic is kept separate from the outbound traffic using specific altitudes for each; the outbound (from Sydney) traffic is higher than the inbound traffic.

Next is the path A576, which heads from Parkes at 291° to Alice Springs, then over Derby to Bali. On this two-way track, the inbound (to Sydney) traffic is higher than the outbound traffic.

Lastly there is the T74 track, known as such between Nyngan and Tindal Airbase in the Northern Territory. It splits into two separate tracks at Nyngan – one (H319) to Parkes and then on to other points; the Tindal-bound path UH226 is direct from Richmond Airbase to Nyngan. Obviously this is for military traffic, so flight schedules are not likely to be available! However, the traffic is very high – between Richmond and Nyngan the minimum safe altitude is 55,000 feet.

For working back into VK3, the domestic flight paths between Adelaide and Sydney were suitably located near the radio path midpoint, albeit nearly at right angles – which meant propagation would be brief.

Now that I had the propagation-supporting flight paths marked on the map, I could then select other operating spots ensuring that the beam headings intersected these flight paths in a favourable way – around the midpoint between my spot and the station to be contacted.

Trip number 2 – November 2002

In mid-November 2002, I returned to the area for more trials. I had more time available and I travelled in a large loop – up the Cobb Highway to Wilcannia, east along the Barrier Highway to Cobar, then south down the Kidman Way. I stopped overnight at four locations: (1) Mt Manara, (2) a spot in the MacCullochs Range (50 km east of Wilcannia) – QF18wh, (3) near Killala Station (50 km south of Cobar) – QF28xa, and finally (4) Mount Hope – QF27wd.

Sixteen contacts were made into Sydney, and with numerous stations, on both 2 m and 70 cm. While near Wilcannia and Cobar, I was close enough to the aircraft flight paths to see the aircraft passing – in fact they would wake me at 6 am each morning. The aircraft were seen both coming from and heading towards Sydney. From Killala Station, it was just possible to watch the aircraft change course slightly as they reached the waypoint at Parkes.

Nineteen contacts from these four locations were also made back to Melbourne and Geelong, from AEP provided by the Sydney-Adelaide flight paths.

The Wilcannia – Sydney contacts were achieved at a distance of 712 km, while those back to Melbourne were at a distance of 697 km.

By now I had satisfied to myself that contacts from the west of NSW could be made reliably and regularly. Now I wanted to see how much further west contact could be made from. Next month I'll tell you how the subsequent two DXpeditions went in exploring this.

ar

Silent key

Julie Kentwell VK2XBR

It is with regret that I announce the passing of Julie Kentwell VK2XBR.

Julie was known to many people and radio inspectors as "The Batman" during the early years of CB in the 1970's. Julie served a short period of time in Long Bay Jail for, as he put it, "Using the King's Airwaves without the King's permission". An achievement he was proud of.

At times through his life he stubbornly refused to embrace new things, he often later excelled at them. Julie obtained his ham ticket in 1977 and married his wife Jenny in 1980 who later under Julie's guidance become VK2PIG. Jenny passed away in 2001

Julie's talent for electronics and mathematics found him employment in the Television servicing industry. Television made up a big part of Julie's life, visitors to his place would be confronted by televisions at every station, including the toilet.

As a ham, his talents were focused on Amateur Television and he built many of the parts of the first Amateur Television Repeater with it's output on ch35 UHF in the 50cm band. (It is still in operation today on 444MHz in the Sydney area). This led onto the formation of the Sydney Amateur Television Group in 1985. (SATVG).

He also served on the WIA council for many years and the Sunday broadcasts. Some of which had listeners in stiches of laughter and others less amused. His talents were spread widely from Mathematics to Orthography, Music to Morse, Cicadas to Chemistry, Politics to Poetry.

Julie was a person who affronted many people. But he often made more friends than not.

I once heard him say, "Life isn't about having good cards, it's about playing a poor hand well".

Submitted by TRASH - VK2XSO

A Tetrode Tester

Drew Diamond VK3XU
Photos: Andrew Diamond

For various technical and economic reasons, tetrodes remain in use in a significant number of amateur transceivers. indeed, many recently built homemade transmitters and audio amplifiers use power tetrodes or pentodes in their output stage. It is still possible to buy new EL34, KT66 and 6L6 tubes from at least one well-known electronics retailer, and several USA mail-order businesses can supply just about any power tube that the radio amateur or audio enthusiast may require.

With our well-earned reputation for frugality, the typical amateur becomes adept at finding, negotiating, bartering (and, as a last resort, buying) used and new tubes from all kinds of sources. To test a tube of unknown goodness, it is usually necessary to open up the equipment, plug in the tube and measure the output signal obtained, and thus get some idea as to the serviceability of the tube. It is quite usual for tubes to be configured either as parallel or push-pull pairs, and so some simple means of testing individual tubes, and matching pairs, is highly desirable.

Offered here is an outline, using obtainable components, for a basic, effective, and safe, quasi transconductance/mutual conductance tester for tetrodes and power pentodes of the type typically used in audio power amplifiers and older style amateur transceivers.

Circuit

To test a tube and obtain an estimation of its usefulness, it is necessary to power the heater, provide a positive dc supply for the screen grid (g2) and plate (p), and an adjustable negative supply (with respect to cathode) for the control grid (g1).

As there are no catalogued power transformers easily capable of supplying the few hundred volts needed for the plate and screen, the simple trick of back-to-back connected identical low-voltage transformers is used. See circuit Figure 1. Selectable voltage for 6 or 12 V heaters is obtained from appropriate taps on transformer T1.

The 15 Vac winding of T1 also powers a voltage doubler circuit which supplies an adjustable negative potential for the control grid (g1). A dual 10 k gang pot is parallel connected as shown to improve reliability of this part, and assure a smoothly adjustable grid supply.

Normally, the plate and screen are powered from a supply that is positive with respect to chassis. However, for tube types whose plate connects through a top-cap (tc), a real shock hazard exists where the operator may accidentally touch the cap whilst some other part of the body is in contact with chassis or ground. A shrewd expedient is to simply invert the test circuit so that the positive side of the plate supply is at chassis ground potential, and thus the cathode carries the high potential.

In order to estimate a tube's transconductance/ mutual conductance, plate and screen voltage should customarily be held constant for the measurement (References 1, 2 and 3), but a series resistance of about 2.4 k is included here to limit plate and screen dissipation. Plate plus screen current is monitored with a 0 ~ 100 mA meter, and grid volts are measured with a 0 ~ 50 Vdc meter.

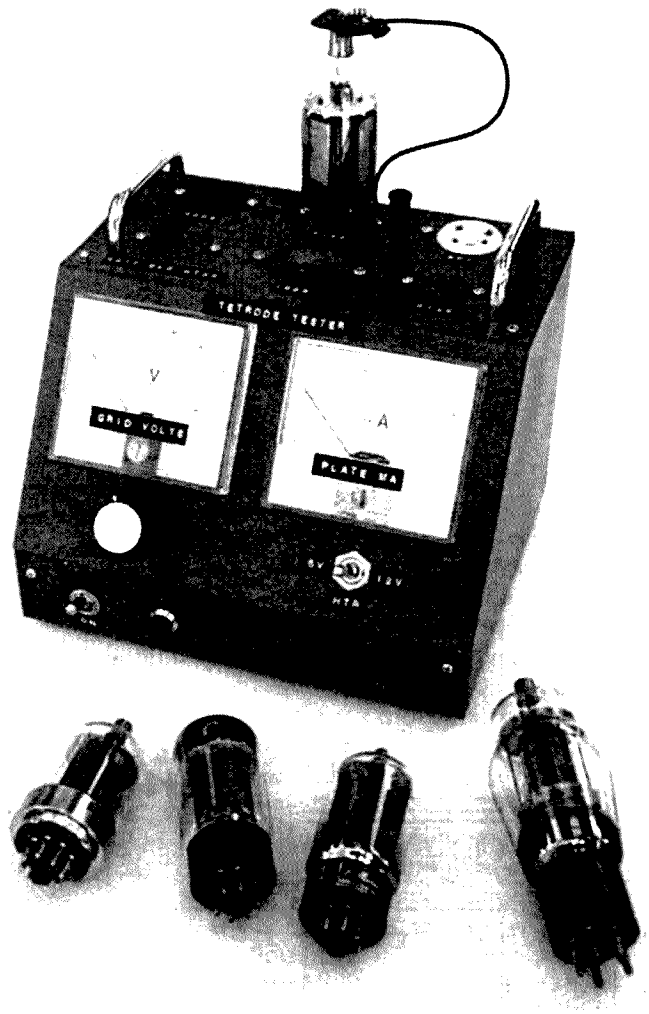


Photo 1 - Tetrode Tester.

My shack has equipment which uses 6146, 6L6, 6JS6, 6DQ6, 807 and 1625 type tubes, and so six individual sockets have been wired accordingly. During the experimental phase it was found that, due probably to parasitic wiring capacitance and inductance, some tube types would burst into oscillation during testing. A simple and effective cure is to fit parasitic stopper resistors of 100 ohms at the plate and screen pins, and a 4.7 k resistor right at the grid pin for each tube socket.

Construction

The homemade 1.3 mm sheet aluminium case, shown in Photo 1, measures 155 x 185 x 220 mm HDW. My 60-degree sloping front panel allows easier viewing

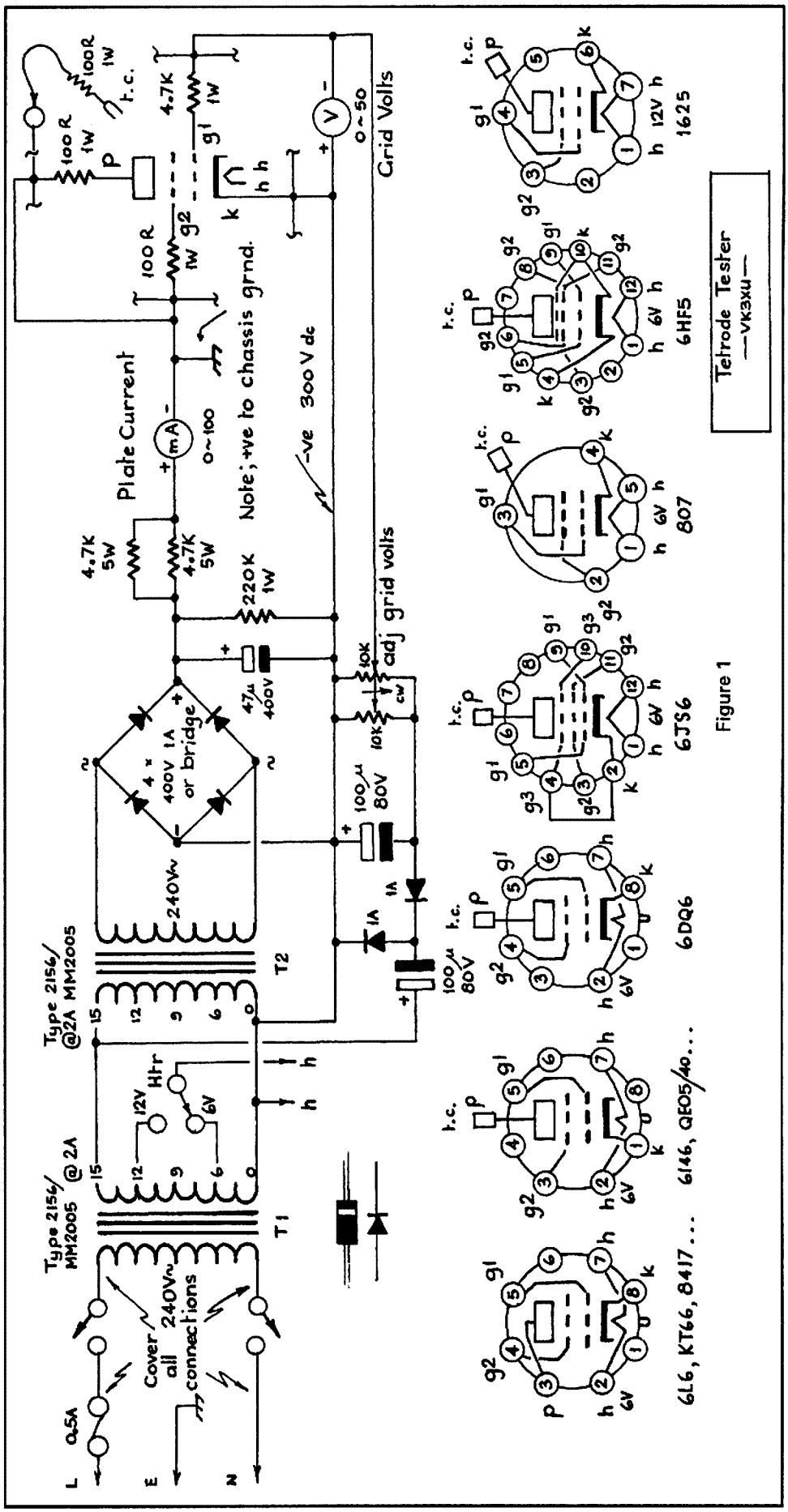


Figure 1

of the meters. Naturally, any metal box of similar size should serve.

A suggested layout is illustrated in Photo 2. Two 16-lug tag boards accommodate the rectifier diodes, filter capacitors, 220 ohm 1 W bleeder and 4.7 k 5 W wire resistors. Ordinary hook-up wire is satisfactory for the grid supply and screen/plate supply. Wiring for the heater supply and 6 V/ 12 V switch should be made with 24 x 0.2 mm hook-up wire. Note that all connections on the mains side of T1 must be suitably covered with heat-shrink tube or spaghetti to prevent accidental contact.

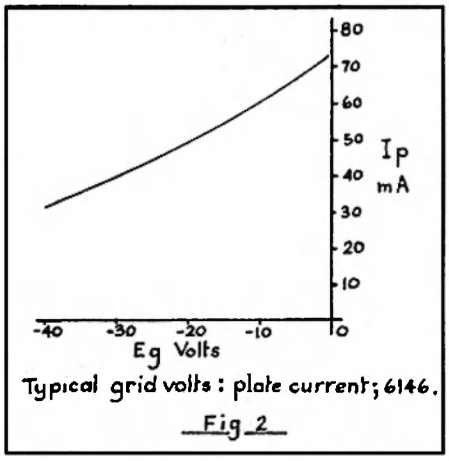
Install a socket for each tube type required, wired according to the pin-outs shown in Figure 1. The schematic attempts to show that the relevant elements (g1, g2, etc) are paralleled for each socket with the exception of top-cap type tubes, for which a single banana socket is provided, into which is plugged a "wandering" lead fitted with a plate connector and 100 ohm suppressor resistor (visible in Photo 1).

The screen pin of each socket may simply be connected to a chassis lug adjacent the socket via a 100 ohm resistor, as also may the 6L6 (etc) plate resistor. The grids (g1) may be fed with a single-strand bus wire, to which is soldered a 4.7 k grid stopper for each socket. Note that power pentodes (like the 6JS6) must have their suppressor grid (g3) connected to cathode (k) where appropriate.

Operation

Upon first power-up, carefully measure the main HT supply with a multimeter and confirm that you have about -300 Vdc with respect to chassis. Rotate the grid volts potentiometer and observe that it can be adjusted from 0 to about 40 Vdc.

Set the heater switch to the correct voltage, and then plug in a tube to be tested. As the heater warms up, the plate current meter should deflect. Vary the grid voltage pot and observe that plate current decreases smoothly as grid voltage is increased. A typical Eg: Ip curve for a 6146 tube is shown



Typical grid volts : plate current; 6146.

Fig 2

in Figure 2.

This functional test checks a number of things, particularly if a known good tube is available for comparison. We can determine that the:-

- heater is working,
- cathode has sufficient emission (if a tube has low emission, it is not possible to obtain a high Ip at zero grid volts),
- plate current varies in direct response to changes in grid voltage, and that therefore
- the tube probably does not have significant faults, such as leakage between g1 and other elements.
- When allowed to "soak" for some minutes, plate current should remain steady when grid voltage is held constant. A gentle tap on the side of the envelope will show up any "intermittents". Furthermore, a slow but notable variation in plate current (when warm) indicates that the tube may be "gassy".

Viewed in the dark, a faint blue fluorescence may be observed on the inside of the glass envelope. This indicates that the tube is probably quite new, and "hard". Conversely, a blue-pinkish glow in the space between the elements indicates a "soft" or "gassy" tube.

There is no test for heater-cathode leakage. However, as most power tubes are operated with their cathode(s) at or near ground potential, the existence of moderate leakage should not seriously affect operation.

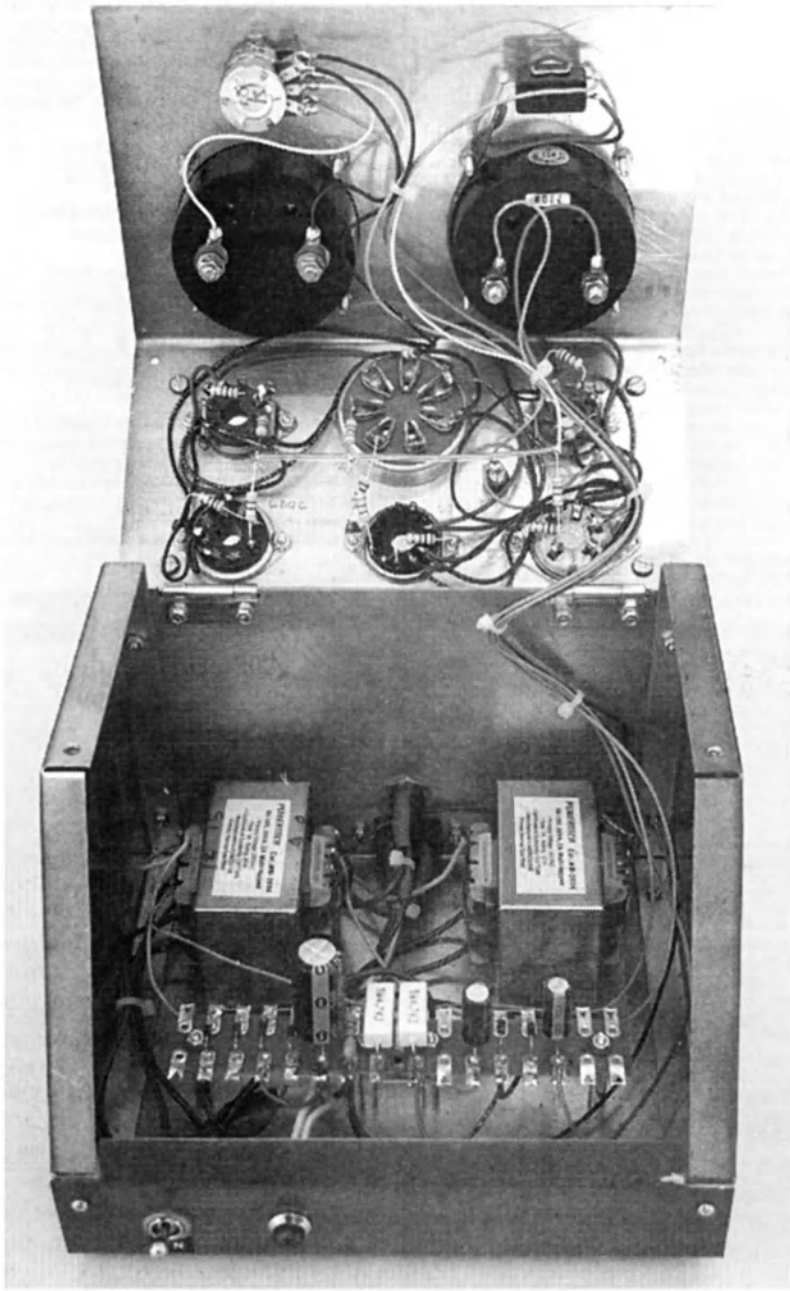


Photo 2 - Internal view, suggested layout.

Parts

It happens that most of the conventional components, including transformers, diodes, resistors, capacitors, tag boards, and switches, etc were purchased from my local Jaycar, but similar suitable parts are also collectively available from the other well-known electronics retailers.

Ordinary 8-pin octal tube sockets are obtainable from one or two local suppliers. However, the 12-pin Compactron socket for the 6JS6, and 7-pin for the 1625, may be locally problematic. These, and many other types, are available from at least one well-known US mail-order business, Antique Electronic Supply - www.tubesandmore.com

References and Further Reading

1. RCA Receiving Tubes; Technical Series RC-23, p559.
2. The ARRL Handbook for Radio Amateurs; Chapter 13 in any recent edition.
3. Radio(tron) Designer's Handbook; F. Langford-Smith, AWA/RCA , 4th edition, p15.

ar

TTS Systems Communications Equipment

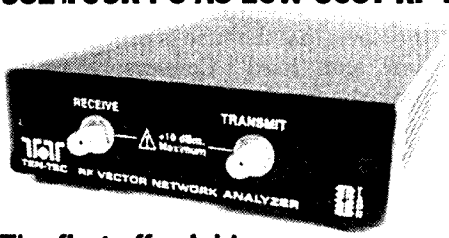
TTS Systems www.ttssystems.com.au **FREE CATALOGUE**

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

Never seen in AU before! VNA by TEN-TEC

USE YOUR PC AS LOW-COST RF VECTOR NETWORK ANALYSER



The first affordable access to many capabilities of conventional bench-top Network Analysers. Covers 200 kHz to 120 MHz. Test low power amplifiers, characteristics of coax cables, measure and adjust filters, check antenna impedance vs. frequency, antenna SWR, measure the length of transmission lines using TDR feature (Time Domain Reflectometer). The VNA measures forward/reverse gain and phase response of a circuit. Also measures input and output reflection (complex impedance) and provides S parameters. Make measurements of one-port networks (input, ground) and two-port networks (input w/ground, output w/ground). VNA also functions as general purpose signal generator. Frequency accuracy in either analyser mode or signal generator mode can be enhanced with use of customer provided external frequency reference.

Load the software on your Windows based PC and connect to a USB 1.1 compatible port. Software currently provided with VNA was developed by TAPR (Tucson Amateur Packet Radio Corporation). An open-source free version and other info is available on the TAPR web site. A Linux version is under development. All displays and plots are derived from these four measurements:•S21 Magnitude: gain or loss of two-port network from input to output. •S21 Phase: the transfer phase of two-port network from input to output.•S11 Magnitude: return loss of one-port or two-port network referenced to input of the network.•S11 Phase: the phase angle of return loss of one-port or two-port network referenced to input of network.

Specifications

Freq Range: 1 MHz-100 MHz at full spec. Operational with degraded perf. up to 120 MHz,down to 200 kHz.

Resolution: 0.1 dB for amplitude measurements 1 degree for phase measurements

Dynamic Range: in forward mode, 80 dB at lower frequencies 75 dB mid-range and higher frequencies In reverse mode, -35 dB at lower frequencies -25 dB at mid-range and higher frequencies

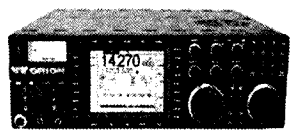
Output Power: nominal +3 dBm (approx. 2 mw) at TRANSMIT connector

Maximum Input Level: +10 dBm (2 V P-P) into TRANSMIT or RECEIVE connector.

Requirements for host PC: Windows 98SE, 2000 or XP. Also requires Windows installer program and NET 1.1 framework (provided on CD) run time package.

Included with Model 6000 VNA: printed instructions to assist with installation. The latest version of PC software and detailed operating manual are provided on CD. Set of testing and calibration accessories: 1meter & 3meter cables, 10dB & 30dB attenuators, 50ohm load, shorted connector and barrel connector. 100-240 VAC, 50/60 Hz power supply with removable cord.

TEN-TEC Orion II

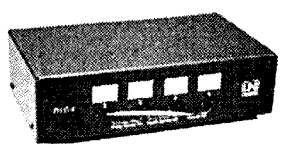


TFT color display, CCFL backlighting.

New 32-bit control Freescale DragonBall Super VZ chip. processor RS 232 remote Faster (stock) sweep with finer resolution, enhanced DSP ORION II-specific roofing filters allow selection of the absolute ideal mode, band conditions, and personal preference. ORION II comes standard with 20, 6, 2.4, and 1 kHz installed. Optional filters are 1.8 kHz (model 2000), 600 Hz (model 2001), 300 Hz (model 2002). That's not all - the optional filters cost less than before! Self-correction for frequency stability.

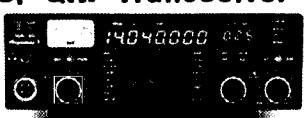
Digital mode operation—variable (programmable) line level output on rear panel independent of front panel controls. Popular 8 pin mic connector,

LDG DTS-4 Desktop Coaxial Switch



Switching between antennas no longer requires under-desk acrobatics to connect up. LDG DTS-4 Desktop Coaxial Switch switches your rig between 4 antennas with the press of a button. 4 in 1 out coax sockets on the back.Small desktop footprint. Red LED indicates the antenna in use—button-touch grounding The DTS-4 senses when rig is off or if power fails, and automatically grounds all antenna inputs, restarts at last used.Available compact remote control box (DTS-4R) gives even smaller desk footprint. 1500 watts of RF power on HF (1000W on 6M),

Model 516 Argonaut V IF-DSP QRP Transceiver



IF-DSP, modern 20 watt HF transceiver. 20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjust 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP). Metering measures forward or reflected power in switchable 2 or 20 watt scales.

We have

SGC

SGC 237 Waterproof Auto Tuners

SGC 239 Economy Auto Tuners

Autek Antenna Analysers

Autek RF 2kW in-line Power meters

LTT Lutron

Lutron Measuring Instruments

Vantage Pro Weather Stations

MAC-200 MASTER ANTENNA CONTROLLER (Smartuner Built-In)

Control up to 5 Antennas

Select the right antenna, for right band, at right time. The Master Antenna Controller is your base station control center, no switching and tuning. You select from five antennas and automatically get minimum SWR. Monitor your power and SWR. With MAC-200 you control your antennas.

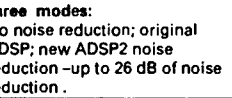
ADSP SPEAKER

SGC

Three modes:

•no noise reduction; original ADSP; new ADSP2 noise reduction –up to 26 dB of noise reduction .

LDG ELECTRONICS



z100 TUNER ANDZ1000 HIGH POWER AUTO TUNER

TEN-TEC KITS

Ten-Tec 3003 Acro-Bat antenna hanger.

UV resistant, S/S hardware. Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna.

Order your 450 ohm Ladder Line NOW

SG-237 Smartuner™

High density surface mount components in a 4 layer PCB on chassis: high efficiency, reliability, performance, excellent electrical and RF ground system. Weather resistant, factory-sealed ABS plastic.

MULTIPLE APPLICATIONS -- Use for base, mobile, portable, marine or aviation. Rugged and small gives max. flexibility. 100W power, coverage to 60MHz, matches most popular HF transceivers. Use balanced or unbalanced antenna: whips, backstays, dipoles, loops and longwires, only 28 feet of antenna for full coverage operation.

Full info available—ask

BUDDIPOLE

Dipole — vertical... Fits in travel bag! Optimised for transmit power, proven for DX work. Ultra light materials, High-Q coils. Zero-loss balun with Quick-Connect feedpoint.

Standard Comes with—

- Two 22" black aluminium arms. Two multi-band coils (40- 10m), adjustable coil tap pre-marked system • Two SS telescopic whips, VersaTee™ w 3/8" x 24 adaptors
- 8NC/PL259 coax connector, 25' of RG58 coax
- Carry bag

DATV down under (Part 1)

Richard L Carden VK4XRL

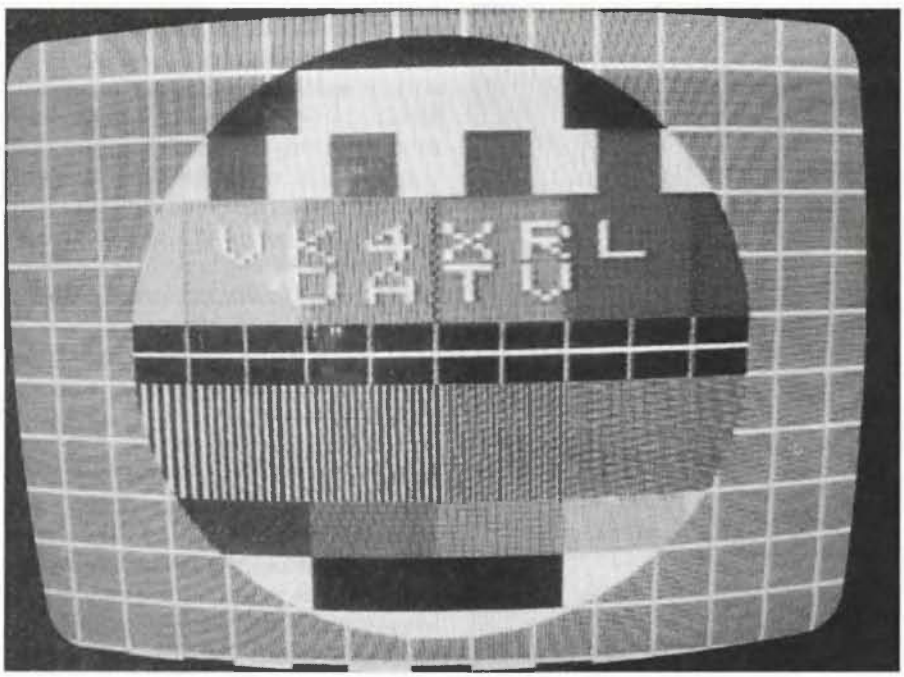
This article was originally published in CQTV 202 (May 2003)

December 3rd 2002 saw the first DATV transmissions from VK4XRL, the first in Brisbane and probably the first in Australia. Was it worth it and what were the results? Please read on.

Over the past couple of issues of CQTV we have seen many articles on DATV, some using DVB-T (mostly ex-commercial equipment) while others have used DVB-S. DVB-T uses the CODFM modulation system and, from an amateur point of view, the costs associated with such an undertaking would be prohibitive at this stage. The road taken after many hours of discussions was that of DVB-S. Our evaluation was, at the time, based on costs associated with CODFM and the uncertain future of the 70 cm band, at least here in Australia. Our belief was that, unless you were going to use 70 cm, then the slight shortcomings of DVB-S could be tolerated on the higher bands where most of the time it was line of sight. Also, DVB-S units were available, so tests could be carried out to ascertain if this was the way to go.

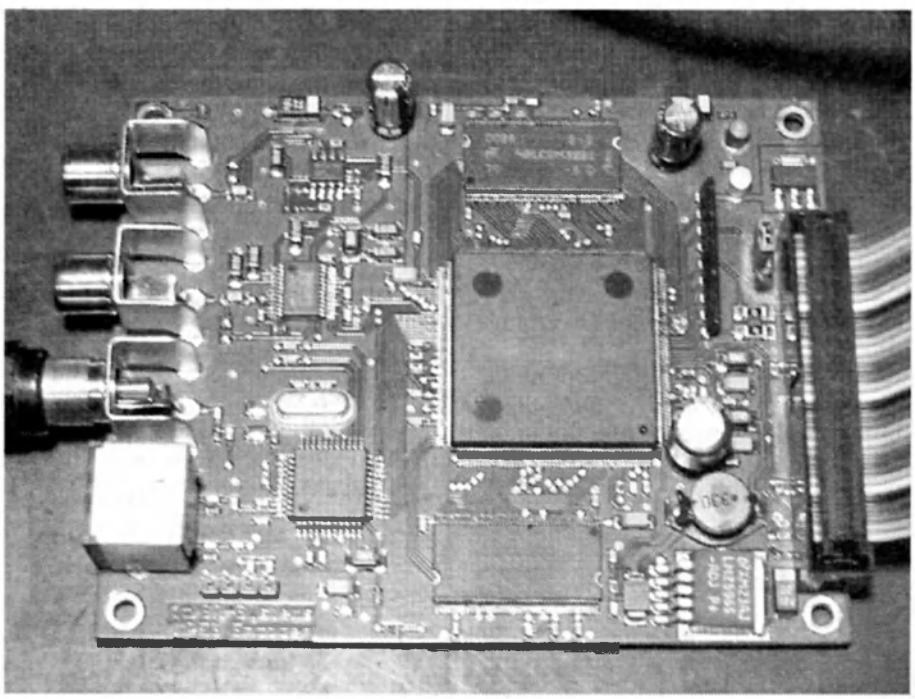
What system?

Three systems using DVB-S have been developed, one by the Dutch and two in Germany. The first system to be developed was that from the Bergische University by Prof Dr Ing Uwe E Kraus DJ8DW and his team. This system produced an output in the 70 cm band. The second system available was that from SR-Systems. The output from this system allowed dual operation in the 23 cm and 13 cm Band. Also, separate 23 cm and 13 cm units were available. The Dutch system was not available at the time we made a decision; however, their web site is worth a look at as it has lots of valuable information on the DVB-S system. From the above we decided to go for the system from SR-Systems. With thanks to Stefan we managed to arrange



VK4XRL at VK4TVD

VK4XRLDATV



DATV Encoder

for a set of boards to be purchased, which arrived in early December 2002.

DVB-S System

What did we receive for our outlay? Thanks to SR-Systems we were able to trace the package right throughout its travel. The box duly arrived and two boards were unwrapped (the third board, the modulator, was already mounted on the Baseband Board). No other information was included with the boards. The system as received was configured for 1291 MHz, FEC ¾ and Symbol rate of 6000.

The first test was just in the shack to make sure things worked and also the frequency was not one of our ATV allotted frequencies. The unit was duly connected to the spectrum analyser with power and video connected. The satellite receiver used for the initial tests was a Hyundai HSS-100C and the required parameters were entered as required. At switch-on the satellite receiver came to light and there was a received digital picture.

The unit came with a pre-loaded test picture and this was also received. I next contacted Stefan and, via return e-mail, a new file was made available with the required changes. Also surfing of the net at this stage brought to light some extra information on the units supplied by SR-Systems.

Arthur Lambriex had a very nice lot of information on setting up the software; also Rob Krijsman had an article regarding his first experiments. Both these articles were in English and I am indebted to these gentlemen as well as Stefan for the help I received. Upon loading the software I found I had a corrupt cygwin1.dll file. Stefan re-sent this file and all was OK. Next problem was to replace the testpic with one of my own. The program TMPGE was downloaded from the Web and, following the information from Arthur, a new testpic was up-loaded successfully. Before any tests could begin, a rack system was built to house the system to save any wrongly placed items causing a major problem.

Test Results

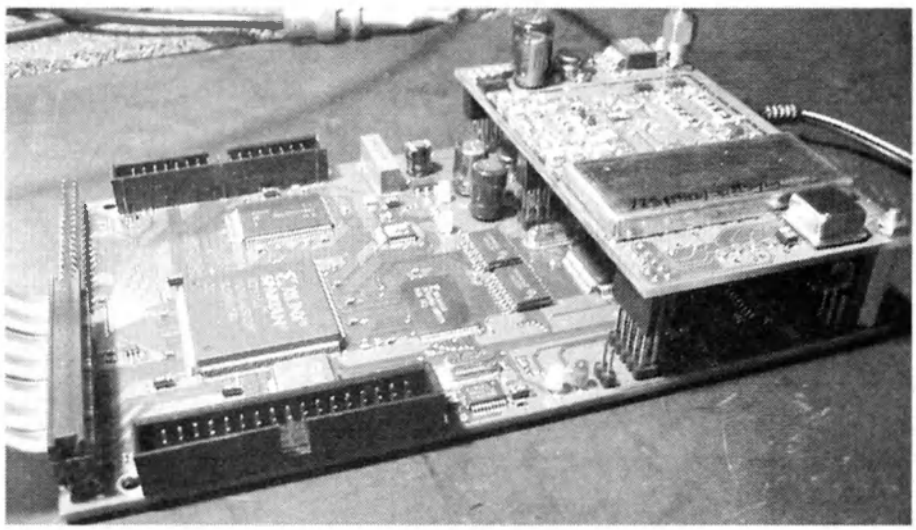
Tests from the modulator output produced an output of +6 dBm with shoulders sitting at –40 dBc at 1250 MHz. Bandwidth was at 8 MHz, which is right for the parameters used. Next, a M67715 power module was used for some extra output. A pad of around 8 dB to 9 dB was used at the input to keep the shoulders at least around –30 dBc. This produced an output of around 24 dBm. A second unit was built and the level was around 26 dBm. Information on the net indicated that varying results would be obtained using these devices. From this humble beginning we transmitted to VK4KI about two to three km away. Perfect pictures were received using a Nokia 5400 series satellite receiver. We were also able to test the Teletext system using this receiver. As yet we haven't tackled updating the teletext software, as the Nokia is the only receiver that has teletext. The Humax also gave great results, however both receivers switched the testpic on and off. According to the

handbook for the Humax, teletext should have worked via the teletext decoder in the television receiver but we couldn't seem to make that work.

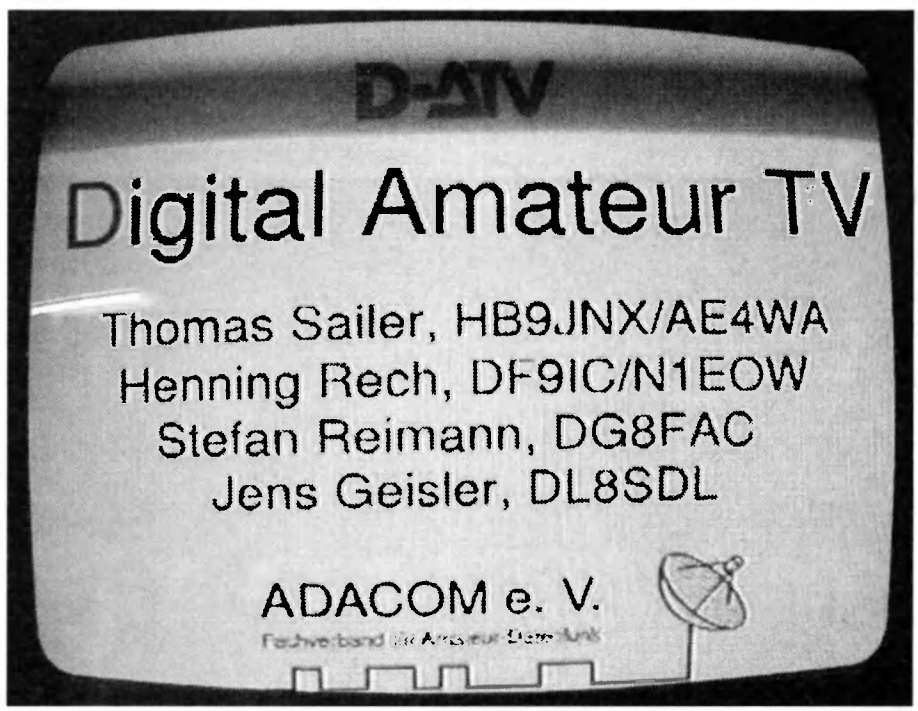
Further tests were then conducted from our repeater site at Ocean View about 54 km north of my QTH here in Brisbane. This produced astounding pictures, especially as we were only using +26 dBm from the transmitter. The transmit antenna used was a 36 element Yagi while the repeater receive antenna was a quad loop. Pictures were exchanged in both directions with the repeater also retransmitting on 426.25 MHz AM. It may be possible in the future to combine two M67715 power modules to provide some extra output while still maintaining the shoulders at around –28 dBc. It was decided not to use the M67762 power module due to poor intermod performance as is. Although I have seen some mention on the Web using this device with modifications to the bias circuit for an output power of around 3 w, no modification details were available.

We also took the time to test a couple of class A amplifiers intended for UHF AM transmitters. These were TEKO units and the first unit consisted of a BFQ68 and a BFQ34 that had a gain of around 23 dB in normal operation. Checking on the data sheets revealed useable gain of 8.5dB and 8.8 dB respectively, an overall gain of 17db. Test results, however, showed only a gain of +11dB with an output of +17dBm for + 6dBm input. The second unit was fitted with a BFW34 and a useable gain at 1200 MHz of +7dB, according to the data sheets. With +6 dBm input an output of only +9 dBm was produced, a gain of only +3db! Total output from both units combined was +20 dBm for +6 dBm input, a total gain of only 14 dB. Further tests may be required to determine if better results can be obtained. One pleasing result was that the shoulders were at –38 dBc being due, of course, to the use of Class A type transistors which run on a +28 V supply. As a matter of interest the Marconi power-measuring unit showed an output power level of around +29 dBm whereas all other measurements were done on the Spectrum Analyser.

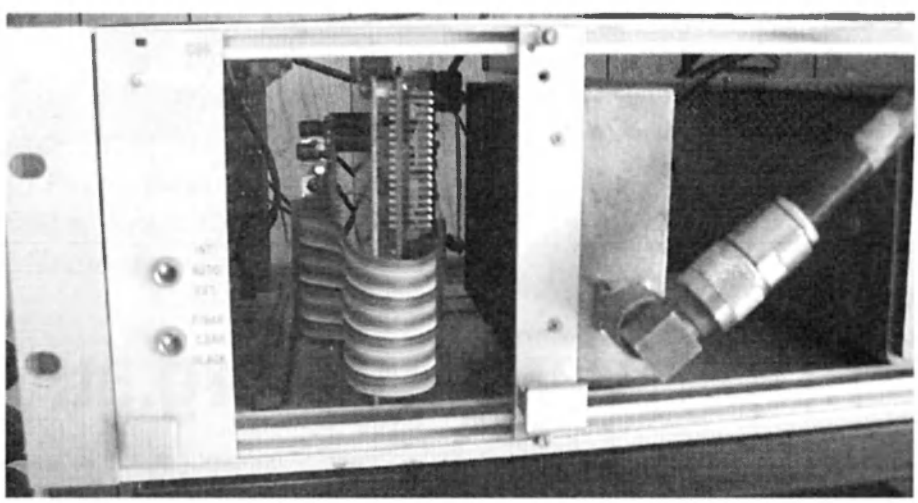
Further tests in the next few weeks will be carried out on 13 cm using a 2 W power amplifier and down-converter from Minikits here in Australia.



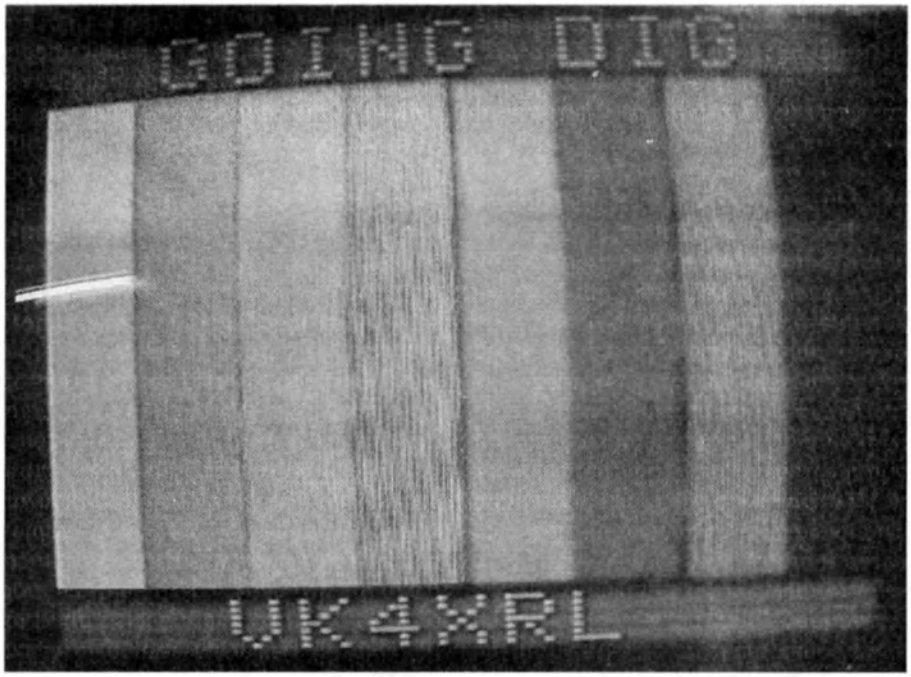
DATV Modulator



DATV Testpic



DATV Tx Unit



1st Received Picture

VK4XRL Ident

Audio

The information in regard to what audio levels to use was non-existent. The specification sheet for the PM1800 indicates (incorrectly stated as Analog Output) that FS (VIN = 0 dB) or 2.828 Vp/p. Note that Vin should read 0 dBV. From my understanding FS = Full Scale and refers to the maximum level, ie analogue clip level. It is also known as FSD, Full Scale Digital. From what information I have, the system should be operating at around –18 dB which is the EBU standard. There seems to be quite some confusion in this area. I am now in the process of making an audio interface board with +/- 3 dB level control with LED readouts, etc for each transport system in use. Maybe someone could design a LCD screen with readouts using a PIC.

Sending 0 Vu from my audio desk was causing distortion, which was around 1.2v P/P. We set up a test using the local satellite Optus B3 which has a test channel with reference audio tones. This level was monitored on the CRO and noted. Then our transmission was monitored and the audio level adjusted for the same reading using the same receiver. The required input level was found to be 0.5 V P/P that is around –16 dBV. This confers with levels noted by Rob Krijsman.

Conclusions.

Overall the tests have been very impressive with most people agreeing they were the best ATV pictures ever seen, and commenting on the quality and lack of noise. The power amplifiers will be the biggest challenge, especially going up to the higher frequencies. Also, I must admit that I would have preferred an IF of 70 MHz and then up-converted as required. The 70 MHz signal could then be split to all up-converters or feed via cable to the antenna combined with up-converter and amplifier.

One minor point was the use of test cards or colour bars for testing. Since we are using digital transmission and the picture is either there or not there, the receiver can lock on as a still picture. I built a test generator using a PIC with scrolling ident and using the program called Monoset (V1.2) to change the scrolling text and callsign. Also, by use

of the push buttons, the callsign and clock can be alternatively switched. The encoder uses the Motorola MC1377 because I had one; however, future designs would use the AD722 as this has inbuilt filters. Also, it would have been nice if the line and sub-carrier relationship could have been locked. I found this more annoying than when viewing it in analog. Likewise, the Cropedy, or the newer version from G3RFL, can be made to switch several cards in an animation sequence.

One of the problems now encountered is the use of the computer to download required changes. Maybe a small microprocessor for control of minor functions with readout would be nice. While advocating the use of the computer around the shack for ATV activities, we now have to control DATV transmitters, Character Generators, OSD units, switchers, etc. How can we now control all these devices from the one computer?

I would like to take this opportunity to thank Stefan Reimann from SR-Systems, Arthur Lambriex EA5FIN and Rob Krijsman PE1CHY for their valued help and understanding during this period.

References

1. www.datv-agaf.de/
2. www.digitaaltv.com/
3. www.ping.be/ea5fin/datv.shtml
4. www.qsl.net/pe1chy/DATV1.htm
5. lea.hamradio.si/~s51kq/S5-DATV.HTM
6. www.sr-systems.de/de/index.htm
7. users.skynet.be/ea5fin/usermanual.htm
8. www.qsl.net/pe1chy/PI6ATR.htm
9. www.d-atv.com
10. www.atvrepeater.com
11. www.minikits.com.au
12. Digital ATV tests with GB3ZZ – CQTV 200
13. 70cm Digital ATV in Practice – CQTV 200
14. http://f5ad.free.fr/ATV-QSP_F5AD_MireCouleur_16F84_1377.htm

(Part two of this article will appear in *Amateur Radio* December issue)

All HF bands in one antenna installation

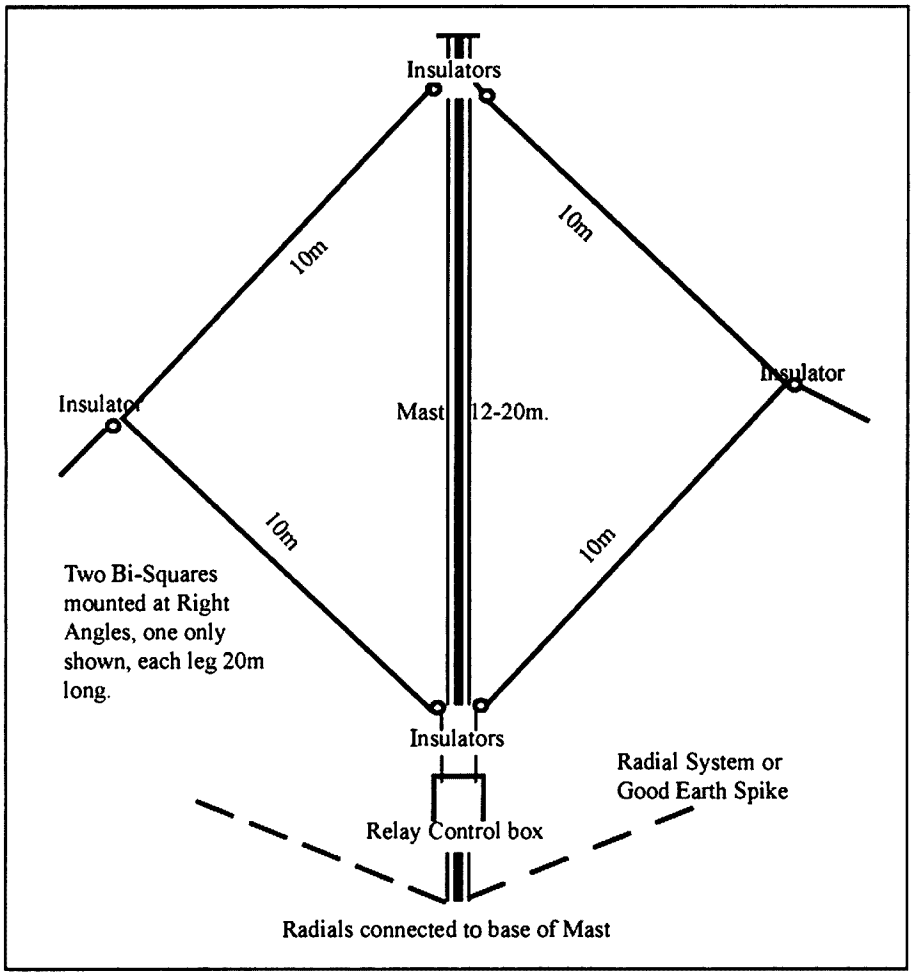
Don Haberecht VK2RS

In moving to a new QTH the writer was faced with the erection of a new antenna. It needed to be simple and easy to erect, preferably from a single mast or tower, needed to show gain and directivity on all HF Bands, and require minimal service attention.

A trial antenna was suspended from a 12 metre mast which worked very well on all bands except 160 and 80 metres. As much of my earlier DX activities had been restricted to these bands, because of a poor alpine location which limited the higher frequency bands, it was considered important that the design would, in fact, be an effective antenna on 160 and 80 metre DX. If the lower bands of 160 and 80 metres are not required then try a height of 12 metres or so and you will be pleasantly surprised.

Remembering early days, when rotary systems were few and far between, a Bi-square provided good gain, around 6-8 dB on the 20 metre design frequency and is bi-directional with a low radiation angle. Also, the lobe in both directions is quite broad on 40, 30 and 20 metres, sharpening on bands 17 to 10 metres, but still provides worthwhile gain and directivity.

An antenna tuner is necessary for multi-band operation. Radiation on 160 and 80 metres is vertically polarized, and horizontal on the higher frequencies when fed at the bottom of each Bi-square.



Practical construction

Two Bi-squares are used at right angles to each other, both fed at the bottom with all four legs open at the top. Each leg is 20 metres long and suspended from a 20 metre tower. At the centre point of each leg an insulator is attached allowing a tie point to pull out the leg to an angle of greater than 60 degrees. The true angle will depend on the location and desired height of the lower termination (feedpoint - about 3 metres in my case). It will now be quite obvious that the antenna itself helps to support the mast. The original test antenna had a reduced angle because of the lower pole height (12 metres). This worked very well on all the HF bands, except 160 and 80 metres with the base feedpoint about 2 metres above ground.

In theory, the stacking of two half wave antennas lowers the angle of radiation and provides a balance less reliant on height above ground, or an effective height equal to the midpoint height between the two half waves. The same theory applies to this antenna. It is important that the two Bi-squares are electrically identical in order that, when switching from one to the other, the impedance remains almost the same on each antennae for all bands. Adding a short length to the antenna which is high in frequency by trial will offset any major differences.

The original design included four double-pole relays mounted below the feedpoints in a waterproof box via equal length sections of open wire line, which made it convenient to adjust the length to match each antenna.

In the relay rest position the four legs were grounded for safety sake, or alternatively connected to a fifth relay which, when activated, selected the four legs together to form a four wire Umbrella Vertical tuned at the base

for 160 and 80 metres with a separate pi-coupler for 160 metres (see Amateur Radio, April 2005, page 14 for Drew Diamond's fine example). On 80 metres connect directly to the co-axial line at the control box by way of another relay On both 160 and 80 metres the ground system or earth spike becomes the return..

On the higher bands above 80 metres, when the leg relays were individually activated, it was possible to select any pair combination of the four legs and thus control the radiation direction with an improved front to back ratio. After four years of use it was found that the four compass directions were adequately covered, both short and long path, on all HF bands by the selection of one antenna or the other, thus simplifying switching. In the final outcome the switching is now done within the shack by feeding each antenna with identical lengths of open wire line to the aerial coupler via a double-pole heavy duty wafer switch.

For 160 and 80 metres the four legs of the open wire feed line are now bridged by two double-pole relays (within the shack) and fed to the antenna tuner. A good radial system below the antenna will improve the performance magically on both 160 and 80 metres - ideally four or more quarter wave radials buried beneath the ground.

In both 160 and 80 metre operation each antenna leg will carry equal current so the resistive losses will be reduced thus improving the radiation efficiency with a low angle of radiation.

Conclusion

The flexibility of the earlier system utilising relays at the base of the antenna allowed for better combinations, particularly on 20 metres and above where, by appropriate leg selection, there was increased forward gain and improved front to back ratio. In practice it was found that the simple selection of either Bi-square was the most reliable option and certainly the least confusing.

Final notes

It is wise to respect correct phasing. Ensure both right hand legs of either antenna are connected to corresponding antenna tuner input via the relays.

Both Bi-squares should be near symmetrical in shape. The actual shape may be determined by the proximity of objects. It may be that a triangular configuration suits your location better, or perhaps you may need to reduce the physical size of each square and this can be done by inserting stubs at each of the two tie off points (towards the mast). Whilst this is a compromise, the basic fundamentals of stacking and low angle are still maintained.

Over an active period spanning more than 50 years the writer has experimented with a multitude of wire antennae for single band and multi-band operation. This system provides a convenient option for multi-band operation with a single mast mount that is quite unobtrusive, usually an important consideration within the household. Don't forget to put your VHF antenna on top of the mast ..... have fun.

ar

Instant gratification

Bill Isdale VK4TWI

When we look at one of the recently designed radios on the market today we see a wonderful product of micro-electronic engineering. Many if not most of the components are surface-mounted devices, put in place by machines and soldered by a wave of molten solder, flowing over a circuit board in an oxygen-free environment. No uncertainty has been introduced by a human hand, which might be carrying some smudge of oil or some dust or simply tremble a bit. The automation of manufacturing has vastly increased the capability to deliver consistent quality and to shrink the size of components while placing them closer together, reducing unwanted losses and, for instance, stray capacitances between them.

The designers have, typically, produced a transceiver which will operate on the amateur bands from 160 m to 70 cm and will transmit up to 100 watts into a designated load of 50 ohms. What is delivered to us is a modern engineering marvel, which performs brilliantly and is very compact and inexpensive relative to its capabilities.

We could, just to show that we are capable, build our own radios, but the realities of what can be manufactured in even a well-equipped amateur's workshop would limit many of us to a simple device of modest capabilities. But where we can shine is in exploiting the capabilities of the radio we have bought.

The radio usually comes to us ready to power up and operate. Power supplies can be built or bought to deliver what is needed, usually 12 volts or a little more of ripple-free direct current. We don't want wobbly input power upsetting the radio; the only oscillations we want are the ones that are put there deliberately to produce the radio frequency output. The critical part of our emerging radio station is often going to be what comes after the output connectors of the transceiver. To operate we must radiate and to do that we need a feed line and an antenna. This is where we have an opportunity to really excel.

The options are many in theory but may be substantially limited in practice. The best place for an antenna will be high above electrically-conductive and therefore radio-reflective ground. Those who live in a salt marsh on top of a mountain will have major natural advantages. Living by the sea will also be advantageous. Otherwise we must simply do the best that our location allows.

Height is important, to get clear of the interference of objects such as houses and to allow the radio waves to begin propagating in open space. There will be a significant loss to our signal if it is absorbed by, for instance, our house which is full of pipes and wires. Some people may find that the solution for them is to erect a tower which takes their antenna array up into clear space. There will be considerable expense involved with this and, I am bound to say, for some reason not everyone thinks towers are pleasing to look at. There are other options for putting up an antenna, among them using a skyhook in the form of a tree or perhaps a patriotic flagpole or simply a strong, light and cheap bamboo pole.

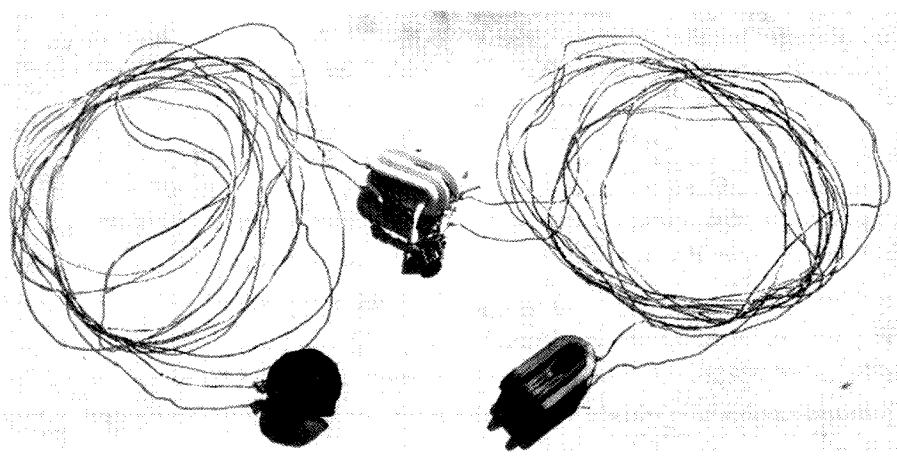


Photo 1 – The dipole rolled up and ready for transporting.

An antenna can be a well-engineered commercial model or we can achieve a lot for a small outlay of cash by building our own. The ideal antenna would be compact, light, durable and inexpensive, and would radiate efficiently from say 160 m to 70 cm. Anyone waiting to read how to build such a desirable antenna will have to wait a little longer because I don't know. I suspect that when someone works this out the word will travel very fast. For the present, I am going to look at how to achieve quite a lot for a little.

Many antenna designs of great elegance are available to achieve multi-band performance. Naturally enough they represent a number of compromises, sometimes requiring an antenna tuner to modify their input impedance to present a 50 ohm, purely resistive load to the radio. Radios are designed to operate into that particular standard load and their performance will degrade if they are not operated as specified.

What I am going to propose is how to get on the air quickly and inexpensively with good results. In order to do this it will be necessary to accept that no single antenna will provide good results across all the bands that our radio can handle. It is best to choose the band(s) where we want to operate and provide an antenna which does well there. It is much more achievable to design and build an antenna which performs well on one band than to try to make something operate on a number of different bands. The laws of physics simply cannot be broken.

At present, the sun is becoming

relatively quiet as it approaches the low point in its 11 year cycle of sunspot activity. A quieter sun means less ionisation of the upper atmosphere and less reflectivity to high frequency radio waves. However, we do know that the 20 m band provides the best overall reliability for long distance communication and will work quite well at present. If we build an antenna for 20 m then we will be able to expect some good results. The part of the 20 m band used for single side band voice communication is around 14.2 MHz so an antenna designed to work there will get us to where there will be active operators.

Putting up an antenna which is resonant at the desired frequency will produce a high return for our efforts. Resonance is easily achieved; we simply build an antenna of the right size. The reward is that it reacts to signals of that frequency very strongly, giving good performance both radiating and receiving. There is no need for an antenna tuner to mimic for the transmitter the load it was designed to operate into; and no loss in the antenna tuner itself. An antenna tuner, after all, despite its name, does not tune the antenna. Why would we think that, just because of its name? What it actually does is allow an antenna to be used outside the frequency range at which it is resonant. It does this by adding inductance and/or capacitance so that the impedance presented to the radio approximates a 50 ohm resistive load, into which the radio was designed to operate. The result is to make it possible to use the wrong antenna, not to make that antenna the correct size for its task.

The wavelength we wish to radiate and receive will determine the size of the antenna. A convenient formula to find the wavelength is to divide the radiation velocity (300 megametres/second) by the frequency in MHz. In this case, we have 300 / 14.2 = 21.13 metres. Divide this by 2 because we are designing a half-wave antenna, then multiply by 0.96 to allow for the reduced velocity of energy flowing in the radiating element. So the antenna length will be

$$\frac{21.13}{2} \times 0.96 = 10.14 \text{ metres.}$$

Copper wire is used as it is an excellent conductor. Gold is better but too soft and just a little expensive.

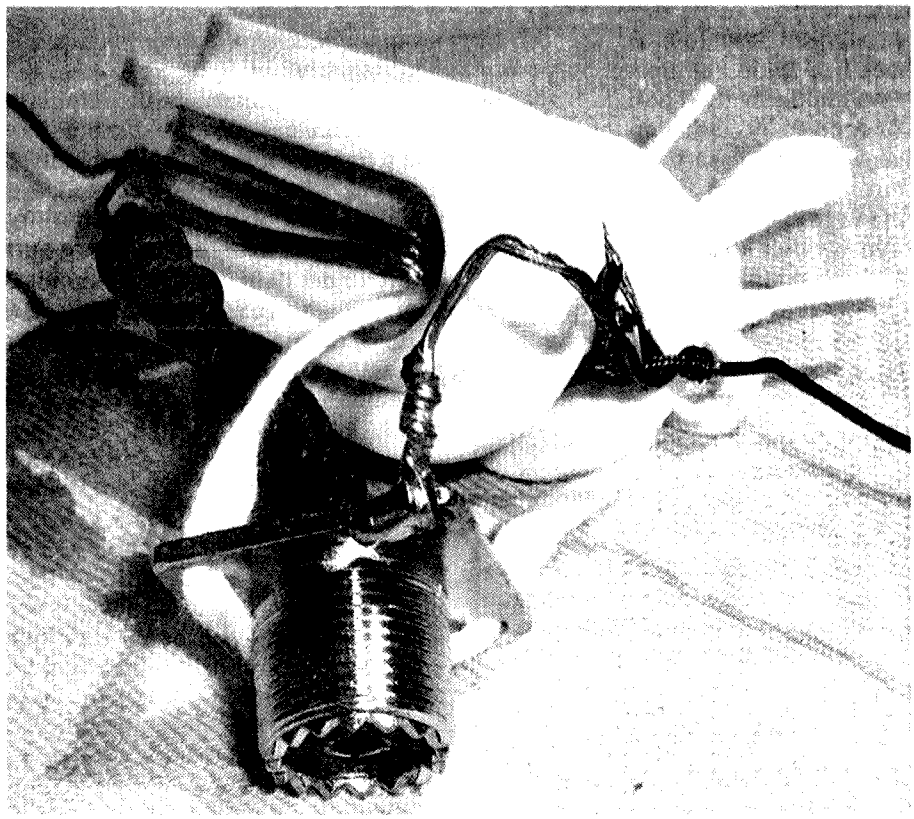


Photo 2 – An inexpensive connection between the dipole and the coaxial feeder.

The antenna design I am suggesting is a dipole so each side of the dipole will be 5.07 m long. Resonance is achieved from the quarter wave elements. The dipole, if in clear space for half a wavelength around it, will present a 72 ohm resistive input impedance. This isn't perfect but it is very good. It will, if connected to our transmitter, not radiate perfectly but will present standing waves, voltage peaks and troughs, along the feed line from the transmitter. This is not a problem so long as the situation is minimised. The ratio of the standing waves, the SWR, can be calculated from 72 divided by 50, which is 1.44. Such a SWR is not a problem and the transmitter will be able to work well with it. Do not be tempted to adjust the length of the radiating elements to try to improve the SWR, it cannot be better than 1.44 due to the nature of the antenna, and that is a good figure.

The energy surging into the antenna, at the radio frequency it is designed for, will produce a surrounding field. This field, in view of the size of the antenna which it has to occupy, just does not have time to collapse back into the antenna again when the oscillation is on its down-swing. It is still in space around the antenna when the next surge comes in and, since like polarities repel, it is pushed away from the antenna, off to see the world at the speed of light.

We must of course get the energy from the transmitter to the dipole. The ladder-type line works a treat, with very little loss. For many people, however, the co-axial line is more convenient. Ladder line is inherently balanced; the fields around the two conductors are complementary and do not radiate. Radiation does take place when, in effect, the two conductors are peeled apart to make the dipole. The two fields cannot reach each other to remain in balance and so are radiated. With co-axial cable, the two conductors are inherently in an unbalanced situation, one inside the other with insulation between them. There may be a tendency for energy to leak back along the shielding braid of the cable instead of being radiated by the antenna as planned. The transmission line then becomes an unintended part of the antenna and will mess up our calculations. Fortunately this is easily cured.

The radio frequency energy can be prevented from escaping down the shield of the co-axial cable by adding an inductance which will oppose it. A balun, a balanced to unbalanced transformer, will keep the balanced

antenna from being degraded by the unbalanced feed line. Baluns can be bought or made. For present purposes a simple and effective choke balun can be constructed by coiling up the cable just below where it feeds the antenna. About four turns to form a circle around 200 mm in diameter will choke off the flow of energy back along the cable shielding. The coil can be maintained in shape with, for instance, some small cable ties, the black ones which can survive outside fairly well.

For a big improvement in simplicity and performance, we can exploit the fact that a transmission line will present, at its input, exactly the same impedance which it sees at its output when its length happens to be half the wavelength of the signal it is carrying. It may not be possible to build to this length and still join your operating position to the antenna location but if it can be done it is a simple and effective way to match the radio to its feed line. For our antenna, the half wave length is 10.14 m. Bearing in mind that co-axial cable, because of its design, has a velocity factor of, commonly, 0.66, it is necessary to find 0.66 of 10.14 m , which is 6.69 m. A feed line of that length will not add any complexity of its own but will simply allow the transmitter to "see" the 72 ohms at the antenna feed-point. This will produce a 1.44 SWR and work very well. There is no need for an antenna tuner and a simple and effective resonant antenna system has been achieved.

The radiation pattern of a dipole can be imagined as a doughnut shape with the wire running through the hole in the middle. This makes it directional in that it works best to its sides, and not well off its ends. This can be taken into account in positioning it.

A key construction element is the join between the dipole and the co-axial line. An inexpensive connector such as the panel socket square mount SO 239 costs under $3 and will allow the two sides of the dipole to be joined to it, one to its centre pin and the other to one of its holes meant to take mounting screws (see photo 2). The gauge of the wire for the dipole can be what will solder easily to the connector and is as large as convenient so it has some strength. Each outer end of the dipole can be wrapped onto a plastic insulator such as is available inexpensively, usually in packages of more than we really need, at produce shops which sell them for use in electric stock fences. An insulator can be placed in the centre to take the strain of each side of the dipole and the wires can then be taken down to the connector so that the soldered joints take no strain. The weight of the co-axial cable, hanging vertically below, can also be taken by some insulating cord (a nylon shoe-lace works well; again see photo 2) that passes through the spare holes in the connector and ties onto the central insulator. Some self-amalgamating tape can be used to try to keep rain out of the connector.

The measurements of each side of the dipole can be taken from the join at the connector to the furthest point out on the ends, using a tape measure. Disregard the fact that the wire is twisted up in places for mechanical reasons; it is the overall length of the wire as you are looking at it that counts. Joining the dipole wire to the insulators can be done simply by twisting it a few times. When cutting the dipole you can leave about 300 mm extra on both of the lengths of wire so that you have plenty to work with when building. You can wrap the wire on the insulator until the overall length of exposed wire is the correct length and then trim off any excess. It does not matter for practical purposes that the length is partly achieved by a twisted bit of wire.

An option for maximum simplicity would be to discard the outer end insulators. The outboard ends of wire can be twisted and perhaps soldered into a small loop, the overall length of the wire being the desired one. The dipole can then be suspended from these loops by some suitable plastic cord, which provides the necessary insulation to the high voltage present on the end of the wires.

When hanging the antenna, it will be found to work best if kept clear of objects as far as possible and put up as high as possible, oriented so that its radiation pattern is in the direction you want to exploit. This will be so that the side of the wire is in the desired direction.

Remember to think of safety and the requirements to minimise radio frequency energy around people. Any antenna should be disconnected when not in use to avoid the danger of a lightning strike destroying the radio.

The antenna is suitable for carrying rolled up (see photo 1) in a small bag and is useful for quickly getting on the air wherever you happen to be.

ar

Making shunts for ammeters

Draw Diamond VK3XU
Photos: Andrew Diamond

When planning a dc power supply, or maybe a linear amplifier project, it is often found that an ammeter of the required range is not available, and so a more popular meter must be adapted for the job. Some common sensitivities are 50, 100, 250, 500 pA and 1 mA full-scale deflection (fsd), whereas, we may need a meter to measure perhaps 1, 5, 10, even 25 Adc. The usual solution is to "shunt" the meter's coil with a parallel resistance of appropriate value (Refs. 1 and 2).

Unfortunately, recent amateur literature (eg Refs 1, 2, 3 and 4) has routinely suggested copper or nichrome wire as the shunt material, both of which are far less than ideal for this application. Certainly, copper wire is cheap, plentiful and solderable, but, due to the heating effect of larger current values, the high positive temperature coefficient* *(see note at end of article)* of copper makes it quite unsuitable for accurate measurements.

Nichrome (an alloy of nickel and chrome) has a very low temperature coefficient, is readily available from electronics suppliers, also being salvageable from defunct electrical appliances such as heaters and hair dryers. However, without special equipment, it is very difficult to soft-solder. And a crimped or wire-wrap type connection (of the shunt wire) may well not hold its resistance value over time.

The most ideal material is probably manganin wire. Being a correctly proportioned alloy of copper, manganese and nickel, it has an extremely low temperature coefficient and solders beautifully. Sadly, it is not readily available in small quantities from the usual electronics suppliers.

Fortunately, Dick Smith Electronics sell "Cuprothal" resistance wire, supplied as 4 metres of # 28 B&S (Item number W - 3200, no longer listed in their catalogue, but known to be still generally available). Cuprothal (a trade name) is an alloy of copper and nickel, has very low temperature coefficient of resistance, and solders well, which makes it quite suitable for use in making ammeter shunts.

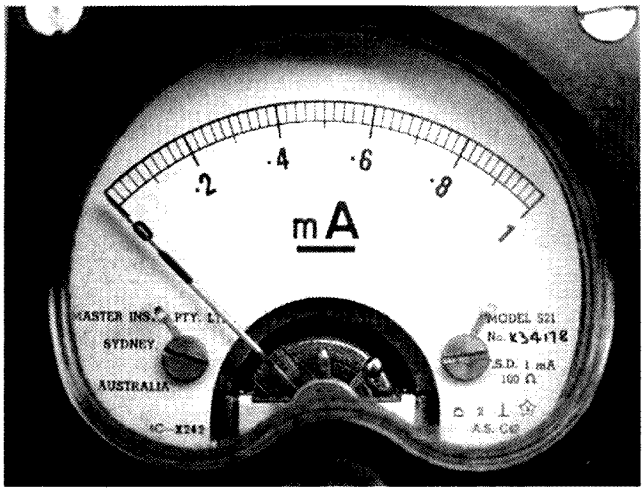


Photo 1 - Typical meter face bearing relevant information.

Finding the resistance of a meter

In order to make a shunt, we need to know two things; the resistance of the meter's coil, and its basic fsd sensitivity. Many of the better class meters have the

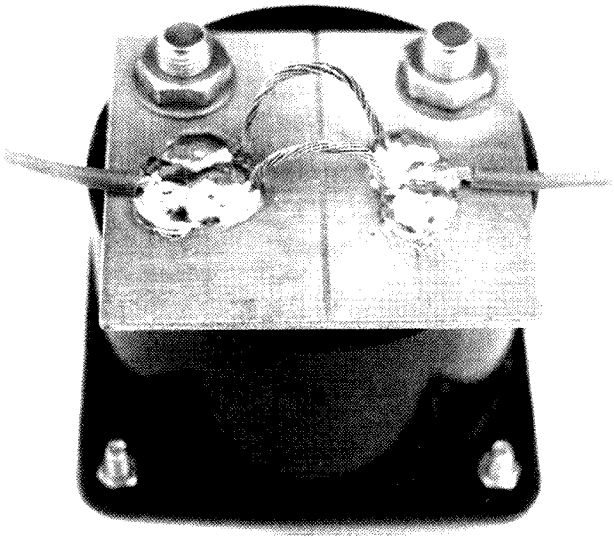


Photo 2 - 10 A shunt.

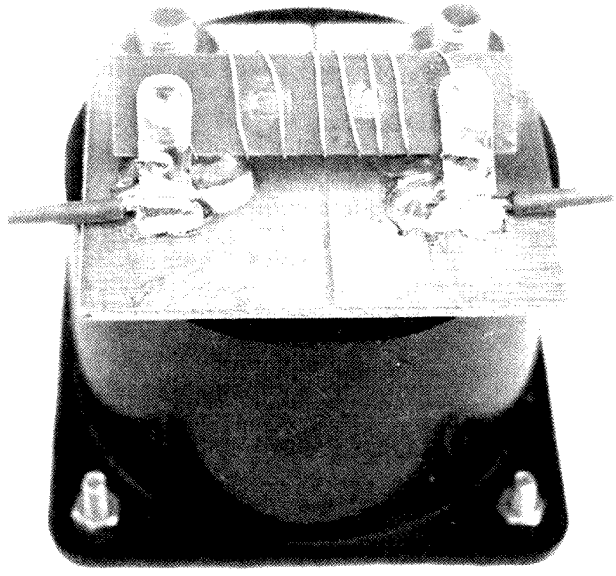


Photo 3 - 100 mA shunt.

resistance and other information marked upon the lower area of the meter's face (Photo 1). In such cases it is not usually necessary to actually measure the resistance of the coil.

Before any work is done, it would be sensible to check that the meter is indeed serviceable. A variable dc power supply is an ideal voltage source for such tests. The Meter Under Test (MUT) is configured first as a simple dc voltmeter, as shown in Fig 1. Calculate the value of resistance needed to allow a current equal to the meter's fsd to flow from (say) a 12 Vdc supply. For example, a 1 mA meter will need a series resistance (ignoring the meter's resistance for now) of:

$$R = \frac{E}{I} = \frac{12}{0.001} = 12{,}000\ \Omega.$$

(Abbreviated to 12kΩ)

The meter may be hooked up to the 12 Vdc supply with a 12 k "multiplier" resistor in series. A reading of something close to fsd should be obtained. If possible, slowly vary the supply voltage down towards zero, then back up again, and observe that the meter's needle moves smoothly, with no sign of stickiness.

If the coil resistance is unknown, configure the meter as for the test described above, but with the addition of a series Test Multimeter (TM), set to measure a current value inclusive of the fsd of the meter under test (see Fig 2).

Adjust the dc supply voltage so that the unknown meter reads fsd, whereupon the series multimeter shall indicate the actual value of current flowing, and thus verify the basic sensitivity of the meter.

Using a sensitive Digital MultiMeter (DMM), carefully measure the dc voltage drop Em across the meter's coil. For my 1 mA (0.001 A) meter in this example, the drop is found to be 0.1 Vdc:

$$Rm = \frac{Em}{Im} = \frac{0.1}{0.001} = 100$$

thus confirming that the coil resistance is indeed 100 ohms.

Calculating Shunt Resistance

It is interesting to derive a suitable formula from Ohms Law. Since the shunt is in parallel with the coil, the same voltage E appears across each. Therefore

E = Im x Rm = Is x Rs

where Im is the current through the meter's coil, Rm is the coil resistance, Is is the current through the shunt, and Rs is the resistance of the shunt. Since

Im x Rm = Is x Rs

then by re-arranging for Rs as the unknown, we find that

$$Rs = \frac{(Im \times Rm)}{Is}$$

We want to know the value of resistance necessary to "shunt" the bulk of the current to be measured around the coil, and so, to be exact, for a measured current of I, Is will be (I - Im). The precise formula is therefore

$$Rs = \frac{Im \times Rm}{I - Im}$$

An often quoted formula, derived directly from the previous formula is

$$Rs = \frac{Rm}{(N-1)} \quad \text{...(Refs 1and 2)}$$

where N is the ratio I : Im (in the same units).

However, in most practical instances, where the coil current is over 100 times smaller than the shunt current, (I - Im) can be taken to be simply I.

So our simplified formula becomes

$$Rs = \frac{Im \times Rm}{I}$$

As a first example, let's suppose we need to shunt my meter to read 100 mA (0.1 A) fsd.

Substituting;

$$Rs = \frac{0.001 \times 100}{0.1} = 1.0\ \Omega$$

Where the ohms per metre of the wire is known; length of wire needed to obtain a certain resistance is

(l)ength mm = (1000 x Rs)/ohms per metre

Resistance of the wire is 6 ohms per metre. We need 1.0 ohm. Therefore

$$l\ \text{mm} = \frac{1000 \times 1}{6} = 167\ \text{mm}.$$

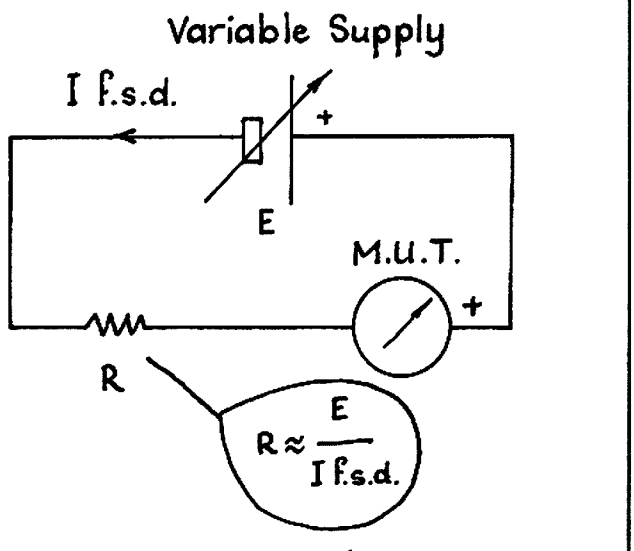


Fig. 1

Check Meter f.s.d. Sensitivity.

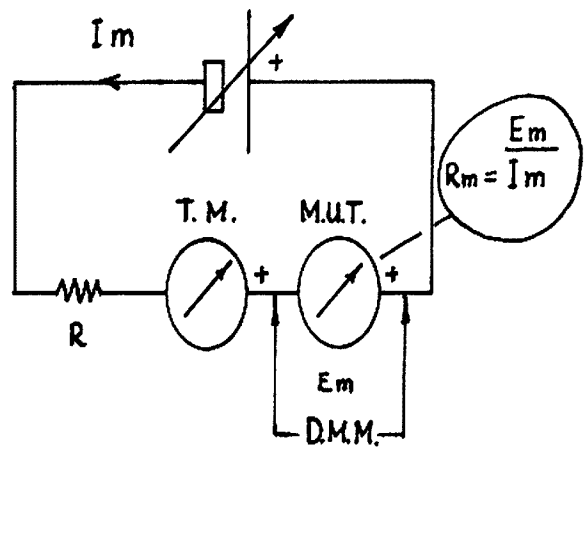


Fig. 2

Determine Meter Coil Resistance.

Making a shunt

We should use some kind of former to accommodate the shunt wire. As the wire is not coated, the turns must be space wound so that they cannot move or short together. Photo 2 illustrates a suggested method using a length of tag strip. Two tags have been removed from the strip, which allows 167 mm (plus terminating tails) of shunt resistance wire to be wound on.

The shunt may then be soldered upon a suitably sized and drilled rectangle of single-sided printed circuit board which in turn is mounted onto the meter's rear terminals as shown. Note the single shallow hack-saw cut along the centre of the board.

Care must be taken so that no "spurious" extra resistance becomes included with the shunt resistance. Therefore, when the meter and shunt are wired into circuit, it is important that the connecting wires be soldered right at the shunt connections, as illustrated in Photo 2.

Accuracy of the meter and shunt may be tested in the set-up shown in Fig. 3. Variable power supply and/or series resistor R are adjusted for fsd, whereupon the two meters should closely agree.

In the next example, let's look at shunting the same 1 mA meter to read 10 A fsd.

By experiment it is found that the #28 B&S Cuprothal wire fuses at about 7 A, but is easily capable of carrying 1 A without significant heating. I want the shunt to carry 10 A, so I shall use 10 parallel strands for the job.

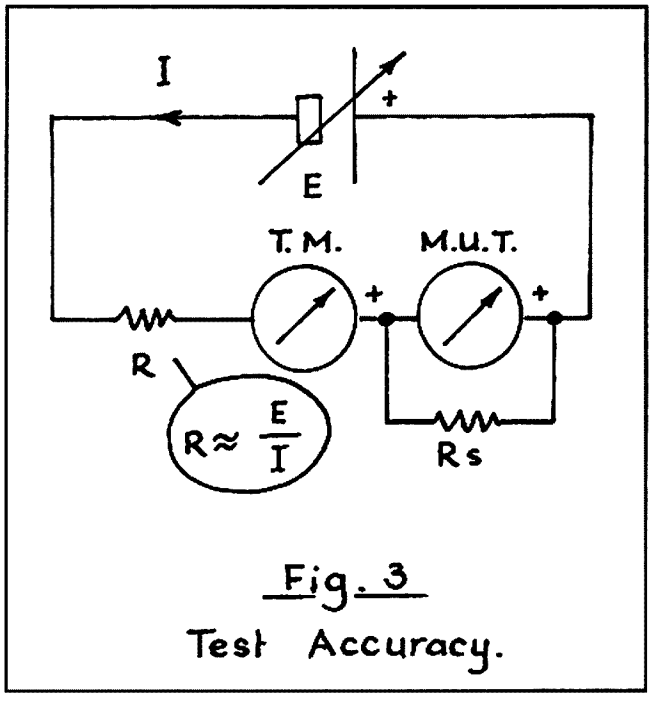


Fig. 3
Test Accuracy.

The shunt resistance needs to be;
Rs = .001 x 100/10 = 0.01 Ω

However, since 10 strands of wire are to be used, each strand shall carry 1 A, so we simply calculate as for a 1 A shunt;
Rs = .001 x 100/1 = 0.1 Ω

Actual length of each shunt wire is

continued on page 38

News from...

VK2

Tim VK2ZTM

Quite a bit of activity this month. The equipment tender for members of AR-NSW will close on Friday the 11th. Check the web site at www.arnsw.org.au Equipment will be available for collection by those successful at the November - Trash and Treasure - that will be held at VK2WI - Dural. The only controlling factor will be the weather. If it is doubtful, VK2WI will advise at 10 am - Sunday 27th - and the event may be reverted to Parramatta.

This month on Saturday the 19th. the club conference with the WIA and AR-NSW is scheduled to be held at Amateur Radio House - Parramatta. On Sunday, the 13th, Westlakes have their field day.

By now, the office hours at Parramatta may have been reduced to a couple of days a week. The VK2WI news sessions will advise the days for each week. If you are coming from some distance, you should always check ahead to see if the office is attended - telephone 02 9689 2417. The VK2 Bookshop activities will become a function of the National WIA. There is some stock left as these notes were prepared, which may be only be purchased by personal office sales.

WICEN [NSW] Inc, in a news item early October, reminded current and old members that the State Government was planning legislation to make it an offence to wear uniforms of or display insignias of emergency services, if one is not authorised to do so. As WICEN is a member squad of the VRA, it would appear that they are covered by this intended move. In other words, those former members of WICEN, including unfinancial members, would not be able to just slap their old signs on their cars and go swanning through a road-block, so perhaps they could consider re-joining WICEN instead.

The automatic morse transmission from VK2WI on 3699 kHz is going well on its new keyer. Some additional text is being planned, which will include some examples of how an 'on air contact' is conducted, including the short hand and abbreviations. This is an invitation for those who make CW contacts to provide examples of such contacts. We are looking for script of DX contacts, contest working and general rag chewing. If you would like to provide such examples, you can e-mail them to vk2wi@ozemail.com.au , identify them as 'Morse examples' or by mail to P. O. Box 9423 Harris Park NSW 2150.

For those who prefer live Morse training, you can find the service provided by several Amateurs on 80 metres under the call VK2BWI. They are there several evenings per week at 2000 hours VK2 time - conditions permitting. If you would like to assist with this service, contact Ross VK2ER who has the slot of Thursday. The method of operation is to come up on voice, introduce the next piece of text and then send the Morse. At the end of the piece, there is a read back. Operating tips are also given. Callbacks are also taken and you are invited to call in, if possible. There are also several clubs and individuals that provide either on air or classroom training. Please advise so that we can give your efforts publicity.

As the solar conditions head for the bottom of the present cycle, it has been making HF coverage by VK2WI difficult. On a couple of occasions, the HF portion of a morning session was washed out. On one occasion there was a replay of the session made on the following Tuesday evening. This approach may be taken on future occasions, when practical. VK2WI news is a real time production, so it is currently proving difficult to provide reliable signals to the relay stations operating beyond the linked repeaters. We thank those relay stations for the effort they go to trying to retrieve an HF signal. VK2WI is looking for more Announcers and Engineers to join the team; the numbers are down a bit at the moment. Pat VK2JPA has retired from the evening roster after many years of involvement. Many thanks to Pat for her efforts. Get in touch with John VK2JJX or the Parramatta office if you can assist.

Many clubs make use of the VK2WI news facilities to promote their club activities. We invite others to also use the service to advise their activities. We would like all clubs to let us know their meeting dates for 2006, so they can be included in the 'coming events'. Send your items, early in the week, via e-mail to vk2wi@ozemail.com.au or postal to P.O. Box 9432, Harris Park, 2150.

73 for this month de Tim VK2ZTM.

The Central Coast Field Day 2006 adds YLs' section

19th February 2006

This year the Central Coast Field Day Committee is trying something a little different. This year there is to be a section of the Field Day allocated to the ladies.

Hi, my name is Maeva Bennett, VK2HUG, and I am the co-ordinator for the Ladies' Section of the Field Day. My aim is to try to find things of interest to attract women to the Field Day by organising a Craft Show incorporating demonstrations, workshops, displays and retailers of craft supplies.

We have been allocated the top (air conditioned) floor of the Racecourse building to hold our Craft Show, and I hope to organise about 4 workshops to be rum over a period of about 11/2 hours - these workshops will include Bead Jewellery Making, Quilting for Beginners, Rag Doll Face-making, sculpting and painting and another to be decided. The cost of the workshops is free but you will have to purchase a "kit" at cost price so that at the end of the workshop, you will have not only learnt something new but you will have done hands on practice and have your item to take home as an example for later examination. The number of participants in each workshop will be limited to allow for individual assistance

and to give the ultimate in your learning experience of each of the crafts.

I am approaching various retailers to participate in the day, by making available their stock of craft supplies for sale on the day as well as presenting demonstrations of the latest gadgets, techniques and materials available to those who enjoy their crafts.

There will also be a display of the Crafts that we crafty ALARA members and XYL's do, while not on the radio or making cups of tea for the male members of our family. If you would like any of your work displayed please contact me at any time, remember it's the Ladies Field Day and it's our chance to get involved in our hobbies and interests.

If you would like to participate in the workshops, have any ideas of what you would like to see or do, would like to present a workshop or display your creations, please contact me.

It's up to us to make it a success, and I have noticed over the past years that we ladies are a crafty bunch, let's get the best out of the day for all of us – radio and craft – the best of all worlds.

Maava Bennett VK2HUG
Internet: vk2aal@comcen.com.au
Phone: 0242 976065
Radio Coast Lind Repeater 146.850, IRLP Node 6018

VK5

Adelaide Hills Amateur Radio Society

Christine Taylor VK5CTY

Unfortunately the talk on satellite communication had to be delayed but members were entertained by a talk given by Jim VK5NB based on his experiences with towers when he worked for the old PMG.

There were photos to illustrate different types of towers and even some that showed the damage caused by storms or (occasionally) faulty design.

The new venue for the meetings seems to be working quite well and no one has got lost, so far.

If you are visiting VK5 please come along to a meeting on the third Thursday of the month (except for July and Dec – and maybe January). Contact President Jim VK5NB or Secretary Leith VK5QH QTH the Callbook for information.

If you would like to hear one of the lectures mentioned in this column you may be able to borrow a video of it. Greg VK5ZBD videos each lecture for us so we have quite an interesting collection, now. As AHARS is a large club it is easier to attract lecturers than is possible for the smaller clubs. The cost of borrowing is minimal. Contact either Jim or Leith for details

VK6

Operation of VK6WIA in RD Contest.

Right: Mal Johnstone VK6LC operating VK6WIA at his aerial farm at Crossman WA.

Below: The VK6LC aerials at dusk

News from...

VK7

Justin Gilae-Clark, VK7TW
Email: vk7tw@wia.org.au
Regional Web Site: reast.aan.au

2005 Sewing Circle BBQ

By the time you read this, many would have had a great time at the Sewing Circle B.B.Q. Ken, VK7DY and family hosted the event at their property at Orielton - 30 kms east of Hobart on November 6. This is an annual event, which attracts many VK7 and interstate visitors. It is a field day BBQ and most importantly the day that the Sewing Machine Award is presented to the operator most worthy of this prestigious award!

VK7 EME DXpedition

Rex, VK7MO spent a couple of weeks on Cocos-Keeling and Christmas Islands in the Indian Ocean using 2 metres and 70 cm and the digital mode JT65 included in Joe Taylor's (K1JT) WSJT program for moon bounce (EME) operation. Rex made 156 contacts on 2 metres and 8 contacts on 70 cms from these rare DXCC locations. Congratulations Rex on this unique DXpedition.

IOTA DXpedition

VK7FLI was active on OC195, Flinders Island from 19-23 October on 80, 40 and 20 m. QSL cards can be sent via Allan, VK7AN or Barry, VK7BE.

VK7 BPL trial starts

The Aurora Energy trial is being watched very closely with many measurements being taken and interference levels being closely monitored. There have been many letters to the editor appearing in Tasmanian newspapers and a feature on the ABC Tasmania Stateline program. Phil Wait, VK2DKN, Phil Thompson, VK7SS and yours truly have also met with the State Energy Minister Brian Green MHA to express our concern at the technology. There are many outrageous claims being made about the amateur service so, we encourage all amateurs and interested people to take a look at the REAST website and familiarize yourself with BPL technology, what it sounds like on the air, what it looks like on the poles and if you are experiencing interference that you believe is BPL then make a complaint to Aurora Energy and ACMA as per the ACMA guidelines.

North West Tasmania Amateur Radio Interest Group

Planning is underway for the centenary celebration of the first Marconi Radio Transmission across Bass Strait. Devonport to Queenscliff in Victoria in July 1906. NWTARIG in conjunction with the Devonport City Council and the Geelong Amateur Radio Club and various shires and public utilities in the Queenscliff and Geelong areas will be involved.

The North West now has it's own IRLP Node thanks to Tony, VK7AX. Node Number 6124 is linked to the 2 metre repeater VK7RNW at Lonah. Facilities include broadcast file replays, voicemail, weather reports and time checks. EchoIRLP facilities are also anticipated.

Shirley VK7HSC is a regular participant in the IRLP YL Friendship net which takes place on the first and third Sundays using reflector 9258 at 0800 local (EDST). There have been over 26 stations and 7 countries involved. OMs are most welcome, so feel free to join us, Shirley reports.

Northern Tasmanian Amateur Radio Club

The October meeting was a dinner meeting with partners and the guest speaker was Mr Tony Hart from Centrelink. Tony presented some very useful information for those nearing or contemplating retirement. Tony also answered many questions about what you can and can't do with those dollars you've been siphoning away! A most enjoyable night.

Radio and Electronics Association of Southern Tasmania Inc.

Roger, VK7XRN reminds us of a significant REAST milestone, our 75th member, welcome aboard, Myles VK7MF. Socially we are going well. You only have to visit the clubrooms for the Wednesday lunchtime gatherings to gain an appreciation of that dimension. Visits are well attended. Small special interest groups are very active too. Repeaters, computers, homebrew, ATV, WLAN, just to name a few!

Reg, VK7KK has returned from a 2 day training seminar in Sydney and is chaffing at the bit to get going with assessing the Foundation Licence and the new Amateur Syllabi.

Repeater 2 (146.7 MHz) is now being tested from the Domain and the 70 cm output remains on air at Guy Fawkes via the old R2 receiver and antenna. Reports so far about the new locations' coverage are good and the picture is building. Brian, VK7BW has graciously lent us the use of his WICEN R15 repeater for the new Snug Tiers site and this is on test, transmitting on 147.950 and receiving on 146.150 MHz with a 151.4 Hz access tone.

Our October visit was to the Communications and Major Incidents rooms at Tasmania Police in Hobart. Thanks to Duty Sergeant Pat Lee and Inspector David Chambers for organising this fascinating tour. I think many people came away from the tour with increased respect for the police communications operators who each handle something like 200-300 calls on a shift!

ar

VK3

Barry Robinson VK3JBR
Website: www.amateurradio.com.au
Email: arv@amateurradio.com.au

Foundation callsigns on air

A very warm welcome is extended to those who have entered amateur radio via the new Foundation Licence. Members are encouraged to provide on air support and where possible some mentoring for them.

Make their introduction to the amateur bands memorable as they explore what our hobby has to offer. Amateur Radio Victoria is available to assist any newcomer or those interested in joining the amateur radio community.

Member input being sought

At the Amateur Radio Victoria AGM on 25 May, there was discussion about the role of our statewide organisation, the need to review membership services and consider potential member involvement activities.

A number of members at the AGM indicated that they were willing to take part in a whiteboard think-tank session, throw around a few ideas and consider the suggestions of other members.

Amateur Radio Victoria, since the collapse of the WIA federation in mid-2004, has built up a membership base in excess of 600 members and is financially sound.

Now all members are being invited to submit their views and suggest topics that could be examined in the exercise to determine the future direction of their organisation.

This is an important exercise. It does not matter where you're located, or if you are able or not to attend the think-tank session, please provide your thoughts now. These can be by letter, fax or email.

It may help to ask two simple questions:

1. *"What do I want Amateur Radio Victoria to do?"*
   (Consider its uniqueness of being both a statewide organisation and having its office located in the centre of Greater Melbourne. A new era has begun with licence restructure creating opportunities and challenges.)
2. *"What do I like or not like about Amateur Radio Victoria?"*
   The responses received will be used to compile an agenda for the think-tank session to be held on Saturday 19 November.

Support for the hobby

Amateur Radio Victoria at its recent Council meeting carefully considered three requests for assistance for works needed on voice repeaters at Bendigo, Geelong and East Gippsland.

The Midland Amateur Radio Club, Geelong Amateur Radio Club and East Gippsland sought help because the repeaters they maintain are part of the Amateur Radio Victoria network, and the funding required is outside the scope of their finances.

In relation to those projects, Amateur Radio Victoria funding will be around $2,000 this calendar year and in 2006 more than $4,070. In addition, we budget for around $5,000 a year for repeater site leases and power, $4,000 licence fees, plus $2,000 for maintenance.

The members of Amateur Radio Victoria contribute to these and other services through their membership subscriptions.

Election and end of year arrangements

With the retirements of at least two councillors there will be vacancies on the Amateur Radio Victoria Council for the 2006-2009 elections.

Nominations that can be made on a form available from the Secretary are now open and close at 2.30pm on Thursday 23 February, 2006. Notices of Motion for the AGM to be held on Wednesday 24 May, 2006, close on the same day.

The last day of the year for our office is Tuesday 20 December, 2005 and it reopens Tuesday 7 February, 2006.

John Brown VK3JJB will retire from his position as Company Secretary at the end of his term. A replacement is needed from within the membership and ideally identified now so that a smooth hand-over can occur. Anyone interested to learn more should contact the President, Jim Linton VK3PC.

Special event stations

ACMA has responded positively to Amateur Radio Victoria's requests for special event callsigns for use in relation to celebrating next year's Commonwealth Games.

Two callsigns, AX3MCG (Melbourne Commonwealth Games) and AX3GAMES have now been issued. The plan is to have a set of commemorative QSL cards for both callsigns.

News from...

Geelong Radio and Electronics Society (GRES)

The third quarter of this year started with our annual general meeting. The office bearers for the 2005/6 year are President Keith VK3AFI, vice President Neil VK3XLJ, Secretary Keith VK3XKS, Treasurer John VK3TKH. The ordinary committee members are Garry VK3SZ, John VK3HJS, Neil VK3XNH, Albert VK3EFO, and Ranko VK3WDX.

Earlier in the year, the club purchased a commercial antenna analyser. This meter covers all amateur bands up to 70cm. Keith Vriens VK3AFI spent one evening explaining the theory of operation and uses of the analyser. This was followed up over two meeting nights by members using the meter to check out their home brew HF "screwdiver antennas". This piece of test equipment (like all our test equipment) is available for members to borrow. So far many members have borrowed it to check out their home station antennas.

One meeting night was devoted to the programming of "picaxe" chips. This was done under the instruction of John VK3TKH. Use was made of our 8 personal computers. Each computer had an additional monitor beside it. This monitor was connected through a video splitter and displayed the screen of the main computer that John was using. In this way he was able to give instructions to all on how to program the chip. After checking the program by computer simulation, the program was loaded into a picaxe chip and tested by running it. All who took part in the evening were given, for their own personal use, a CD containing relevant picaxe information.

We had one visit for the quarter. This was to the Belmont Fire Station. The emphasis was on communication. The fire officers explained how emergency communications were set up. We were shown their mobile communications van which utilises VHF/UHF radios in addition to fax and phone. The vehicle has its own power generator. Because most of our members are active in WICEN the evening was most informative.

Another interesting evening was "show and tell". Members brought along their latest homebrew projects. These included a battery charger using discarded electric blanket transformers. Other items shown were field strength and SWR meters, a pattern generator and an RF attenuator.

Our Wednesday morning group are still kept busy with various projects. This group has been assessing donated items for their historical value. These items are either restored for inclusion in our museum or put to one side for sale by auction in the future. A new computer has been built and commissioned. This will be used for e-mail and Internet access, as well as running programs of interest to club members.

As part of their "activities", one local scout group has made use of our workshop facilities. Two groups of 15 scouts over 2 nights made a flip-flop flashing LED circuit. Each participant was able to correctly assemble the circuit board and get it operating correctly. Once the project was finished they were allowed to keep the circuit board.

On the first and third Friday of each month there is a meeting of the computer group. These are informal meetings where interested members gather to discuss computer related topics. It is also a self help group. If a person has a computer problem, that problem can be solved by drawing on the combined expertise of the group members.

Club meetings are held every Thursday evening at the clubrooms. These are situated at 237B High Street Belmont commencing at 8 PM local time. Visitors are most welcome.

Rod Green VK3AYQ

Silent key

Jim Watt VK3KBG

21-7-25 – 12-10-05

Members of the East Gippsland Amateur Radio Club at Bairnsdale and his many friends in the Latrobe Valley will be saddened at the passing of Jim on Wednesday 12th Oct in the Bairnsdale hospital after a short illness.

Jim began his interest in radio on the 27 MHz band before the days of it being a legal CB band. He was a very active member of the Latrobe Valley GL club in those early days. He later made the move to amateur radio with his current call sign and was active for many years from his home in Morwell. Jim was a courteous operator and always had a kind word for all comers.

Jim also had another interest in boating and owned a motor cruiser at Paynesville. For many years Jim and his wife Mavis (deceased) spent most of their weekends and all of their holidays cruising the Gippsland Lakes and made many friends at the Paynesville Motor Cruiser Club where he was made a life member.

After the death of his wife Jim sold up the house at Morwell, bought a larger boat and lived full time on the water. In recent years Jim had the misfortune to have one leg amputated which made life on the boat very difficult.

Jim will be remembered as a kind and thoughtful person who enjoyed life despite his many health problems.

Our sympathies are with sons Jim, Greg and Phil and their families.

Bob Neal. VK3ZAN.
Secretary EGARC.

Christine Taylor VK5CTY

Contest logs

Well, by the time you read this it will be too late to send in your logs for the ALARA Contest, but there is another use to which you can put those contacts.

In how many different VK states did you contact YLs? If there were five different states and you have made ten or more contacts with VK YLs you can send off for an ALARA Award. It is an attractive addition to your collection and worth the effort. DX operators need only five contacts from four different VK Call areas.

We have a new Awards Custodian, Kathy VK3XBA QTHR the call book. Why not drop her a note including $A5 or 4 IRCs. She will be delighted to have some work to do.

If you already have the Award but have made some new VK contacts, there are endorsement stickers for the extra 10 stations for VK operators or 5 for DX operators available for just $A1.

The ALARAmeet

As we expected, Marilyn did a great job arranging an interesting and busy ALARAmeet in Mildura. Fifty of us enjoyed lots of talk and some interesting and varied places in and around Mildura.

As usual there was a pre-Meet dinner on the Friday at which there were nearly as many as there were for the official dinner on the Saturday night. Marilyn had planned the meals so that alternate places were served different food both on Friday and Saturday. We could exchange our plates if we wished, of course, as some people did.

Not everyone had encountered this idea before but it makes quite a difference in cost, as we can understand. The kitchen does not have to over-order to cater for choices, at all. Ordering food for any restaurant must be a nightmare. The food and the choices Marilyn made for us all through the weekend were very good, everyone agreed.

The main venue for the ALARAmeet was in a conference room at the Sandor Motor Inn on the main street so no one had trouble finding it. For some attendees it was just a matter of walking out of their room and across the path into the conference room. There was plenty of parking at the back of the Motor Inn for those in the Caravan Park, too. With a pleasant garden and pool to look out and enough space for our displays and to allow us to move around to talk to each other, it was an excellent meeting place.

In the bush chapel. Jenny Zietz in the pulpit, Dot VK2DB sitting in the minister's chair and Raija SM0HNV standing nearby.

A special presentation was made during the ALARAmeet, to Pat VK3OZ who has won the Florence McKenzie Trophy four times in the last five years – incidentally it is time someone gave her some competition – hint, hint! A photo of the presentation was included in the last AR but did you take note of the patchwork banner behind the scenes. Marilyn had made this to include photos of the groups of YLs from the earlier ALARAmeets to commemorate that ALARA was founded 30 years ago and this Meet was also celebrating 21 years of these gatherings, in the same city as the first one in 1984.

To cap off Pat's pleasure with the special presentation, hers was the number drawn out of the hat to take the banner home!

After official photographs etc we all piled into a bus which took us out to the Inland Botanical Gardens. This is a garden with a difference. There is an extensive rose garden; just coming into bloom which was set up immediately the land was assigned as a botanical garden. This gave the organisers something to show visitors, very quickly. However, the main focus of the volunteers who plan the gardens, is to have display areas with plants from all parts of Australia, to demonstrate what can and what cannot be grown in the Mildura area. I am sure this is an idea which could be copied by botanical gardens in other places. It must be very useful to the local gardeners.

One most interesting area we were shown was a bush chapel, with pulpit and pews all carved out of local timber. We were told that the church had been used for weddings already. On a good day (and Mildura has many more of those than most places) it would have been a lovely setting for memories.

On the Sunday we visited two wineries and a dried fruit complex, finishing the tour at an asparagus farm. I am sure we all found things to interest us in such a variety. I suspect most of us will be looking at the dried fruit and the asparagus in the supermarkets with new eyes because we had seen how these foods are prepared for market.

Unfortunately the official MEET had to end on Sunday afternoon when the ALARA banner was folded and handed to Bev VK6DE as Vice-president, for

transport to Tasmania where we will meet again in three years time.

We had been delighted to have Susan VK7LUV, the President of ALARA, with us for the Saturday but, due to family commitments, she had to fly out early on Sunday morning. She will be the co-ordinator for the next ALARAmeet.

Raija SM0HVN had travelled the furthest, from Sweden via Caboolture where she stayed with June VK4SJ for a few days before driving with her down to Mildura. They were planning to continue via Melbourne to Tasmania where they would tour for another week or so.

We had our New Zealand contingent, some regulars, others for the first time. We had Bev and Poppy VK6YF from the West; June, Val VK4VR and Ann VK4ANN from Queensland with Dot VK2DB to represent NSW with the rest of us from VK3 and VK5 (or should we make that VK-thrive?) It is great to be able to make new friends and renew old ones every three years. Amateur radio is a great hobby!

A special luncheon

At the ALARAmeet it was announced that there would be a special luncheon held in Melbourne to coincide with the presence in that city of some of the visitors. The VK3 girls used to hold regular luncheons but these have lapsed in the last year or so partly because of the difficulty of finding suitable venues when the one you have used for years closes down!

Rosemary ZL1RO, Marlene VK3WQ, Mavis VK3KS, and Lynette ZL1LL and the two OMs at the luncheon

June, Kathy VK3ZBA (standing), Christine VK5CTY, Muriel standing behind and Gwen VK3DYL

Raija and June were there before taking off for Tasmania. Rosemary ZL1RO, President of our sister organisation, WARO, and Lynette ZL1LL and their OMs, along with Christine from VK5 and five VK3s, Mavis VK3KS, Marlene VK3WQ, Gwen VK3DYL, Kathy VK3ZBA and Muriel May enjoyed a very pleasant couple of hours unwinding from a busy weekend.

Royal Show prizes – again!

Barbara VK3BYK with her lovely lingerie, took away three or four prizes. I am sure most people would be scared to wear the lovely garments for fear of damaging them, but they look just marvelous.

Maria VK5BMT entered some of her embroidery again and won prizes. I saw the really beautiful cross-stitched cubes hung as if on a Christmas tree, but I believe I missed her other entry. Sorry to say I also missed seeing the bobbin lace entry from Shirley VK5JSH, but others did see it. Congratulations all of you, you do lovely work.

ar

Beyond our shores

David A. Pilley VK2AYD
Vk2ayd@wia.org.au

Again not too much to report on with happenings around the world so, for those lovers of CW, I thought the following may interest you.

High Speed Telegraphy (HST)

The following is from the IARU Region 3 Newsletter 3/2005. High Speed Telegraphy (HST) is an amateur radio activity with a more than 40-year history in Europe. It is a sport adapted to amateur radio, a real challenge for the lovers of Morse code (CW).

The sportsmen compete in three tests. The first test is reception and transmission of letter text, figure text and mixed text. The computer generates the reception texts, starting from an initial speed of 80 marks per minute and increasing the speed until everyone gives up. In the transmission test any kind of Morse key/keyer is allowed. The aim (both in reception and transmission) is reaching as high as possible speed with as few as possible errors.

The second test is reception of call signs generated by the computer (the so called RUFZ test). After any correctly received call sign the next one comes with higher speed, and the opposite - after any wrongly received call sign the next one comes with lower speed. The aim is to receive correctly as many as possible call signs within three minutes.

The third test is pile-up test (the so called PED test). The computer simulates a real HF contest with a typical noise as on the air, with numerous contestants calling you simultaneously and thus creating a strong QRM. The aim is to make as many as possible real QSOs within three minutes with correctly received and sent call signs of the correspondents and correctly exchanged RST reports.

To practice, the equipment needed is a computer and a Morse key/keyer. HST is very beneficial for self-education. Activity on the air is the best training but there are lots of software or interactive sites in the Web, especially designed for mastering the HST abilities.

The biggest events in HST are the World HST Championships, held in the odd years. Six World Championships are already in history showing an increasing number of participants from all three IARU Regions. It should be underlined that Japanese, Korean and Chinese societies have already participated in some of them. At the same time there are lots of CW clubs all over the world, including those in Region 2, that are not only possible participants in the future, but, furthermore, the abilities of their members can easily lead them to the winning position.

(This report was by Panayot LZ1US)

Africa

The cell phone rage

In just five years, the number of wireless users in Africa jumped from about 7 million to more than 76 million. This, as even remote villagers grasp for a technology that few outsiders thought they needed or wanted.

In spite of the obstacles faced in recharging handsets from scarce automotive batteries, the phones are being put to uses not even imagined by those erecting the networks. Inhabitants in two provinces are so eager for service that they have built 50 foot high tree houses to catch signals from distant cell sites. They climb them with their cell-phones in hand to use them from the lofty perch. More on this fascinating use of wireless is on line at http://tinyurl.co/at5vv (CGC)

(Now what's this about not making the local 2 m repeater?)

(Arnewsline 1467)

USA

Code or not to code

It was bound to happen! You can please some of the people some of the time, but there is always one out there.... When the FCC asked for comments on the proposal to drop the Morse requirement, it was asked

"What about a code licence. A CW license independent from all others? You could be anything from a Technician with code to an Extra without code and your frequency privileges would vary accordingly."

(Arnewsline)

UK

Antenna designer Gordon Bird G4ZU: SK

Antenna pioneer Gordon Bird G4ZU, has passed away. Well recognized for re-shaping the construction of antennas and their theory of operation, Bird passed away at Malves en Minervois in South France on August 16th.

During his career as a chief electronics engineer and manager he worked for the British Post and Telecommunications, NATO and the United Kingdom Ministry of Defense. His antenna designs include the "Bow-and-Arrow Yagi" the Minibeam and the famed "Birdcage" designs. A friend, Jean-Claude Menardn F8ND, reported Bird's passing. He was 86.

(GB2RS)

Europe

SSETI Express Competition

The European Space Agency (ESA) education department has announced an award to the radio amateur who submits the largest number of valid telemetry and payload packets from the student-built SSETI Express satellite. Telemetry may be received on any band to qualify for the award.

SSETI Express is scheduled for launch September 27 from Plesetsk in northern Russia. It will downlink telemetry and payload data in AX.25 format at 9k6 bps on 437.250 MHz and at 38k4 bps on 2401.835 MHz. The satellite later will also be available as a single-channel Amateur Radio FM transponder.

All radio amateurs interested in competing for this award are encouraged to download the necessary software from the SSETI Express Web site http://www.sseti.org/express and to use the SERACC system to forward the telemetry and payload data to SSETI Express Mission Control. Submissions will be automatically recorded, and the Web site will display a leader board.

The winner will be the amateur at the top of the leader board at 0000 UTC on January 1, 2006. The winner will be offered the opportunity to visit the Student Technology Education Conference and Exhibition next spring

in Germany. The three-day event is similar to the AMSAT-NA Symposium and the AMSAT-UK Colloquium. In addition, the winner will be invited to visit ESA's Mission Operations Centre (ESOC) near Darmstadt, Germany, for a private escorted tour of the facilities. ESOC currently controls many orbital and deep space missions and will be responsible for the European Columbus module when it joins the International Space Station.

The prize includes economy-class travel, accommodations and a modest daily subsistence allowance.

(ARRL)

UK

Space observations

A newly formed Amateur Radio group called SOAR – Space Observation with Amateur Radio – is aiming to get their balloons aloft in the U.K.. The group wants to use meteorological balloons to carry out amateur radio experiments to altitudes in excess of 90,000ft. It is hoped that through such projects it will help build bridges between the amateur radio fraternity and schools and colleges. They intend to launch payloads including cross-band repeaters, amateur television devices and automatic packet position reporting systems. If you are interested, check out their website at www.eham.org.uk.

(RSGB)

ar

Spotlight on SWLing

Robin L. Harwood VK7RH

Instabilities and threats to SWL

Propagation is still quite unstable and there have been several major disturbances during this quarter. I do notice that frequencies above 17 MHz rarely propagate during daylight hours. This may improve slightly as summer rapidly approaches. One regular station, Radio New Zealand International, has not been heard on 15720 but this is not due to propagation as construction work is underway upgrading antennas in daylight hours. A second DRM-compatible transmitter should be operational in 2006. I presume that RNZI would be operational at weekends.

Radio Australia has apparently reintroduced news bulletins in French after some time. Also an Australian-produced English language teaching program called Radio Kangeru is heard over a shortwave relay of the main domestic RRI station from Jakarta. It has been heard on 9680 between 1005 and 1040 weekdays. A similar Indonesian language program from Australia has occasionally been heard over provincial stations for many years but this is the first foreign produced English language program I have heard over RRI and believe that the program may be compiled in Bali.

Elsewhere you may have read that Tasmania's main retail electricity supplier, Aurora, has commenced BPL trials in suburbs of Hobart and shortly here in Launceston. I personally am dreading the impact that this will have on my enjoyment of shortwave monitoring and future HF operations. I am pleased that southern hams were able to bring to the media's notice the interference implications to amateur and other HF users from BPL yet Aurora dismissed these valid concerns. Several weeks after the launch a new fibre-optic trial also was announced by the State Government in Hobart and Devonport. Again Aurora will be responsible for the operation and maintenance and I believe that the fibre-optic cable will come from boxes near the power lines. Why Aurora is investing in BPL when the rest of the world is ditching it is beyond me.

Zimbabwe is consistently being heard here on 6612. Originally thought to be a harmonic, there is continuing evidence that the usage of a channel within a non-broadcasting allocation is deliberate. I hear the station with modulation at a low level at 2000 and later at 0400 but it quickly fades out after the local sunrise.

Well that is all for this month. I sincerely hope that I will continue to listen on shortwave despite BPL being shortly trialled here in Launceston.

ar

Making shunts for ammeters *continued*

1 mm = $\frac{(1000 \times 0.1)}{6}$ = 16.7 rounded to 17 mm

We need about 10 mm each end for terminating, so 10 x 37 mm wires are cut from the Cuprothal coil. In this instance, two bundles of five strands, each formed into a U, have been soldered to the circuit board foil to form the 10 A shunt, pictured in Photo 3. Note again how the connecting wires, which carry the main current, are soldered right at the shunt wire terminations.

Accuracy should be checked using the set-up shown in Fig. 3. For a typical 12 Vdc supply, resistance R will need to be about 1.2 ohms, suitably rated to dissipate 120 W for the time necessary to make the test.

**For each degree rise above a specified temperature of a conductor, each ohm of resistance of the conductor is increased by a constant amount called the "specific coefficient of resistance".*

For example, pure solid copper has a temperature coefficient of about +0.004 per degree C. That is, if a certain piece of copper wire has a resistance of 1 ohm at 0 degrees C, it will have a resistance of 1.004 ohms at 1 degree, and 1.4 ohms at 100 degrees C.

References and Further Reading

1. Test Equipment for the Radio Amateur, F. Smith, G4FZH, RSGB, pp6 ~ 9.
2. The ARRL Handbook for Radio Amateurs; see Ch 26 in any recent edition.
3. "How to Measure Large Direct Currents with Common Ammeters" D. Poeth II, K8TM, QST Jan '96 pp40 ~ 43.
4. "Rescaling and Customizing Meter Faces"; R. Lumachi,W2COM, QST, Mar. 2004, pp59 ~ 61.

ar

DX - News & views

VK4OQ,
P.O. Box 7665, Toowoomba Mail Centre, QLD 4352.
Email: john.bazley@bigpond.com

DXpedition to KH7, Kure Island: a milestone

Over the years DXpeditions have increased the facilities available, enabling more information to be exchanged between DX spots and amateurs trying to work them. Pilot stations were a great step forward, an idea originally suggested by John ON4UN. They have enabled areas of the world experiencing difficulties, usually due to marginal conditions, to make a QSO. Then we became accustomed to using 'on-line logs' to check that we were definitely in the log. Now with the DXA facility for the KH7 operation, the organisers have taken a giant leap forward.

For those who do not have Internet access – a brief description of DXA:

The DXA facility is an innovative web application that allows DXers to view the current status and activities of the DXpedition in near real time. Within a few minutes after making a contact, the DXer will be able to see confirmation entered in the expedition log. Information such as the callsigns logged in the last minute and in the last hour, the bands and modes currently being used by the DXpedition are displayed in a simple, automatically updated interface. The entire application runs within a standard browser – no software to be downloaded or installed (except a plug-in to play audio tracks).

When the KH7 operators log a QSO with you, they illuminate a green square in your table for the appropriate band and mode, confirming your entry in the log. Once you see the green square you can be absolutely certain that you have not worked a pirate. The map shows the most recently logged callsigns in their DXCC positions, as well as a set of ellipses that show the predicted propagation. Red ellipses are expected to have the highest signal strength, black the lowest. The callsigns shown recently logged are not correlated with these band propagation ellipses.

Also displayed is the time the DXpedition has been operating and how much longer they will be there, the number of QSOs logged and the time at your location and GMT.

With so many new facilities being introduced at the same time, there were bound to be teething troubles. Due to the high demand at certain times, some of the facilities have been disabled. To most of us the log and band activity were the main concern. It has taken a lot of hard work at Kure to get the definitive log onto DXA. To get some idea of their "problems" I quote from a news message dated 29th September.

"HOT NEWS! Our server has been up for one full day without crashing!

Current Time: Thursday 29th September 18:29 GMT

Server uptime: 1 day 1 hour 20 mins and 24 seconds

Total accesses 4,666,979". (Over 4 million. No wonder they had troubles!)

I am sure the planners of this facility knew they would meet problems, but did not realise the interest in the project and the number of amateurs who would access the programme. It is easy to criticise, but "nothing ventured – nothing gained" really does apply. What has been gained? A totally new concept of communication between DXpeditions and amateurs on amateur bands.The term "Green Squares" is going to take on a new meaning in the DX field! Rest assured the problems will be solved and variations of DXA are here to stay.

So what have we got to look forward to after all the activity from Kure Island?

St Pierre and Miquelon - AC8W, K8AQM, K8DD, K8GL, K8MM and W8IQ will be operating from there from 22nd to 28th November. They will also participate in the CQ WW DX CW Contest as FP/K8DD.

Sudan – Dane, S57CQ returned to Sudan in September and will be there for another year He will operate again using the call ST2T. QSL via S57DX.

ZD8 – Mike, G4LTI reports that Ian's (ZD8I) stay on Ascension Island has been extended until June 2008.

The Clipperton DX Club team (F2VX, F9DK, G0LMX and F5LMJ) that operated as A52FH in 2000 and A52CDX in 2004 will return to Bhutan from 18 November to 3 December 2005. They will be at the Ham centre in Thimphu on 18-29 November, and will also try to be active from Bumtang and the valley of Paro. It will not be a DXpedition but a project to promote the growth of amateur radio in Bhutan, and radio equipment will be donated in order to help establish new club stations in the east of the country. QSL via F9DK, direct or bureau.

K1NA, Jim, will be operating in the CQ WW CW DX Contest as PJ5NA from St. Maarten (NA-145). He'll be single-op in the all-band category. QSL direct only via K1NA.

N6TJ, will operate as 9Y4AA on all bands for CQWW CW in November.

NN1N, Dave; K9ZO, Ralph; and AG9A, Mark, plan to operate the CQ WW CW DX Contest with special call 5J1W from Colombia on November 26th and 27th. They'll be doing multi-single. QSL via NN1N.

Once again JE1JKL, Saty, will be QRV in the CQ World Wide CW Contest from Labuan Island (OC-133), East Malaysia as 9M6NA. He plans to be single-op 20 metre only. QSL via JE1JKL.

W6NRJ, Jim, plans to be on from the Bahamas with his friend N6KD in the first week of December. Activity will be on 12 through 80 metres

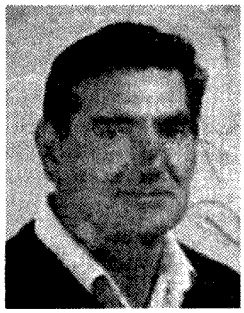
Potomac Valley Radio Club (PVRC) ops W3GG, Burt, and his nephew WD3I, Mark, plan to operate in the CQ WW CW DX Contest at the end of November from Israel. They will be multi-op as 4X0G. They will also be joined by nationals 4X6ZK, 4Z4DX and 4Z5KJ. Before and after the contest look for them to be QRV as 4X/W3GG and 4X/WD3I.

The Glorioso DXpedition expected between October and November with F5CW, Dany, and others, is still waiting for approval from the French government. Organizers feel they will be able to go in late November but will not get the permission until the last moment.

Thanks to the authors of The Daily DX (W3UR) - 425 Dx News (I1JQJ) and QTC DX PY2AA for information appearing in this month's DX News & Views. **ar**

Silent key

Donald (Don) Shand, VK3DZM



It is with a heavy heart that I commemorate the life of my good friend Don, VK3DZM, who passed away on 4th June while on his return trip from the United States and Britain where he had been visiting and staying with amateur radio friends.

Don, after many years of total dedication, had progressed from being a short wave listener, to gaining his novice licence and finally his full-call to end up being a very well liked and respected international figure in the area of 80 metres phone DX.

There is probably no better testimonial to Don's life in amateur radio than the emails received in response to the news of his passing. The following are a few brief snips:

Don was always a gentleman whose potent signal and friendly voice made dragging my rear end out of bed at sunrise a little more bearable. .... . sunrise on 75m will not be the same without him! Les, N1SV

Phil, W6UC, Fred, W6UA and myself spent the weekend with Don at Visilia, CA during the DX Convention. We had a great time and enjoyed meeting Don eyeball-to-eyeball. He was a fun spirited fellow and it was always a kick to chat with him on 75 meters. Bill - WA5VGI

Amongst the regular DXers on 80 in Europe the call sign VK3DZM was a very popular one. He always had such a strong signal due to his 4 square and also because he was always fair in sharing and helping other VK stations to work the DX with him. .....he did have a reputation amongst all the regulars on 80 as one of the band's finest gentlemen and also probably one of the most popular stations on the band....many stations have told me that Don was their first VK contact and that his call sign was just part of the 80 metre band. I know the band will never be the same again without him. Jon G0NVD

Don was born in Palmerston North, New Zealand in 1936. He initially worked on a dairy farm and while there he used to visit a neighbouring farmer who held an amateur radio licence. This was the starting point in Don's life long interest in amateur radio.

Don came to Australia on two occasions looking for work and finally found some in Melbourne. From there he courted Jan whom he had met in his home town of Palmerston North. The outcome of this was that he and Jan married and settled down on a property in Western Victoria at a little place called Langkoop. Don was a family man and he and Jan had three daughters and a son.

I first knew Don as a neighbouring farmer with whom I had a lot in common including an interest in farming, the raising of a family and playing social tennis together. In addition I learnt that Don was a keen short wave listener. When a TAFE class was run for the Novice Amateur Licence in nearby Naracoorte, Don became one of the enthusiastic attendees. The result was that Don gained his Novice certificate and took the call sign VK3NSD in 1979 and then, after a lot of hard work, Don passed his 10 wpm CW exam and the full theory to gain his Amateur Operator's Certificate of Proficiency in 1985. Following on from the TAFE classes the Naracoorte Amateur Radio Club was formed with Don as a very strong supporter.

While all of the above was going on Don was also busily helping raise their young family and in addition coping with a rural depression all of which could not have been done without the full support of Jan, a Massee Agricultural College graduate

Don was an avid supporter of the All Blacks rugby team of New Zealand. He enjoyed playing tennis with a group of locals called "The Rugged and Buggered" and hosted many evening games in the summer under lights at home. In more recent years he became very interested in watching old black and white movies.

At a community level Don was a base radio operator for the Apsley Group of the Country Fire Authority. He was also involved with local farmer groups, especially during the tougher times on the land. As a radio amateur he had been one of the instigators for extending the DX segment on 80 metres (75 metres).

Don had worked (but had not claimed) 296 confirmed countries using phone on 80 metres towards a DXCC award. This, incidentally, is a far harder goal to achieve in Australia than from the other side of the globe.

Don received the following awards that I know of: In 1989 the award for working all of the states of America (WAS). The ARRL International Contest Award for first place as a single operator, 80-metres phone for Australia in 1993, 2001 and 2003 with a fifth place in the world in 2001. The CQ World-Wide DX Contest for single operator 3.7 MHz SSB for Australia #1. The WIA VK-ZL Oceania DX Contest - first place for Australia in 1991 and 1992.

The link below has recordings of VK3DZM as heard in Salt Lake City, USA while working some of the locals from his home QTH. (There are three recordings).

http://www.smeter.net/slc/reception/examples.php

73 Don, VK3DZM, you will be sadly missed by all those who knew you.

George Stewart, VK5ALS

Plan ahead

The Central Coast Field Day 2006

19th February 2006

Healesville ARG

White Elephant

26 February 2006

Contests

Ian Godsil VK3JS
WIA National Contests Co-ordinator

Contest Calendar November 2005 - January 2006

Nov	12/13	Japan Intl. DX Contest	(SSB)
	12/13	Worked All Europe DX Contest	(RTTY)
	12/13	Spring Field Day	(VHF+)
	26/27	CQ WW DX Contest	(CW)
Dec.	3	RTTY Melee	(RTTY)
	10/11	ARRL 10 Metres Contest	(CW/SSB)
	17	OK DX RTTY Contest	(RTTY)
	26	Ross Hull Memorial VHF Contest	(VHF+)
	(to 15 Jan 06)		
Jan	7/8	ARRL RTTY Roundup	(RTTY)
	14/15	Summer VHF+ Field Day	(CW, SSB, FM)
	28/29	REF Contest	(CW)
	28/29	BARTG RTTY Sprint Contest	(RTTY)
	28/29	UBA DX Contest	(SSB)

Greetings to all readers

Over the last few months you will be aware that I have been trying to stimulate discussion about the use of logging programs in modern-day contests.

I take this opportunity to say thank you to several operators who took the trouble to express their thoughts, either via email or in conversation. I am also pleased to acknowledge that the chaps who responded are all active amateurs, not just those who have an occasional contact in some of our local contests, particularly the Remembrance Day Contest.

It is very easy for someone doing a task to think that others could be doing their part of the task the same way. I am assured by the above operators that there are plenty of people who use computers all week in their working situations and the last thing that they want to do is to be machine-bound in their shacks. They want to ENJOY their hobby when they can get to it.

Fair enough and I thank them again for this point of view. If, however, the inference is that the hobby of Amateur Radio can only be "enjoyed" if carried out in a non-keyboard environment, then there may be room for argument. However, I see their point, and I am sure that there will be readers amongst you who will agree.

Nevertheless, please do not overlook the fact that

(1) there are contests other than our VK events,

(2) these world-wide DX contests afford greater opportunities for testing and improving our abilities, capabilities and station performance than local contests can,

(3) most of the Managers of these events require logs in an electronic format – eg the Oceania DX Contest last month requires logs of more than 50 contacts to be in the Cabrillo format.

VK Contest Loggers

2005 I thought was a year of achievement in the development of logging programs for Australian contests, and this is partly my motivation in wanting to see them more widely used by VK hams. Much of this was fostered by Chris Edmondson VK4AA, the new Manager of the RD Contest, who set about encouraging people to develop a program for this year's event, even allowing for a few "curlies" in the revised scoring system.

That I heard many stations during the RD talking about their loggers was a tribute to John VK5DJ, whose program was posted on the WIA web site and obviously widely used. On behalf of all contestants, I thank John for his good work in getting this program modified in time from an earlier version. If you used John's program, please let him or the RD Manager know your thoughts about it – only this way can improvements be effected.

John's was not the only logger available for the RD. Mike VK3AVV has had a program for several years now and also managed to revise it to encompass this year's rule changes. I used this program and found only one insignificant "bug". Truly, there was no need to do any post-contest changes of any type, just print the log and send.

I commend Mike's VK Contest Logger to you all as an easy-to-use program for Windows platform. Also Mike has included areas in the logger for the VK/trans-Tasman Contest, ALARA and Oceania DX. This makes it a very versatile program for several Australian events. Mike assures me that it would not be difficult to add other modules when required.

Another VK ham who has done really good work in writing programs for some VK contests is Alan VK4SN. Alan has his own web site and on it you will find programs for the VK/trans-Tasman Contest and John Moyle Field Day. These are written for Windows, but they do require the user to have MS Access and XL (full version, not the cut-down version found in MS Works) as part of his Windows installation.

The program for the VK/trans-Tasman

Contest is a post-contest unit, but quite easy to use as long as you don't forget one or two little things in the bottom right-hand corner. These apply particularly to bonus points for distance and QRP.

The JMFD logger is quite intuitive, even if you are in a car. Here of course is where the laptop computer comes into its own.

Programs like these show that we have chaps in our home ranks who can develop things for modern AR usage. I urge you all to look at the above programs before next year's contests come around. I suppose it boils down to whether you may be interested in a mono- or multi-event layout. Whichever way you go, I urge you all to investigate using modern aids to logging and if you do decide to adopt them, PRACTISE, PRACTISE, PRACTISE BEFOREHAND!!! This cannot be stressed enough, as things happen in the excitement of contests that may just cause you to lose time and/or data if you are not completely careful.

Keep smiling and good contesting.

73, Ian Godsil VK3JS
WIA National Contests Co-ordinator

Results Dutch PACC Contest 2005

(VKs only)

VK2GWK	Single Operator	840 points
VK4TT	" "	592
VK6NU	" "	1728
VK6ERA	" "	1508
VK8AV	" "	2100

Results QRP Day 2005

From Ron Everingham VK4EV

VK2AVQ/QRP	46 points
VK3JS/QRP	38
VK2AWD/QRP	23
VK2GR/QRP	20
VK5BLS/QRP	14
VK2ZCM/QRP	9
VK4TGL/QRP	2

Rules: Ross Hull VHF Memorial Contest 2005 – 2006

From John Martin (VK3KWA),Contest Manager

The next Ross Hull Contest will run from December 26 to January 15. Logs will be due by February 6. The rules will be the same as for last year.

The Contest

The WIA maintains a perpetual trophy in honour of the late Ross A. Hull and his pioneering achievements in VHF and UHF operation. The name of each year's contest winner is engraved on the trophy, and other awards may be made in the various divisions of the contest. The contest is open to all amateurs.

Duration

0000 UTC Sunday December 26, 2005 to 2400 UTC Sunday January 15, 2006.

In Eastern Summer Time, that is 11 a.m. on December 26 to 11 a.m. on January 15.

Sections

A: VHF - UHF (50 MHz through to 1296 MHz), non-digital modes.

B: Microwaves (1296 MHz and above), non-digital modes.

C: Digital Modes, all bands.

Digital modes are defined as those in which the decoding of the received signal is done by a computer. Entrants may submit logs for one or more sections.

General Rules

One callsign and one operator per station. One contact per station per band per UTC day. Repeater, satellite and crossband contacts are not permitted. No contest activity is permitted below 50.150 MHz. In Sections A and B, entrants making contact on recognised DX calling frequencies should not occupy these frequencies for prolonged periods. All rulings of the contest manager will be accepted as final.

Valid Contacts

For Sections A and B, entrants must exchange RS (or RST) reports plus a serial number. Serial numbers need not be consecutive. For difficult propagation modes such as meteor scatter, exchange of callsigns plus two further digits is sufficient. For Section C, exchange of callsigns plus two further digits.

Scoring

Scoring will be based on the best 7 UTC days nominated by the entrant. Each contact will be scored as follows:

For 2 metres and above, one point per 100 km or part thereof (i.e. up to 99 km: 1 point, 100 - 199 km: 2 points, etc).

For 6 metres only, contacts below 1000 km: as above. Contacts from 1000 km to 2400 km, 2 points regardless of distance. Contacts over 2400 km, 20 points regardless of distance.

The band multipliers are:

6 m	2 m	70 cm	23 cm	Higher
x 1	x 3	x 5	x 8	x 10

Logs

Logs must cover the full contest period and contain the following for each contact:

- Date and UTC time.
- Station location (if operating portable).
- Frequency and callsign of station worked.
- Reports and serial numbers sent and received.
- Approximate location or grid locator of station worked.
- Estimated distance worked and points claimed, including the band multiplier.

Separate scoring columns for each band would be helpful.

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).
- Section(s) entered, and a list of the UTC days to be scored.
- 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, and that the contest manager's ruling will be accepted as final.

Please use the following format for your scoring table. If you wish you can cross-check by adding the daily totals across the table, but please make sure that you include the separate band totals.

Date	6 m	2 m	70 cm	23 cm	etc
	-----	-----	-----	-----	----
Day 1	xxx	xxx	xxx	xxx	xxx
Day 2	xxx	xxx	xxx	xxx	xxx
etc.	-----	-----	-----	-----	-----
Total	xxx +	xxx +	xxx +	xxx +	xxx

= xxx **(GRAND TOTAL)**

A sample cover sheet and scoring table has been included in the postings on WIA web sites and the VK-VHF e-mail reflector. Copies can also be obtained from the e-mail address given below.

Penalties

Minor errors in distance estimates or calculations may be corrected and the score adjusted. Prolonged use of recognised DX calling frequencies (especially when the reports indicate strong signals) may incur a scoring penalty. Inclusion of any false log entries will lead to disqualification.

Entries

Paper logs may be posted to the Manager, Ross Hull Contest, 3 Vernal Avenue, Mitcham, Vic 3132. Electronic logs can be e-mailed to jmartin@xcel.net.au. The following log formats are acceptable: ASCII text, Office 97 or Office 2000 RTF, DOC, XLS or MDB.

Logs must be received by Monday, February 6, 2006. Early logs would be appreciated.

Note on Calculating Distances

Absolute accuracy is not required. You just need to know whether each station is above or below the nearest multiple of 100 km, so you can use a compass to draw 100 km circles around your location on a map. A more accurate method is to use six-digit Maidenhead locators and a program that can be obtained from the e-mail address given above.

ar

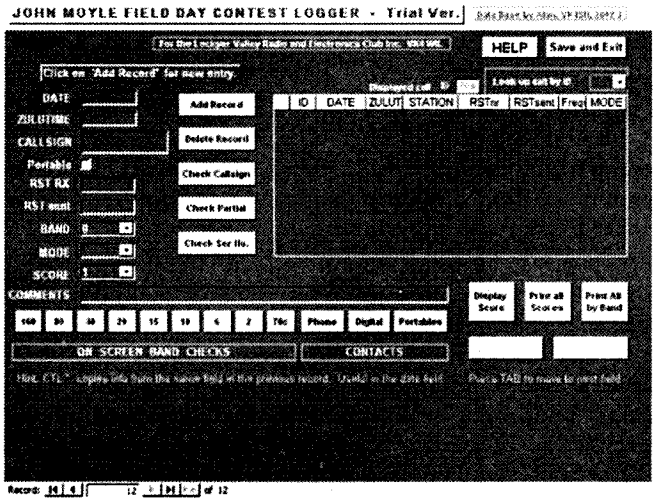


Fig. 1 Alan VK4SN's John Moyle FD logging page

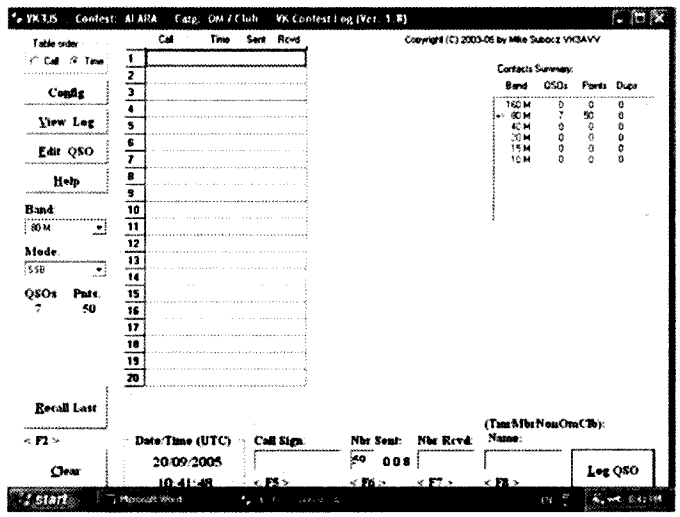


Fig. 2 Mike VK3AVV's logger page as set for ALARA Contest

Remembrance Day Contest 2005 Preliminary Results

The results for the 2005 Remembrance Day Contest are finally to hand. The result is a very convincing win to Western Australia.

Although the Victorians really pulled their socks up this year, I rather fear the decision to award bonus points based on the distance of a contact has helped WA to win. HOWEVER, while the result would have been less decisive, the VK6s would still have won even without the bonus points!

The Western Australian victory is principally based on its extraordinary VHF/UHF performance, clearly the star performer in submitted logs.

That said, we have one member who is quite possibly a "machine". Victorian member Ray Cowling, in using his four callsigns to great effect, has scored what is quite possibly the highest number of points _ever_ accrued by a single individual in RD contest history. Ray's quite remarkable score was more than 4000 points. The nearest individual score was a mere quarter of that tally!

The delay in finalising the results has been of my own making, I'm afraid. The level of confusion caused by the distance bonus meant I needed to recalculate virtually _every_ log, with some of them taking a considerable time. I am of the belief that we should remove the distance bonus, but that other bonuses (for late night operation, for remote areas, for CW and less-used bands) should remain. I would also like to introduce a points bonus for all contacts with Foundation Licensees in 2006.

Here are the final scores:

AREA	SCORE	RANK
VK6	973.37	1
VK3	527.23	2
VK5	200.19	3
VK7	151.86	4
VK4	79.806	5
VK1	45.269	6
VK2	37.645	7
VK8	2.0316	8

Details of all scores in December AR

Chris Edmondson, VK4AA / VK3CE
PO Box 123,
Eagle Heights,
Queensland 4271
07 5545 0666 phone
07 5545 3456 fax
0417 35 3599 mobile
ar

VHF/UHF - an expanding world

David Smith VK3HZ – vk3hz@wia.org.au
Leigh Rainbird VK2KRR – vk2krr@wia.org.au

Weak signal

David Smith - VK3HZ

The auroral activity reported in last month's column continued in early September. Jim VK3II at Coronet Bay reports: *"There were some very strong auroral signals on 2 m last Sunday 11 September from approx. 1615 - 1745 hrs local time. Quite a few Melbourne stations around and some were aurora-affected at this QTH. Stations heard and worked here on SSB included VK1ZQR, VK2GKA, VK2KRR, VK3ZQB, VK3DUT, VK5DK, VK5ZLX and VK7JG. Approximately 500 Hz positive offset was noticed on aurora-affected stations. TV channel 5A audio on 143.776 MHz from Newcastle was coming in around S5 during most of this. No stations north of VK2GKA were heard at this QTH. The 144.1 MHz calling freq. was very busy, most contacts taking place on the calling freq."*

VK4 Activity

There have been some unusual propagation conditions along the Queensland coast generating quite a bit of activity. Doug VK4OE provided the following extensive report: *"From what I have been able to determine, awareness of this opening commenced on the morning of 16 September when VK4KK in Emu Park just South of Yeppoon worked VK4FNQ in Charters Towers on 2 m SSB. For the next two weeks and more, the two had regular QSOs, always in the morning in the 6 am to 7 am time slot. John VK4FNQ was, of course, alert to the possibility of working stations further south and on 28th September he completed QSOs with several Brisbane stations including VK4AFL, VK4ZQ, VK4AML and VK4OE. It was most interesting to observe that propagation favoured different Brisbane stations at different times. These distances are around 570 km and the path is entirely over land.*

This propagation was due to a ridge of high pressure that, with a bit of waxing and waning, had stabilised itself along the Queensland coastline. Various BOM charts illustrate this and the Hepburn prediction charts clearly indicate that excellent conditions were present.

Through all this, John VK4FNQ was having frequent 2 m contacts with Russell VK4BEG and Keith VK4BKS in Malanda on the Atherton Tableland (inland from Cairns, altitude 750 metres). South Queensland stations became aware that there was a real possibility of also working them and this first occurred to VK4KK early on 20th September, a distance of close to 840 km.

Other stations involved were VK4TWR and VK4JOO in Gladstone, VK4AJS in Rockhampton, VK4BLK in Yeppoon and VK4TZL in Hervey Bay and they continue to be active in the weak signal arena.

The ridge of high pressure stayed in place for many days and every morning was a voyage of discovery as to which stations may be able to be worked. On 1st October the propagation between Central and North Queensland extended itself enough to include Brisbane. VK4AFL and VK4AML successfully completed contacts around 2030Z with VK4BEG on 2 metres, a distance of 1384 km to VK4AFL.

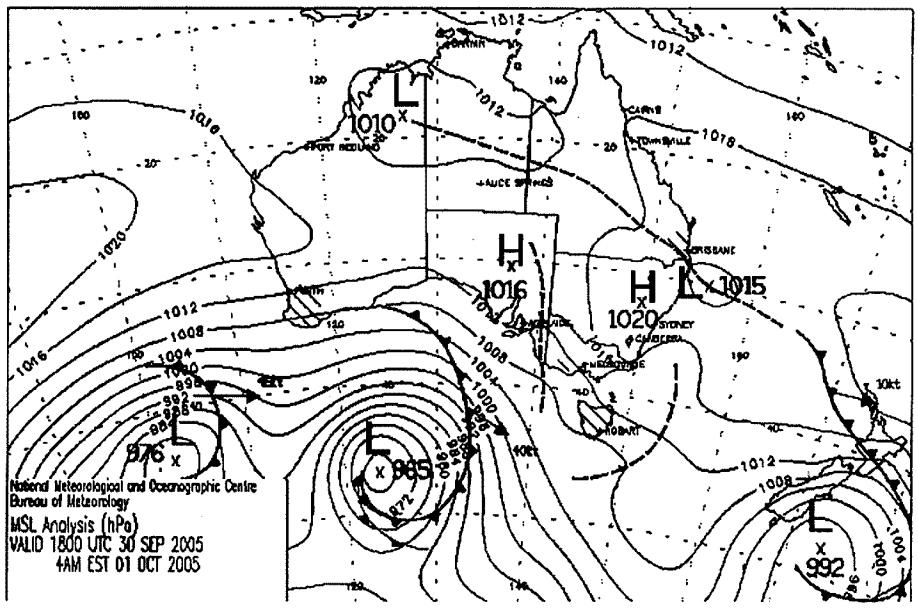
From Hervey Bay, Glenn VK4TZL's experience was that propagation really picked up to the north over the days 5th to 9th October. Frequent QSOs took place with the northern stations and there were times when stations 240 km away in Gladstone were swapping "30 dB over" reports with him, and this was off the back of each other's beams! The "contact of the month" for him was with VK4BEG on 70 cm at 2039Z on 7th October, a distance of 1160 km.

Also on 5th October, VK4ZQ (Brisbane) successfully contacted VK4BKS (Malanda) and with VK4WDM in Townsville on the 7th.

The ridge of high pressure eventually moved east and, as often happens with extensive inversions that don't dissipate quickly, it began affecting other propagation paths. Central Queensland stations became able to trigger an FM repeater ("triggerable beacon!") in New Caledonia with Brisbane stations Wayne VK4WS and Roy VK4ZQ reporting working Patrice FK8HA on 7th October through it.

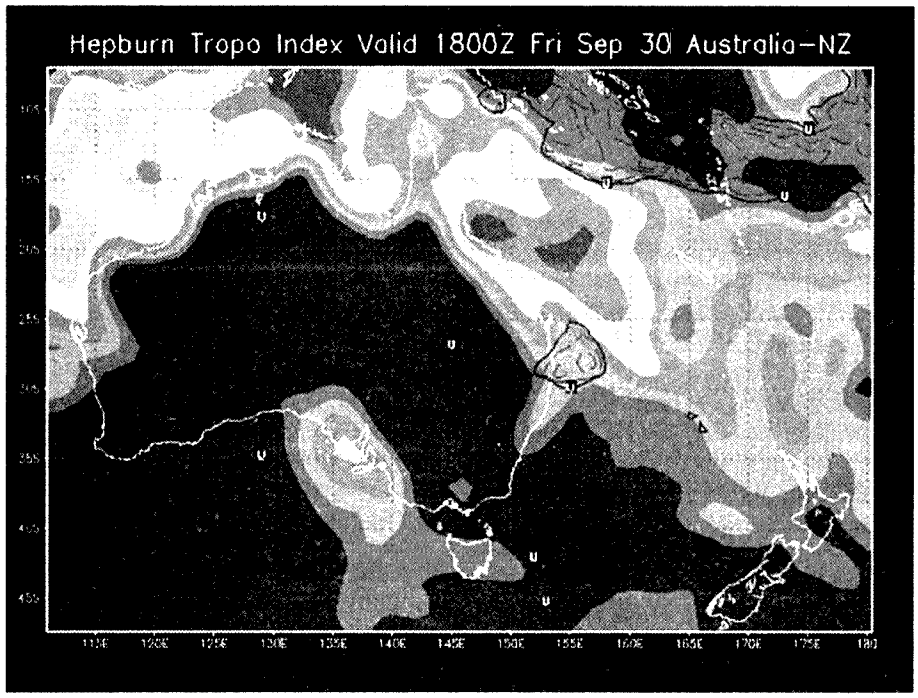
Through all this excitement, propagation from Brisbane to the south remained poor, again as was being predicted by the Hepburn charts.

It must be said that things like this have happened before, even on FM from Brisbane to Cairns but they have not been so dramatic or for such a length of time. Col VK4ACG is able to describe several times during his years of living



at Thursday Island (right at the tip of Cape York) that repeaters and stations not far short of Brisbane could be heard. He believes that extension even to ZL from there has occurred!

It has been the presence of active VHF/UHF operators in various places along the Queensland coast that has led to us knowing that it was actually happening. Let's all keep our awareness of potential long distance propagation alive by being active, calling instead of just listening, optimising station performance, and keeping in touch with each other. It takes two stations to make a contact!"



Mobile – with a difference

Chris VK2DO has recently been experimenting with mobile operations and aircraft-enhanced propagation on 2 m. From his home station, Chris is normally an S9+ signal into Melbourne when the aircraft are in the right place. However, he normally needs to be well on the way to work by the time the path peaks – usually around 0845 local time. So, he has mounted a trusty IC706 in his car and has been experimenting with various antennae. Initial tests with a vertical whip were disappointing and a horizontal halo, although of the correct polarisation, was also unimpressive due to its pickup of surrounding noise. So Chris now has a 4-element NBS yagi mounted to the fibreglass roof of his twin-cab Ute. The yagi is permanently pointed "left" in the direction of Melbourne for his northwesterly run into work. Using this setup, Chris has worked many distant stations including VK3's II, DUT, KEG, BJM, HZ and AFW. Even off the back of the beam, he has worked VK2's TG, GKA, APP and EMA. All this goes to show that you don't need 4 yagis and 400 watts to work long distances. If you pick your times, a modest setup can give quite impressive results.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital DX Modes

Rex Moncur – VK7MO

I have been somewhat out of the local scene while undertaking a one-man digital EME DXpedition to the Cocos-Keeling Islands, VK9C, and Christmas Island, VK9X, in the Indian Ocean. For me this was a most memorable experience with 155 EME contacts on two metres and eight on 70 cm. All from a small portable station that was carried as personal luggage on aircraft. The smallest station worked on 2 metres was Joe, VK7JG, who uses a single 3 el yagi without elevation. The 70 cm operation was a bonus using only a IC-910-H barefoot with 65 watts to an antenna. The 432 MHz antenna was an ad-hoc construction using insulation tape to stick elements to a squid pole left at Cocos-Keeling Islands by Bernd, VK2IA, and to an element of a 20 metre beam left by David VK2CZ at Christmas Island. One tropo contact was made from Christmas Island to Ron VK6KDD, in Port Hedland over 1767 km using JT65.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

The Magic Band – 6 m DX

Brian Cleland – VK5UBC

September has again been very quiet month on 6 m with very few reports of contacts.

Wayne VK4WS Brisbane worked Patrice FK8HA on the 9th September and Gary VK4ABW Townsville reports an opening to the JA1 area on the 25th September.

John VK4FNQ Charters Tower forwarded the following from his log:

30 Aug 2005	0448	50.110	VK5UBC	Heard 41
	0504	50.110	VK4BLK	Heard 519
	0516	50.110	VK5ZSA	Heard 41
3 Sep 2006	0456	50.079.00	FK8SIX	Beacon 529
4 Sep 2005	1045	50.046.30	VK8RAS	Beacon 529
7 Sep 2005	0225	50.046.30	VK8RAS	Beacon 559
	0300	50.046.30	VK8RAS	Beacon 519
		50.287.70	VK2RHV	Beacon 529
13 Sep 2005	0150	50.287.70	VK2RHV	Beacon 519
	0215	50.287.70	VK2RHV	Beacon 519
	0300	50.079.00	FK8SIX	Beacon 519
14 Sep 2005	0935	50.287.70	VK2RHV	Beacon 419
15 Sep 2005	2038	50.110	SOLAR BURST	
21 Sep 2005	0020	60.287.70	VK2RHV	Beacon 41

Have a look at this site - http://www.hb9six.org/ - to view the highest 6 m beacon in the world, recently heard in Canada.

Hopefully conditions will improve in October and early signs are good with openings already occurring on 3rd and 4th October from VK5 to VK1, 2, 4 and 6. More details next month.

Please remember to send any 6 m information to Brian VK5UBC at bcleland@picknowl.com.au.

2 m & 70 cm FM DX

Leigh Rainbird - VK2KRR

Conditions were fairly ordinary during September for Australian operators, though toward the end of the month, conditions did pick up in VK4.

Tropo duct openings reported for September occurred in VK4 on – 5th, 14th, 15th, 21st, 28th, 29th and 30th, and in the south east of VK on – 5th, 6th, 7th and 20th.

Mike VK4MIK worked to VK4RDC Hayman Is, 451 km; VK4RHR Hodgson Range, 640 km. Felix VK4FUQ made trips also to those repeaters and Mackay.

John VK5PO worked Leigh VK2KRR on simplex, 738 km. Brian VK5UBC portable southern Yorke Peninsula worked to Mt Macedon, Ararat, Warrnambool, Ballarat, Grampians, Bordertown, Naracoorte and Mt Gambier.

Start of October has seen some nice long contacts in Queensland, but more on this next month.

Long Distance Competition

The 05/06 Long Distance Competition has been running for 3 months now and there has been some interesting action for those following the progress.

It was suggested that a 50 MHz category be included, this has now been implemented, though no contacts submitted at this stage.

In the 144 MHz category, most contacts logged at this stage are for inland tropo between VK2 and VK5. Furthest distance being a contact between VK5UBC and VK2KRR at 914 km between Corny Point and The Rock. Some tussles in the EME area between VK4CDI and VK2KRR.

On a state level, the VK5 area should see some interesting loggings in the next few months with VK5UBC and VK5PO trading places a number of times already.

432 MHz and 1296 MHz are the only other bands with contacts submitted. The higher up frequencies have been quiet at this stage.

Only VK5UBC and VK2KRR submitted logs for 432 MHz. Again inland tropo being the category. A good bout of 70 cm conditions will see some good movement here.

Onto the FM DX categories and we're seeing some great action on a national level but fairly one sided on a state by state basis.

On the 146 MHz FM national level, distance records originally held by VK5PO and VK2KRR for FM simplex (FMS) and FM repeater (FMR) contacts has recently been smashed by contacts logged by Mike VK4MIK and Mike VK4JOO. The two Mikes currently are joint holders of FMS#1 of 923 km and VK4MIK holds FMR#1 of 951 km. This tops the previous records by around 200 km.

On a state level, we see a great effort by Hayden VK7HAY, whose portable efforts have netted him top 3 spots in the VK7 division and just missed out on a national listing.

Low activity levels prevail in the 438 MHz FM section with only 2 FMR contacts logged. FMR#1 is VK5UBC with 308 km and FMR#2 is VK4MIK with 244 km.

Good luck to all.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au

ar

Over to you

Boring? Hardly

I am writing in response to the column entitled "Are we boring you?" which appeared in the Editorial Comment section of AR Volume 73 No 10, October 2005.

As a new amateur (so new in fact that I'm still waiting for the licence certificate) I would like to say that far from finding rare DX, QSL card collecting, ridiculous pointless contests and Morse code boring that in fact I find these all to be very interesting core elements of the hobby.

Rare DX is the exciting challenge ahead, QSL cards are a fun way of documenting achievement in meeting the DX challenge, Contests should be neither ridiculous nor pointless when they serve to hone on-air operational skills, fine tune equipment and/or station set-up and as for Morse, that highly contentious mode, it may come as a surprise to some that this new amateur is extremely keen to become proficient in this mode. Because, even with my limited experience, it seems obvious that when band conditions are awful and the only equipment you have access to is something you knocked together in the garage then Morse will work like nothing else will.

Now these are just some of *my* interests and no two people will be identical in this regard. The strength of amateur radio is the fantastic array of different but related technologies, modes and activities that can be explored and the diversity of people that this brings together.

Just so those who are interested can pigeonhole my demographic I'll be 39 years old this October, which makes me older than some and lot younger than others! But I don't feel that my interests are necessarily unique to my age group and above (or below). Reading posts to Ron Bertrand's (VK2DQ/4), "Radio & Electronics School" bulletin board from both past and current fellow students shows an active interest in most if not all of the above, and yes that includes Morse! This interest is coming from many who I judge to be much younger than myself, by virtue of still being at high school or university.

So do I find it boring? Hardly!

Viva La Amateur Radio!

73 Steve VK2HHP

PS. I'd also be very interested in any article someone cares to write on 2.4 GHz digital data networks. Just because I still find the above interesting does not mean I find the newer technologies less so.

ar

The WIA President addressed the new amateur licence structure and the WIA assessment system, particularly in relation to the Foundation licence. He stressed that everyone was still learning and testing the protocols that had been developed and these were being modified in the light of experience.

Michael said that he knew that a number of clubs needed more WIA Assessors qualified and had asked when further assessor training courses would be conducted. The WIA would certainly conduct a further assessor course in the reasonably near future, though he did not know when and where the course would take place. "I ask all WIA affiliated clubs, who wish to nominate people for qualification as WIA Assessors to complete the forms and send them to the WIA national office, so we can evaluate the best way of meeting this need."

First BPL interference complaint submitted by a Tasmanian amateur.

The Aurora BPL trial has been activated in Mt Nelson, a suburb of Hobart currently without competitive broadband assess.

Conrad, VK7HCK, has lived in the area with his family for a few years and is an active HF operator. Conrad is experiencing over S9 interference levels on HF bands with the highest interference level (S9 + 40dB) on 80 metres. The level of BPL interference has effectively prevented Conrad from operating on HF.

On his own initiative, Conrad has lodged an interference complaint with ACMA and also with Aurora Energy and is waiting to see what action they will take to remove the interference.

WIA Amateur Radio Bookshop open for business

The WIA Amateur Radio Bookshop is now open for business. A Catalogue (V 1.10) is available and entry is via the bookshop tab on the left hand column on the home page of the WIA website.

Those who order the 2006 ARRL Radio Communications Handbook will receive a beautifully reprinted copy of the 1926 ARRL Handbook free!

The range is small as this represents the current inventory. More titles will be available in the coming months. It is hoped that the WIA Amateur Radio bookshop will be carrying RSGB titles soon.

Podcasting a great success for the WIA National News

Recently Grant, VK3HFS, announced that the VK1WIA National News was available as a podcast download each week.

Server statistics show that in excess of 150 people per week are now getting the news as a podcast! In addition last week some 552 people received the news from the mp3 files.

VK4SS makes generous donation

Al Shawsmith, VK4SS, one of the original Australian radio amateurs, and one of amateur radio's greats, now 90 years old, presented the WIA with a cheque for $10,000 on Saturday, 22 October 2005.

WIA President, Michael Owen, VK3KI, accepted the cheque on behalf of the WIA, saying that he was accepting it on the basis that Al's wish that the money would be used for educational purposes or in support of WIA educational activities would be fully respected.

Michael thanked Al on behalf of all radio amateurs, saying that he was deeply moved by this thoughtful and generous gesture.

ar

My even further experiences with DSB QRP

Graeme Wilson VK6BSL

I moved to Perth in 1989 and have taken my homebrew DSB QRP rig (about which I wrote two articles for the New Zealand Magazine Break In) when going back to New Zealand for a couple of trips. I have used the little rig continuously since then, and here is an update.

The rig is in three basic parts and was initially built in 1988 (I won the Single Operator Division of the NZART National Field Day contest running two watts that year). The rig also won the homebrew competition at the 2002 Hamfest..

The VFO is a circuit from page 36 of the ARRL publication Solid State Design. It is extremely stable and is separately boxed.

The receiver is the Break In "Alivo" designed by Fred Johnson ZL2AMJ using an NE602, then a BC549, then an LM386.

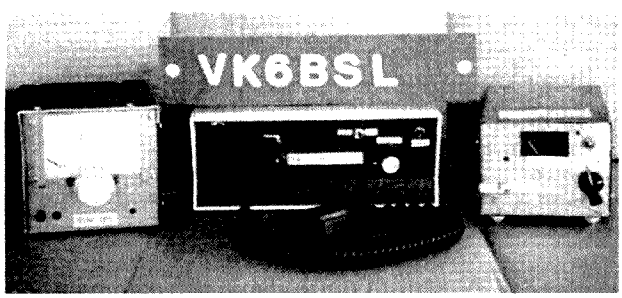


Photo 1 – From left to right, the VFO, the DSB transceiver, and the linear and SWR metering.

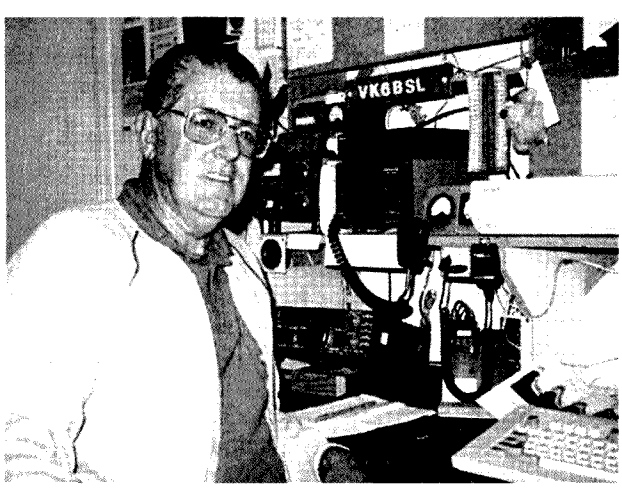


Photo 2 – Graeme VK6BSL in his 'shack'.

It can hear most of what my Kenwood TS140 hears but is quieter!

In the same box is the mike amplifier from page 202 of Solid State Design. The mixer and RF amplifier are from ZL2BMI using a BC549 then a BD139.

The small 4/5 watt linear (Drew Diamond design) is in the third box with a SWR metering circuit. Most of the circuits were on PCBs to my design as in *Amateur Radio*, July 1999, page 47.

With an 80 metre dipole never more than six metres high, fed with 300 ohm ribbon, I have worked all of New Zealand when there. From Perth I have worked VK 2, 3, 4, 5, and 7 and it is in use most Sundays on the WIA broadcast with excellent reports of clarity and stability.

By the way, thanks to all the operators who stretch their ears and work me, particularly when conditions aren't good for QRV. I have rarely -worked any other "home-brew" rigs in the past, 20 to 30 years. Shame, shame. (Keep up the good work, though, Drew!)

I am pleased that I can repair this rig if it develops a fault, although that very rarely happens. In August 2003 I completed a 40 metre copy but all in the same cabinet and with RIT. This goes very well and was "highly commended" at last years Hamfest.

ar

AMSAT

Bill Magnusson VK3JT

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

Disappointment for the SSETI team

In late September we received the disappointing news that the launch of SSETI had been delayed. The delay was caused by one of the spacecraft on the launch, "SINAH", having suffered a significant failure and not being ready to fly. Early indications suggest that the launch would be delayed for at least one month. Then early in October Graham Shirville G3VZV announced that the launch had been re-scheduled for Thursday 27th October from the Plesetsk Cosmodrome - with 28th October as a back-up date. The launch time is still expected to remain at 06:52:26 UTC. Let's hope that by the time you read this we have SSETI up and running. A google search for "SSETI" will lead you to the web site and the latest information regarding the state of the launch campaign, frequencies, etc.

Some thoughts on satellite ranging experiments

It's been said that amateur radio satellites offer something for everyone. You may simply be interested in chatting or hunting new states or countries or collecting "grid-squares". Telemetry demodulating, decoding and display may grab your interest, or maybe APRS positioning. Perhaps the technical challenge of doing it all on a limited budget appeals to you.

One unusual topic has been under discussion on the AMSAT-NA bulletin board recently. "Satellite Ranging". Although this activity has been the province of control stations for ages the advent of global positioning (GPS) satellites and the ability to link them to APRS on some satellites has brought it into sharper focus for the average user. In its simplest form you send out a short duration pulse from your transmitter and receive the re-transmitted pulse via the satellite's transponder. By accurately recording the time difference between the two pulses either in software or on an oscilloscope a remarkably good estimate of the range (distance between you and the satellite) can be made. By watching the changes in the value of the range it is even possible to establish a crude set of "keps" for the satellite - if you have the appropriate software. As usual the "gurus" are watching the BB discussions and James Miller bowed in with this response.

"Yes. All Amsat P3 satellites had/have ranging capabilities. Either the flight computer could regenerate and return a 400 bps signal, or a transponder could return anything. The resultant range measurements were used to determine the satellite's orbit, and will do so again for P3E. When AO-40 was working you could send pulses through the transponder, and watch the changing delay. Pulse-at-a-time measurements are of course noisy, and you can do far better by sending a rapid stream of pulses. These can be faster than the round-trip time allows if you make the pulses a unique stream of +pulses and -pulses, which manifests itself as a quasi-random data stream. With this you can, with suitable mix of hardware and software, get both uplink pulses and downlink pulses "into" a computer and do all the time to range conversion automatically to remarkable accuracy (sub km)".

An article about this is at: http://www.amsat.org/amsat/articles/g3ruh/123.html.

So there you are – another interesting facet of amateur radio satellite activity for your consideration.

New South African Satellite

South Africa, in collaboration with other African Nations is to build a network of LEO satellites. AMSAT-South Africa has been involved in discussions with the Department of Science and Technology to include an amateur payload to serve the needs of Amateurs on the African continent. *"Now that the announcement has been made we will intensify our discussions with the various role-players"*, President, Hans van de Groenendaal ZS6AKV said. He added, *"At this time I call on radio amateurs to send in ideas of what payload they believe will serve the African Amateur Radio Community best"*.

The full story can be seen at: http://www.southgatearc.org/news/october2005/sa_satellite.htm.

It's obvious from the above that the satellite will be designed with South African amateurs in mind but whether this means it will only be switched on over South Africa is not clearly indicated, even on the web site. We'll have to wait for more information on this one. If it's part of a large constellation of satellites then maybe it will have to observe general power budget constraints across the whole constellation, which could put it out of action for much of each orbit in similar fashion to AO-27. Time will tell.

Deployment of "Suitsat" draws nearer

As the time for deployment of Suitsat comes closer (December 2005) it would do well to look at the history of this project. Here is a summary from the AMSAT archives.

On Thursday September 8 at 13:08 UTC, Progress 19P lifted off from the Baikonur Cosmodrome in Kazakhstan. Included in the 2.5 tons of fuel, food and supplies are two Amateur Radio on the International Space Station (ARISS) systems – the Suitsat amateur radio hardware and the Slow Scan Television (SSTV) hardware and software.

The successful docking of Progress to ISS on September 10 culminates the successful design, development, certification and delivery of these two ARISS Projects. The ISS Expedition 11 crew will unpack this equipment, making it available for installation, use and deployment by the Expedition 12 crew.

The Suitsat amateur radio system, coupled with a school artwork project, is planned to be installed in an outdated Russian Orlon spacesuit. It will then be deployed from the ISS during an Extra Vehicular Activity (EVA, or spacewalk). This is expected to occur in the December timeframe by the Expedition 12 crew.

The Suitsat amateur radio system will beam down special messages and an SSTV image from within the Orlon space suit as it floats in space. Suitsat radio system will allow hams and students to track the suit and decode special international messages, space suit telemetry, and a pre-programmed Slow Scan TV image through its specially-built digital voice messaging system and amateur radio transmitter. As built, Suitsat will be a transmit-only capability that will run on the space suit's battery power.

As part of the Suitsat project, a CD with hundreds of school pictures, artwork, poems, and student signatures is included. Two identical CDs were flown, one will go in the suit and the other will be for the crew to review.

Using the crew CD, we hope to downlink these images using the SSTV system that will be located inside the Service Module once it is operational. There are approximately 300 items on the CD. These are from all over the world (Japan/Asia, Europe, Russia, Canada, US, South America and Africa).

Several NASA Explorer Schools participated as well as numerous ESA and Russian Space Agency-sponsored schools. The idea for Suitsat was first conceived by the ARISS-Russia team, led by Sergey Samburov, RV3DR, and was extensively discussed at the joint AMSAT Symposium/ARISS International Partner meeting in October 2004.

The project, also called Radioskaf or Radio Sputnik in Russia, is being led by project manager A. P. Alexandrov and Deputy Project Manager A. Poleshuk from RSC Energia, located in Korolev (Moscow area) Russia. On the US side, the hardware project development was led by AMSAT member Lou McFadin, W5DID.

Since October 2004 the Suitsat design concept matured and evolved due to the challenging development time constraints. In a very short timeframe, the ARISS international team designed built and tested a simple, yet fully featured system that we hope will inspire hams and students around the world.

The SSTV system will be installed inside the Service module as an integral part of the ARISS ham radio system. It will transmit and receive (JPG) still images from the International Space Station in a format called Slow Scan TV (SSTV).

When fully operational, the SSTV system is capable of sending up to 480 images per day from ISS. It will also be able to receive images from amateur radio stations on Earth. This system will utilise the already installed Kenwood D-700 radio and the ARISS antennas mounted on the Service Module.

The SSTV equipment flown on Progress 19P includes the SpaceCam software, a radio/computer interface module, and data cables. The dedicated laptop for SSTV operations will be launched on a subsequent Progress vehicle.

Over the course of the past several months, the Suitsat and SSTV system passed the stringent NASA and Energia safety certification process and were deemed ready for flight, clearing the way for the incorporation into the Progress 19P vehicle.

More information on SSTV and Suitsat will be provided as we get closer to installation and deployment. The above information was provided for the AMSAT-NA web site by Frank H. Bauer, KA3HDO ARISS International Chairman.

ar

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

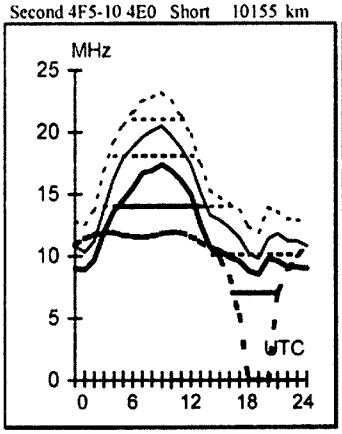
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

November 2005
T index: 21

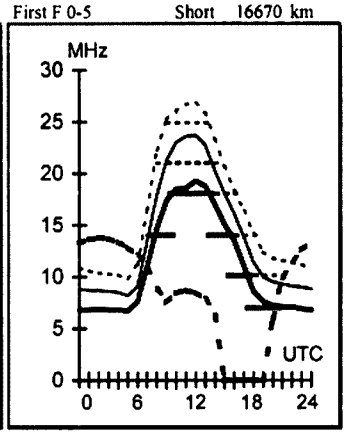
Legend

Frequency scale
UD
E-MUF
OWF
F-MUF
ALF
>10%
>50%
>90%
Time Scale

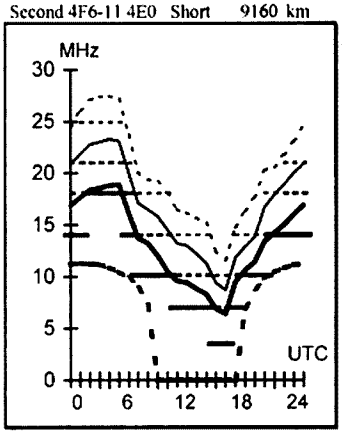
Adelaide-Capetown 226
Second 4F5-10 4E0 Short 10155 km



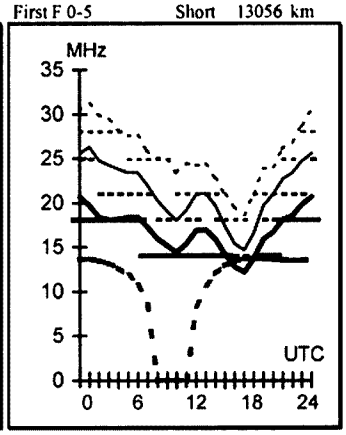
Brisbane-Dublin 335
First F 0-5 Short 16670 km



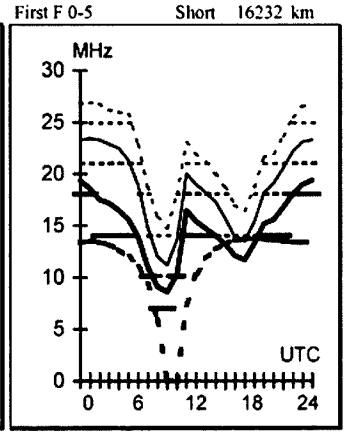
Adelaide-Honolulu 57
Second 4F6-11 4E0 Short 9160 km



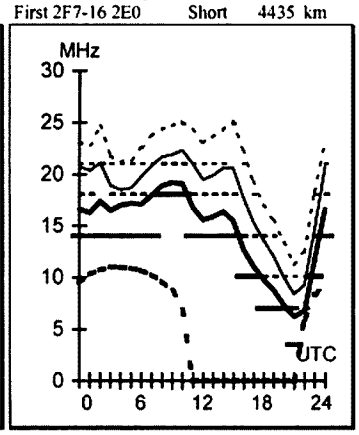
Brisbane-Lima 122
First F 0-5 Short 13056 km



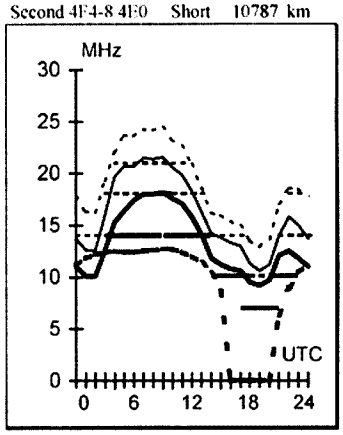
Canberra-Barbados 123
First F 0-5 Short 16232 km



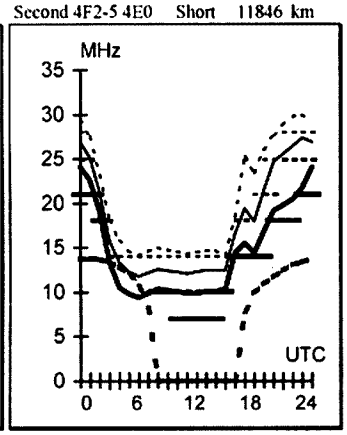
Darwin-Bangkok 310
First 2F7-16 2E0 Short 4435 km



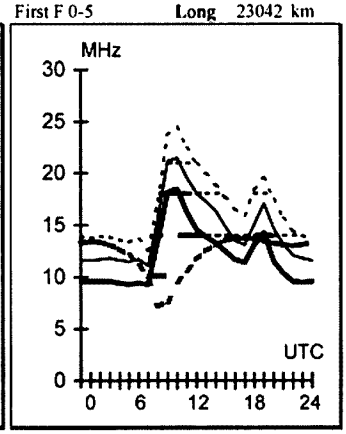
Adelaide-Lusaka 246
Second 4F4-8 4E0 Short 10787 km



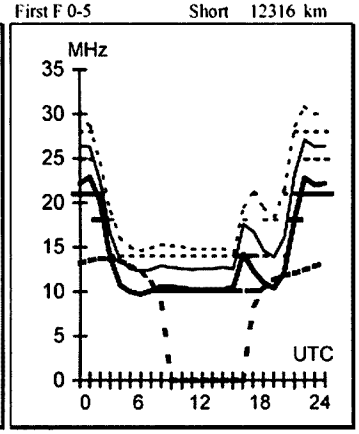
Brisbane-Seattle 44
Second 4F2-5 4E0 Short 11846 km



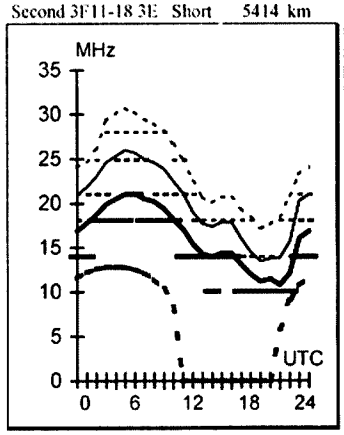
Canberra-London 136
First F 0-5 Long 23042 km



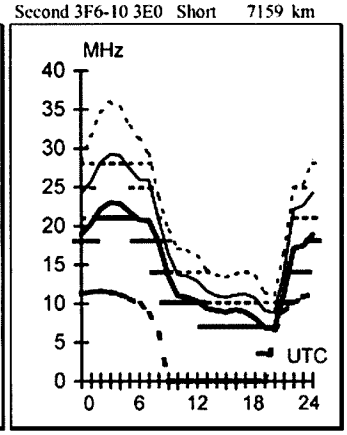
Darwin-San Francisco 54
First F 0-5 Short 12316 km



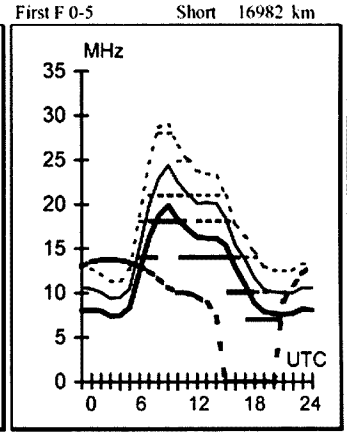
Adelaide-Singapore 311
Second 3F11-18 3E Short 5414 km



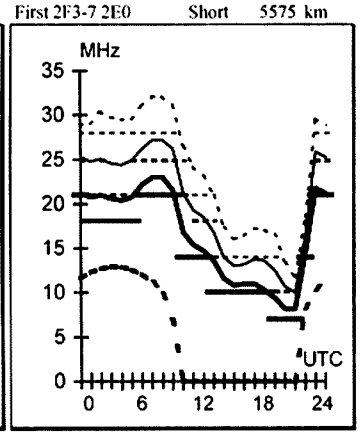
Brisbane-Tokyo 348
Second 3F6-10 3E0 Short 7159 km



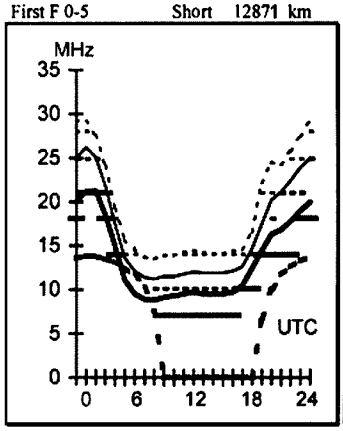
Canberra-London 318
First F 0-5 Short 16982 km



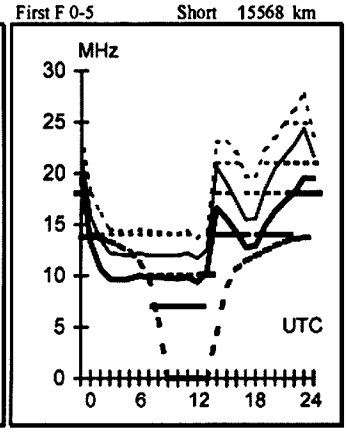
Darwin-Seoul 356
First 2F3-7 2E0 Short 5575 km



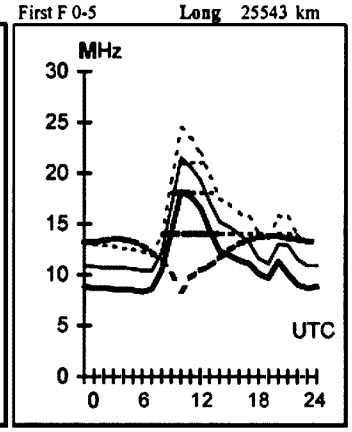
Hobart-Anchorage **28**
First F 0-5 Short 12871 km



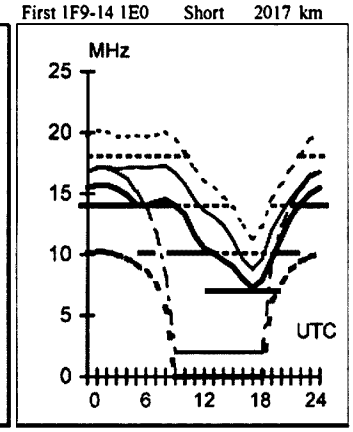
Melbourne-Chicago **67**
First F 0-5 Short 15568 km



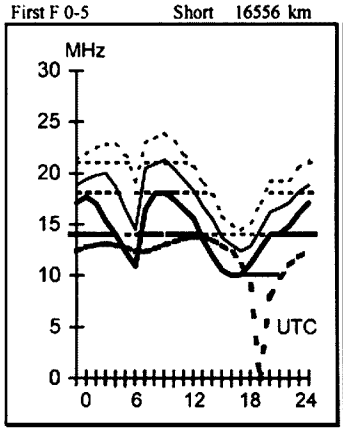
Perth-London **133**
First F 0-5 Long 25543 km



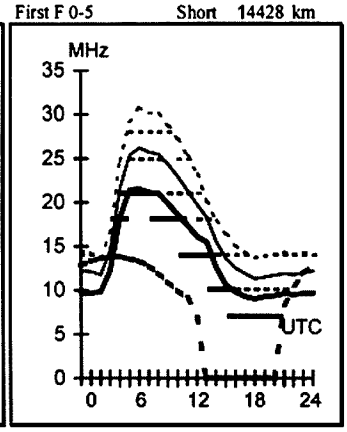
Sydney-Invercargill **139**
First 1F9-14 1E0 Short 2017 km



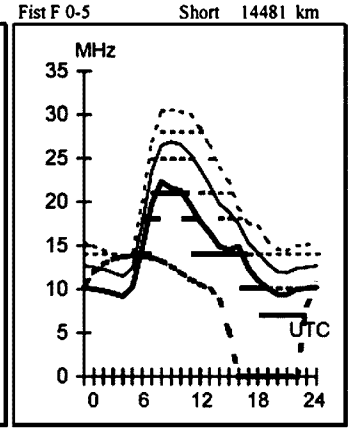
Hobart-Dakar **209**
First F 0-5 Short 16556 km



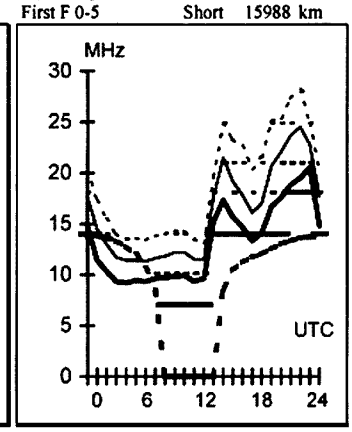
Melbourne-Moscow **316**
First F 0-5 Short 14428 km



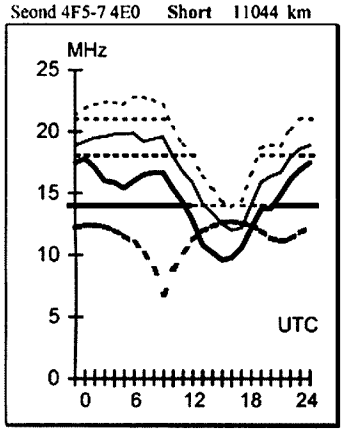
Perth-London **313**
Fist F 0-5 Short 14481 km



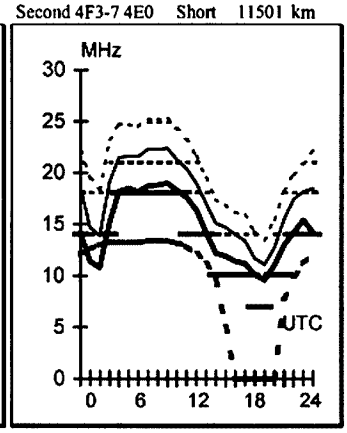
Sydney-New York **66**
First F 0-5 Short 15988 km



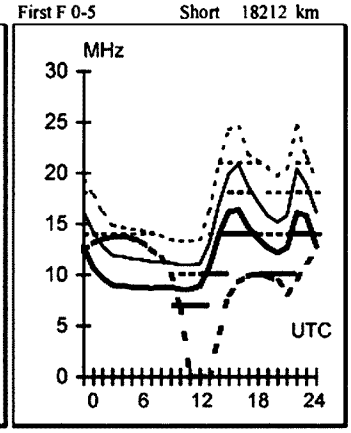
Hobart-Montivideo **161**
Seond 4F5-7 4E0 Short 11044 km



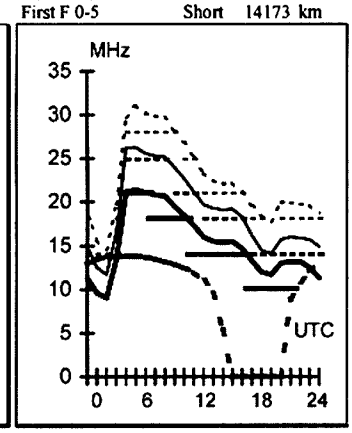
Melbourne-Nairobi **258**
Second 4F3-7 4E0 Short 11501 km



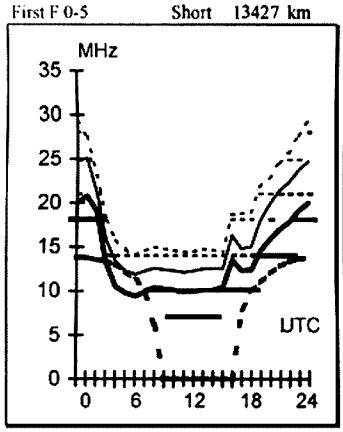
Perth-Ottawa **30**
First F 0-5 Short 18212 km



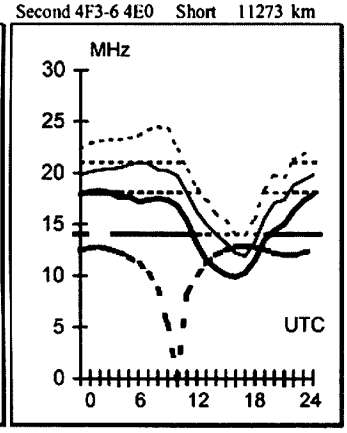
Sydney-Tel Aviv **287**
First F 0-5 Short 14173 km



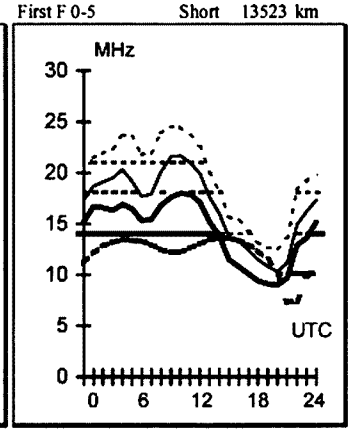
Hobart-Vancouver **49**
First F 0-5 Short 13427 km



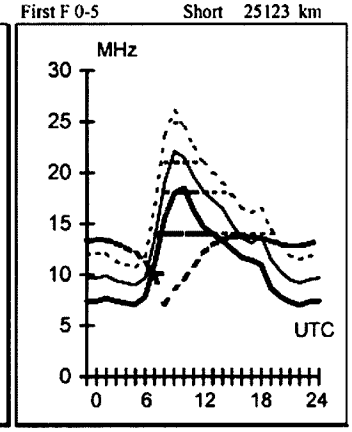
Melbourne-Santiago **150**
Second 4F3-6 4E0 Short 11273 km



Perth-Rio de Janeiro **203**
First F 0-5 Short 13523 km



Sydney-St Petersburg **143**
First F 0-5 Short 25123 km



Hamads *classifieds* FREE

FOR SALE NSW

• Vertical antenna CHA250B 3.5 to 57 MHz, no radials, as advertised in AR. Virtually never used - not allowed in retirement village. $650. David VK2BDT 02 4821 5036

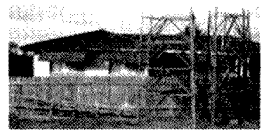
• Marconi auto tune FM/AM modulation meter TF2304 s/n 169711/027, original handbook $230. John VK2BJU 02 4841 0272 or demerland@goulburn.net.au.

• Shack clearance, VK2KVJ Cyril: Kenwood TS-830S x/ceiver 240volt 1.8 to 30 MHz; Kenwood TS-180 ant tuner; Kenwood TR-2400 2m FM x/ceiver handheld; Kenwood VB-2200A 2m FM power amplifier; Alinco model DR119 2m FM mobile with hand mike; Phillips FM900 x/ceiver converted to 2m FM; Yaesu FRG-7 communications receiver HF 0.5 to 30 MHz; Trio model 9R-59DS communications receiver HF 0.5 to 30 MHz; Midland HF power/swr meter; SEIKO Transistor 24 hour World Time Clock; Baycom modem; PMG morse key 8 AMP No 2 (1942); Antenna switch 4 position model D-5204; Sony Stereo tape recorder model TC 540 (solid state); ***ARRL Antenna Book 16th edition; 1975 Radio Amateur's Handbook; 1993 Passbook to World Band Radio; 2001 World Radio and TV Handbook. All items are open to reasonable offers.*** Contact Ron 02 9525-8035 or email vk2gps@hotmail.com.

• Yaesu FRG 7 communications receiver, VGC, S/N 6 MO 61926, $80; Yaesu FT 720RV 2 metre transceiver, removable front, with cradle, remote cable, manual, VGC, S/N OI 060774, $175; Kenwood HF Transceiver, TS 50S, as new, operating and maintenance manuals, S/N 41122062, current model, $700; all ONO; Keith VK2AXN, QTHR, Sydney, kandpa@bigpond.com.

• SHACK CLEARANCE: Yaesu FT-100D hardly used, with separation kit YSK-100, complete $1400. Yaesu FT-290RMkII with Yaesu FL-2025 linear amplifier,mobile cradle,complete $390. Yaesu FT-90R dual band with YSK-90 separation kit, complete $395. Yaesu FT1500M 2m mobile, impeccable, complete $300. Alinco DR-590 dual band in very good conditions $230. Mirel VK2BOD. Email adslqls8@tpg.com.au, Phone 02 4333 1823

• Tower 50ft, triangular heavy duty tower



made from heavy duty BHP Steel construction in 6 x 8'6" lengths + centre pipe. Each section cross braced for extra strength. Galvanised – no rust. Capable of holding VERY LARGE antennas. Comes with extremely heavy duty footings made from 1" plate steel and hinged. The tower is currently dismantled to its 6 parts and is located in Lawrence NSW. An 8 x 5 HD trailer is required to transport. Must sell – house sold. Cost $350.00 ONO You couldn't buy the steel for this price! Ph 0427 250 005, Max VK2KLW

WANTED NSW

• Kenwood AT-230 antenna tuner. Similar unit would be considered. Ken, Phone 02 6331 3335

• Self-supporting wind-up and tiltover tower for large HF beam. Heathkit RX-1 receiver and Hallicrafters SX-111. Greg Price VK2GWP QTHR vk2gwp@bigpond.com.au, call Greg on 02 4958 1541

FOR SALE VIC

• Early model TVs, Astor SJ & HSQ, Kriesler 121, Philips 71, Rank Arena C2601 & C2605 for a collector to pick up as freebees or they go to the tip. Bill VK3ZWO, Sandringham, 03 9598 6304.

• Deceased Estate: AOR AR7030 0-32 MHz all modes, S/n: 101410 fitted extra HQ Murata 1 kHz, 4 kHz, total 6 filters, manual, new battery, PC data cable $1,239 ($2,105). AOR AR8200 mk 2 wide range receiver in box S/n: 078011 $649 ($1,090). RF Systems DX-Oneant. $635 ($1,150) all EC. TET-Emtron HF Dipole ant. 7,14,21,28 MHz 1 kW $155, Kenwood ant. tuner AT-230 $55 all GC. Call Mark on 03 9755 7295. Mobile: 0412 821 694 email: e-service@tpg.com.au

FOR SALE SA

• GX2000 UHF mobiles 25W suit 70cm, several available, $199. Bruce VK5VK 08 8298 3906, email rfwizard@optusnet.com.au

WANTED WA

• Wanted Kenwood TS850s, late model, preferably with narrow CW filters and DSP100 accessory. Good condition only. Contact Phil, VK6ABL, phone 0419 136 066, email:-flinders@gidgenet.com.au

WANTED TAS

• The Silicon Chip "Universal Power Charger" described in the June & July 2001 magazine. Providing the item is in good electrical & physical condition, I'll pay the required cost & postage. Mike VK7KMH QTHR Ph 03 6425 6380 anytim during the day till 2100hrs

WANTED MISC

• Circuit diagram and layout of boards for VHF/UHF FM test set AH12 AWA. Jacques Brunet F/VK5ZJB, 993 Route des Gallinieres, Connelle/Vernay, France 42120.

THE WIA QSL COLLECTION REQUIRES QSLS.

All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

About hamads....

- Hamads may be submitted by email (preferred) or on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are prepayable at $26.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each Issue of Amateur Radio.

Email: *newunltd@bigpond.net.au*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793.* **Fax:** *03 9756 7031*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

ADVERTISERS INDEX

AEI....26
Andrews....29
Banalsc....IFC
Clarke....50
Com-an-tana....49
TET-Emtron....23
G & C....9
Icom....OBC
Ozgear....17
TTS....16
Small ads....55
VK Discounts....55
VK Books....33
Winlink....34
www.vk3ajj.com....55

VK DISCOUNT CABLES

The RF Specialists

SUPPLIERS, IMPORTERS & MANUFACTURERS

Servicing All Commercial & Amateur Radio Applications & RF Industries

ABN: 82 117 006 496

SPECIALISING IN

- RG SERIES COAX
- ULTRAFLEXIABLE COAX
- HELIAX CORRUGATED HAROLINES
- WAVEGUIDES & SEMI-RIGID
- HI-TEMP TEFLON COAX
- DATA CABLING & Accessories
- 450 & 300 OHM LADDERLINES
- MULTI-CORE CONTROL CABLES
- ALL COAX / HARDLINE CONNECTORS
- HARD DRAWN & SOFT DRAWN COPPER WIRE
- ENAMELLED COPPER WIRE
- SCOTCH TAPE PRODUCTS / CABLE TIES
- CERAMIC AND PVC INSULATORS
- FLAT EARTH BRAID
- HEATSHRINK TUBING – All types and sizes
- DACRON & KEVLAR UV ROPES
- MOBILE ANTENNAS – Stainless & fiberglass construction
- DIPOLE & WIRE ANTENNAS
- LIGHTNING PROTECTION
- *SERVICE TO – GOVERNMENT, MEDICAL, MARINE, BROADCAST & DEFENCE SERVICES.*

TECHNICAL DATA AVAILABLE ON REQUEST.
CABLE SAMPLES AVAILABLE ON REQUEST.

We also supply professional pre-assembled cable assemblies of any length, with any connector, for any job !
Have your installation look commercial & professional with Custom manufactured wall plates to order!

OUR WARRANTY

All RG cables & assemblies, hold a 6 year warranty.
12 year warranty. on all Times LMR & Hardline cables & assemblies

- 300 & 450 OHM LADDER LINE from – $1.00 p/m
- RG-213 MIL-C-17D - $145.00 per 100m
- RG-58CU MIL-C-17D - $50.00 per 100m
- Bel-9913 Equiv – $3.90 p/m
- 1/4 inch HELIAX - $4.00 p/m
- 1/2 inch HELIAX - $4.95 p/m
- 7/8 Inch HELIAX - $0.95 p/m
- 5,7 & 8 core Control Cable from $0.90 p/m

(All cables Available in 100m, 500m & 1000m qty)

- 2KW 1:1 & 4:1 BALUNS from $50.00 EA
- 2KW YAGI BALUNS HF/VHF from $50.00 EA
- DIPOLE CENTRES with SO239 - $15 ea
- LADDERLINE CENTRES - $20 ea
- CERAMIC EGGS from $1.00 EA
- AMERITRON RCS-8VX - $319
- AMERITRON RCS-10VX - $339
- *ALPHA, HENRY, MIRAGE & AMERITRON LINEAR AMPLIFIERS – TO ORDER*

MFJ ANTENNA TUNER CLEARANCE

WE ARE OVERSTOCKED!

- MFJ-986 3Kw Roller - $519.00
- MFJ-962D 1.5Kw Roller - $440.00
- MFJ-993 300w Auto – $479.00
- MFJ-949E 300w Deluxe - $249.00
- MFJ-945E 300w HF+6 - $179.00
- MFJ-904H Tiny Tuner - $249.00

Receive a Free Hi quality patch lead with every ATU sold !

All *HEIL* MICROPHONES and ACCESSORIES

- PROSET HC4 / HC5 - $249.00
- PROSET IC - $269.00
- PROSET PLUS - $289.00
- GOLDLINE GM4 & GM5. - $249.00
- HM10 DUAL - $249.00
- HM10/5 - $139.00
- HM10/4 - $139.00
- FS2 PTT FOOTSWITCH - $85.00
- HS2 PTT HANDSWITCH - $65.00
- TRAVELLER-ICOM - $169.00
- TRAVELLER-KENWOOD - $159.00
- TRAVELLER-YAESU - $159.00

Receive required AD1 adaptor at half price with every PRO-Headset sold, valued at $30.00
Receive required CC1 adaptor at half price with every GM and HM mic sold, valued at $54.00

DAIWA & MFJ SWR & Power Meters

Receive a Free Hi quality Patch lead with every SWR Meter sold.

ALL ABOVE SPECIALS FOR NOVEMBER ONLY
FREE CATALOGUE AVAILABLE

Make us your last call, as we will be your first choice on Service, Technical advice and the best possible price !

PAY BY – MASTERCARD, VISA, BANKCARD

Prices subject to change without notice. Prices inc. of G.S.T.

Trading Hrs: Mon – Fri 8am – 530pm
Sat – 8am – 12 noon
Office: (02) 48 622110 BH

EMAIL: rob_vk2xz@hotmail.com

WEBSITE COMING SOON.

ROB LONG, Director Office: +61-2-4862-2110 BH

EMAIL: rob_vk2xz@hotmail.com

WEBSITE COMING SOON

AMIDON FERROMAGNETIC CORES

For all RF/electronic applications.

See our website for complete data on all cores including prices.

www.catchnet.com.au/~rjandusimports

RJ & US Imports

PO Box 431, Kiama NSW 2533.

A 3.5" PC disk containing all data is available for $5.00 incl. post.

Agencies

Active Electronics, Tas
TTS Systems, Tyabb (VIC)
Tower Communications, Perth
Ozhelp Services, Brisbane

HF, VHF, UHF ANTENNAS & ACCESSORIES

Aluminium towers, guys etc

Diamond VSWR/PWR meters.

HD copper antenna wire & insulators, TX tubes & pwr transistors, full range Create Rotators

Quality coax cables & connectors. Free advice & catalogue.

ATN Antennas

Ph 03 5492 2224 Fax 03 5492 2666,

email atnant@iinet.net.au

PO Box 80, Birchip Vic 3483

JACKSON BROS

JACKSON OF THE UK IS BACK

Highest quality products made by UK craftsmen

Full range now off-the-shelf in Australia.

Variable and trimmer capacitors, reduction drives, dials, ceramic standoffs

CATALOGUES, PRICE LISTS AVAILABLE

CHARLES I COOKSON PTY LTD
11-13 Port Rd
Queenstown SA 5014

Tel: (08) 8240 3200 Fax: (08) 8240 3233

FreeFax 1800 673355 within Australia

Email: jackson@homeplanet.com.au

ALL MAJOR CREDIT CARDS ACCEPTED
SOLE AGENTS AUSTRALIA AND NEW ZEALAND

Tunable Loop Antenna enhances AM Reception

AM radio reception (530 to 1900KHz) enhanced. Reception where none existed before; works indoors, **even in interference-polluted areas**

High value — low cost.

Simple, no connections or batteries Ideal for touring, caravan, boat and fringe areas. Use anywhere.

www.amradioantennas.com
pkloops@bigpond.net.au
Paul 0412 302 939

PK's Loop Antennas

RADIOS:

	Unused	*Used*
Icom 706MK2G	Ring/email	$1199
Icom 208H	$ 550	$ 499
Icom 910H	$1999	$1699
Icom 756PRO2	N/A	$2799
Icom 756PRO3	$4499	N/A
Kenwood TS2000	$2699	$2299
Kenwood TS2000X	$3599	N/A
Kenwood TS480SAT	$1899	$1599
Kenwood TS480HX	$1999	$1699
Kenwood TS570DG	N/A	$1399
Kenwood TMD700A	$ 849	$ 799
Kenwood THD7A	$ 599	$ 549
Yaesu FT8900R	$ 649	N/A
Yaesu VX7R	$ 549	N/A
Yaesu FT1000MP MKV	$3599	$3199
Yaesu FT1000 Field	$3199	$2799
Yaesu FT847	N/A	$1799
Yaesu FT857D	$1249	$1149
Yaesu FT897D	$1299	N/A
Yaesu FT100D	N/A	$1199

ACCESSORIES:

Doss 40 AMP PSU	$ 225	N/A
Icom AH4 ATU	$ 489	$ 425
Icom AT180	N/A	$ 499
Tokyo HL700B HF Amp	$1899	
Tokyo HL200V50 2M Amp	$ 649	
MFJ 993 ATU	$449	

Call / email re Heil and MFJ products

DOA warranty applicable on all items (ie if it is not 100% and in condx as described, a full money back g'tee applies)

OTHER CURRENT MODELS AVAILABLE

ALL USED GEAR IN EXC CONDX WITH ORIGINAL BOX AND ACCESSORIES

PRICES SUBJECT TO CHANGE - CHECK WEBSITE FOR LATEST (OR RING)

WILL CONSIDER TRADE-INS - BUT MUST BE CURRENT MODEL GEAR (IE LAST 5 YEARS)

Ship anywhere in VK/ZL (freight extra)

ORDER ONLINE AT

WWW.VK3AJJ.COM

OR TELEPHONE PAUL ~
(03) 9018 9757
Mob. 0410 093 759
vk3ajj@iinet.net.au

NB - I am not an authorised dealer for the radio companies listed above. These companies may refuse service on equipment sold by me - but other servicing options are available in the VK market.

Licensed Second Hand Dealer NO 10229 (Vic)

WWW.VK3AJJ.COM - giving Aussie Hams a FAIR GO!

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: ★ **$ 75 for full members (F grade),** ★ **$ 70 for pensioners and students (G and S grade), and** ★ **$ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Reichelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.reichelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6OO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

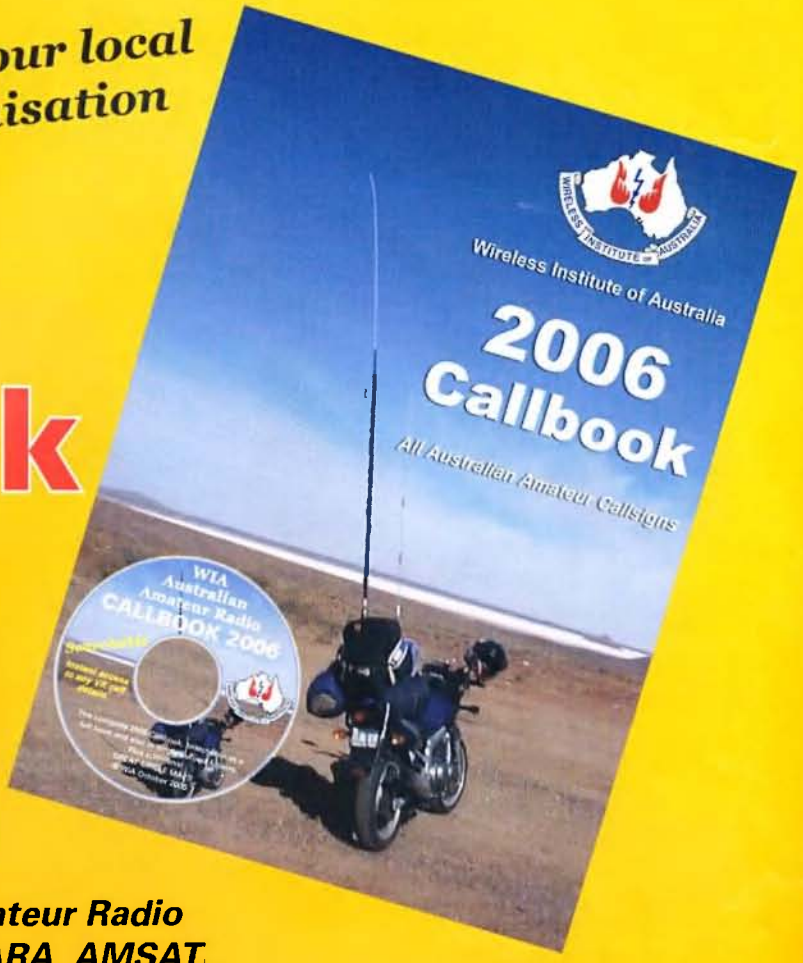
Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

Now available from your local Amateur Radio Organisation

2006 Callbook

All Australian Callsigns



Plus great detail about:

The new WIA, Amateur Radio Clubs, WICEN, ALARA, AMSAT, ARDF, Band Plans, Beacons, the ACMA, Examinations, QSLs, Great Circles, Maidenhead, DXCC, Packet Radio, Repeaters and more.

How to get your copy:

Contact your local Amateur Radio Club or WIA National Office
03 9528 5962 nationaloffice@wia.org.au

Prices from National Office

	Pick up	Posted
WIA member	$22	$25
non-member	$30	$33

ICOM'S PRICE BREAK THROUGH

MOST AFFORDABLE PRICES EVER

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706

Now includes 70cm @ 20W and 50W on 2m Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-2200H

High (65W) Power Output • DTCS & CTCSS Tone Squelch • DTMF Encode & Decode (with optional UT108) • Digital Voice & Data Communication (with optional UT118 • 207 Alphanumeric Memories

NEW

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch • Detachable Front Panel standard (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied: HM133.

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495 KHz - 1 GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

ICOM

iCOM 48

Call you local ICOM dealer

www.icom.net.au or (03) 9549 7500

The magazine for AUSTRALIAN radio amateurs

Amateur Radio

Volume 73 No.12
December 2005

WIRELESS INSTITUTE OF AUSTRALIA

$6.50
incl GST

Amanda VK4FRST: first Foundation Licence holder

9 770002 685123 12

Amateur Licence Reform – just in time?

A Linton-Harrison Report

BENELEC

YAESU

A Portable for All Situations.....

... with a BONUS!

Clearance Item*
VX-1

2m / 70cm
$310.20

VX-2

2m / 70cm
$343.20

Clearance Item*
VX-5

2m / 6m / 70cm
$441.70

VX-6

2m / 70cm
508.00

Clearance Item*
VX-150

2m
$227.70

Included with These Models

FREE
Soft Hook Ear Plug
with inline Mike & PTT

Value $68.00

Included with These Models

FREE

Value $68.00
Speaker Mike
with CT91

VX-7

6m / 2m / 70cm
$695.00

FT-60

2m / 70cm
$375.90

VX-170

2m
$290.80

*While Stock last

All Price icludes GST

Benelec Approved Amateur Transceiver Dealers

NSW
Andrews Communications Systems
Tel: 02 9636 9060 lee.andrews1@bigpond.com

Newcastle Pro Sound & Communications
Tel: 02 4965 6899 sales@newcastleprosund.com.au

Action Communications
Tel: 02 4732 2788 action@pnc.com.au

VIC
Strictly Ham P/L
Tel: 03 9729 7656
vk3my@bigpond.net.au

G & C Communications
Tel: 03 5996 3298
gccomm@bigpond.net.au

Qld
Kyle Communications
Tel: 07 3857 4400
mark@kyle.com.au

OzGear
Tel: 07 3114 2506
sales@ozgear.com.au

SA/NT
POSNAV Systems P/L
Tel: 08 8285 2400
brenton@posnav.com.au

WA
Bushcomm Pty Ltd
Tel: 08 9296 0496
bushcomm@bigpond.com

www.benelec.com.au

Amateur Radio

Volume 73, Number 12
December 2005

The Journal of the Wireless Institute of Australia

ISSN 0002-6859

Editorial

Editor: Colwyn Low VK5UE
edarmag@chariot.net.au

Technical Editor: Peter Gibson VK3AZL

Submission of material to Amateur Radio Magazine

General and Technical articles to
Secretary
AR Publications Committee
3 Tamar Court
Mentone VIC 3194
or armag@optusnet.com.au

Columns and Letters to the Editor to
Editor
AR Magazine
34 Hawker Crescent
Elizabeth East SA 5112
or
edarmag@chariot.net.au
(Tel and Fax 08 8255 2138)

Hamads to
"Hamads" Newsletters Unlimited
PO Box 431
Monbulk VIC 3793
Fax 03 9756 7031
newunltd@bigpond.net.au

Advertising
All enquiries to
Newsletters Unlimited
PO Box 431
Monbulk Vic 3793
Phone: 03 9756 7797
Fax: 03 9756 7031
newunltd@bigpond.net.au

Registered Office
10/229 Balaclava Road,
Caulfield North VIC 3161
Australia
Phone: 03 9528 5962
Fax: 03 9523 8191

Production Deadlines

Advertising booking and articles for publication 10th of preceding month.

Hamads and advertising material deadline 18th day of preceding month

GENERAL

Are you ready for action? (part 2) 11
Bill Isdale VK4TWI

Shanghai'd to BY4AA 13
Thomas E. King VK2ATJ

New lights in the sky. Earth generated radio lights up the ionosphere 16
Bill Isdale VK4TWI

Sitting at history. Mawson of the Antarctic's desk supports amateur's radio 19
Allan Doble VK3AMD

To DX beyond the western sky. IOTA on Dirk Hartog island 22
Nigel Dudley VK6KHD

Amateur Licence Reform – just in time? A Linton-Harrison Report 25
Jim Linton VK3PC and Roger Harrison VK2ZRH

9 Band DXCC Presentation 43
Michael Owen VK3KI

TECHNICAL

What a sight! an antenna with a difference 5
Mark Aitken VK3JMA

DATV down under (part 2) 7
Richard L Carden VK4XRL

Synchronised antennas 9
Dave Giles VK5DG

An efficient tuner for small 160 meter verticals (Technical abstracts) 27
Peter Gibson VK3AZL

The VK5BR-X antennas 48
Lloyd Butler VK5BR

COLUMNS

ALARA 35
AMSAT 37
Beyond our shores 39
Contests 41
Directory 56
DX News & Views 39
Editorial comment 2
Hamads 54
HF predictions 52
News from... 30
VK2 30
VK4 33
VK5 31
VK7 33
Spotlight on SWLing 36
Technical Abstracts 27
VHF/UHF – an expanding world 44
WIA comment 3
WIA news 4

Our Cover this month

Congratulations to Amanda Gray VK4FRST, the first Foundation Licence holder. The cover photo shows her operating on 2 m. For more details see ALARA column on page 35.

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the National Office on receipt of a stamped self-addressed envelope.

Back Issues

Back issues are available directly from the WIA National Office (until stocks are exhausted), at $4.00 each (including postage within Australia) to members.

Photostat copies

When back issues are no longer available, photocopies of articles are available to members at $2.50 each (plus an additional $2 for each additional issue in which the article appears).

Disclaimer

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.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation 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 Office of the WIA
10/229 Balaclava Road, Caulfield North Vic 3161
Tel: (03) 9528 5962 Fax (03) 9523 8191
email: nationaloffice@wia.org.au
http://www.wia.org.au

All mail to
PO Box 2175 Caulfield Junction VIC 3161
Business hours: **10am – 4pm weekdays**

National Office staff

Judith Oliver	Office Coordinator
Emma Trebilco	Examinations Officer
Brenda Edmonds	Office Volunteer

Board of Directors

President	Michael Owen	VK3KI
Vice-President	Ewan Mcleod	VK4ERM
	Robert Broomhead	VK3KRB
	Glenn Dunstan	VK4DU
	Trevor Quick	VK5ATQ
	Ted Thrift	VK2ARA
	Phil Wait	VK2DKN
Secretary	Chris Jones	VK2ZDD
Treasurer	David Pilley	VK2AYD
Assistant Treasurer	Bruce Bathols	VK3UV

Coordinators

AMSAT	Graham Ratcliff	VK5AGR
ARDF	Jack Bramham	VK3WWW
Australian ARISS	Tony Hutchison	VK5ZAI
Awards	Mal Johnson	VK6LC
Contests	Ian Godsil	VK3JS
John Moyle Memorial FD Manager	Denis Johnstone	VK3ZUX
Editor "AR"	Colwyn Low	VK5UE
EMC/EMR	Gilbert Hughes	VK1GH
	Keith Malcolm	VK1ZKM
Standards	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	John Bishop	VK2ZOI
NTAC	John Martin	VK3KWA
Historian	t.b.a.	
IARU Region 3 Liaison Officer	Neil Penfold	VK6NE
Intruder Watch	Glenn Dunstan	VK4DU
International Travel Host	John Miller	VK3DJM
ITU Conference and study group	Gilbert Hughes	VK1GH
	David Wardlaw	VK3ADW
	Keith Malcolm	VK1ZKM
QSL Curator	Ken Matchett	VK3TL
QSL Manager (VK9/0)	Neil Penfold	VK6NE
Videotapes Curator	VK2 Division	
Webpage co-ordinator	Colin Thompson	VK2TRC
WICEN	John Weir	VK3ZRV

ACA Liaison Team

Gilbert Hughes VK1GH
Keith Malcolm VK1ZKM
Peter Mill VK3APO
Glenn Dunstan VK4DU

Editorial comment

Colwyn Low VK5UE

The sixth Christmas

Christmas is with us once again. The state of the world does not seem to have changed much for the better since last Christmas. We have continuing wars and natural calamities. We certainly need the message of hope that Christmas brings. I wish all members a Happy Christmas and a prosperous New Year.

I suddenly realised that this issue completes my sixth year as Editor of AR, a job I took on for a year while a long term editor was found!. It has been an interesting experience and I thank all those who have supported me through the years, the Publications Committee, the various Presidents and the contributors. If it were not for the contributors there would be no magazine and if it were not for the columnists there would be no news. The columnists are a bit like the Editor; every month they have a job to do even if they are on holiday. I have sat at a terminal in Durham, England, correcting the next issue of AR. That did not endear me with my XYL!

Don Jackson VK3DBB has decided to retire from the Publications Committee. I enjoyed working with Don and need to place on record my and the WIA's appreciation of Don's contribution to AR and the WIA. Don was Secretary of the Pub Com, produced the statistics on the composition of AR and helped vet the HamAds. His quiet competent support of the Pub Com and the Editor was much appreciated. Thanks Don 73. Ernie Walls, VK3FM/CEW has agreed to join the committee.

It is good to see that the Foundation licence is rapidly producing new amateurs and also many young amateurs. The WIA News column shows that this is a world wide phenomenon and IRLP provides a simple way of contacting DX without having to set up large beams, long wires and/or tall poles.

This is the time of year when we may decide we should do things differently. More time on amateur radio, less time on amateur radio. Fix the antenna system, add to it or change it. Work more contests, spend less time on contests. Get out on a field day, give up field days. Make a real effort to get a DXCC award. You might even think about sharing something you have found useful and/or interesting with other amateurs through AR magazine.

The arrival of the new Foundation licensees has placed a challenge to all existing amateurs and to AR magazine. What we need to do is publish a series of articles aimed at this group providing simple advice, describing simple equipment for the new shack and also providing simple theory on aspects of equipment function or possibly propagation variations with frequency, time of day, time of year and meteorological conditions. As I said last month we only survive on members' input and if AR dies from lack of input there is no-where else to go relevant to the Australian amateur scene. To put it simply AR needs articles relevant to all licence classes and to beginners. How else are they to learn or even learn what is the correct question to ask?

So on behalf of all those who produce *Amateur Radio* magazine I hope you have a great time over Christmas and the New Year and that 2006 brings you great satisfaction with what you do, what you build and what you give to others.

73 Colwyn

The President, Directors and office staff of the Wireless Institute of Australia

wish all members and readers of Amateur Radio

a very happy holiday season and a prosperous 2006

We will be back to serve you again in February

Michael Owen VK3KI

More on the Foundation Licence

In last month's *Amateur Radio* I reported on the coming into effect of the new amateur licence structure, the first Foundation Licence Training Course conducted by the Gold Coast Amateur Radio Society over the weekend before the amending Determination came into effect, and the issue of the first Foundation licences only days later.

As the piece was called, "that was the week that was"! Now that week is four weeks behind us, I would like to follow up on what has happened since then.

In those four weeks I have met with clubs in Tasmania and the representatives of New South Wales Clubs in Sydney. My overwhelming impression is that many amateurs see the qualification of new amateurs as the immediate challenge to their current resource. Some of us have turned coordinating our assessment responsibilities into an almost full time occupation.

Your Entry into Amateur Radio – The Foundation Licence Manual is published, to a very favourable reception.

The flood of inquiries about the Foundation Licence has eased. It almost stopped the office. We put the answering machine on so that others outside the office could answer the queries.

What have we learned?

It is clear that there is a great demand for the new entry-level licence, even without publicising it except in a couple of isolated cases. Where promoted, the response has been even greater.

The practical assessment's emphasis on operating procedures is important in producing new amateurs with an understanding of amateur procedures, rather than some made up procedure or some modified CB procedure. With hindsight, that aspect of the syllabus is more important than I first thought.

Assessors are, in many cases, extending the practical assessment in smaller groups over ensuing evenings to ensure the proper levels of instruction, coaching and assessment are achieved. This has also assisted candidates to gain higher levels of on-air confidence.

We have also learned that there is a limit to the number of Foundation Assessment Packs that we can produce, though it would seem that we would be able to meet current demand until the end of January. We are not processing the results as quickly as we would like, and if too many come in at once, ACMA will be unable to process more than a certain number a week. In the short run, please expect and accept delays.

Delays may happen because it would be irresponsible to apply our whole resource to the single project.

We are still implementing our new membership management software and our interlocking accounting systems. Like all such introductions, glitches can happen. We sent out reminder notices to many people who had paid by direct debit. Hopefully, after many apologies, that won't happen again.

We are still introducing a better bookshop.

We are still filling orders from clubs and individuals for the new Callbook, at the same time as we are filling orders from clubs and individuals for *Your Entry into Amateur Radio.* We have orders for over 2,200 of those books from single copies to cartons. The WIA is filling these with the help of absolutely invaluable volunteers. (We need more, if you live in Melbourne and can help, please contact us.)

The introduction of a Foundation Licence as the new entry to amateur radio in Australia is one of the most important changes to the structure of the amateur service in very many years. We just have to respond to this opportunity. It cannot be the total focus of everything we do, butit must have a real priority. Getting the balance right is the trick.

Will the Foundation Licence really attract new amateurs? Will they retain their interest? Will they aspire to and achieve higher levels of qualification?

Only time will answer those questions, but the UK experience is encouraging.

Our new assessment procedures are a vital part of making amateur radio attractive to a new generation.

Our new procedures mean that for the first time a candidate for an amateur qualification assessed by a WIA Assessor is dealing with someone actually qualified to do that task.

Our new procedures mean that a candidate assessed by a WIA Assessor learns the result immediately, and will be given guidance as to where more work is needed, if that is appropriate.

Our new procedures mean that for the first time there is quality control, with the annual audit of each WIA assessor, and with accreditation renewable each three years. This level of quality control ensures that the standards set are the same across the country. Varying standards are a real risk with the value judgements of the practical assessment.

This does not mean we do not need the existing invigilators and group leaders. We will not, for a long time, have enough qualified assessors.There is a real need for the present groups to continue to work together.

It is my hope that what the WIA has invested in creating a new qualification system, and what so many people have invested their time and their energy in, will stand us in good stead when ACMA seek to review the future responsibility for amateur examination management, as contemplated in the "Outcomes" paper published in May 2004.

In short, amateur radio and the WIA are going through a period of real change, and I believe, change for the good, ensuring the future of the amateur service.

Our success at coping with this change depends on a number of factors. One is the essentiality of the clubs and the WIA working together to meet the demand. Another is that we must realise that we cannot put pressure on WIA Assessors to do more than they reasonably can do in a day for, if we do, we will encourage mistakes. Another is to realise that our resources are finite, both administratively and with the number of available Assessors at any one time.

And finally, our success depends on goodwill, understanding and patience.

And with all of that, I have faith in our future.

ar

WIA News

WIA adopts election regs and appoints Returning Officer

Clause 14.1 (c) of the WIA Constitution says, in part, that "The Board may determine that the election of Directors be conducted by postal ballot with the result of the election to be announced at the annual general meeting. A postal ballot shall be conducted in accordance with the regulations made by the Board from time to time."

The WIA Board has decided that election of directors will be by postal ballot and has adopted regulations to govern the postal ballot. These have been placed on the WIA website.

The Board has appointed David Wardlaw, VK3ADW, as Returning Officer to conduct the postal ballot required before the next Annual General Meeting. A notice calling for nominations for election as a WIA Director is in this AR.

A Bookshop Update

The WIA bookshop thrives and is stocking ARRL's QST magazine. If you are interested, get in quickly. The November QST is available now.

VK3PC appointed chairman of IARU Region 3 Disaster Communications Committee

At the 2005 IARU Region 3 Directors meeting held in Bangalore on October 5 - 7, 2005, the Directors appointed Jim Linton, VK3PC, as the temporary Chairman of the IARU Region 3 Disaster Communications Committee. Jim's term is until the 13th IARU Region 3 Conference at Bangalore, India, in 2006.

Freeze on new 2-letter callsigns

Under the new amateur licensing arrangements, callsign groups allocated to the Advanced licence include all groups previously allocated to the Unrestricted, Intermediate and Limited licences. A person with a Z call may now apply for a callsign previously only available to a full call.

Two letter suffix callsigns are in short supply particularly VK2, 3 and 4.

These callsigns are not being issued until ACMA can develop an equitable arrangement for their allocation. This is expected shortly.

President meets VK7 clubs

On 9 November WIA President, Michael Owen, VK3KI met members of the Northern Tasmanian Amateur Radio Club at a meeting/BBQ at the home of secretary David Potter, near Launceston.

Next evening Michael met members of the Radio and Electronics Assoc of Southern Tasmania at its clubrooms in the former OTC Marine Wireless Station in Queen's Domain in Hobart.

Both meetings were well attended, and Michael reported on what was happening in the WIA, but most attention was paid to the new assessment system and the need for Foundation licence courses, and the need for more WIA Assessors.

ACMA adds info page on licence changes on website.

ACMA have added a "frequently asked questions" and information page covering the recent changes made to the amateur service. This page is at:
http://www.acma.gov.au/ACMAINTER.65690:STANDARD:551322618:pc=PC_1256

Silicon Chip slams BPL

Electronics magazine *Silicon Chip* says broadband over powerlines (BPL) is a flawed technology flying in the face of EMC regulations. The November cover story "BPL is coming" looks at the spectrum-polluting broadband enabling technology delivered along power lines.

The article said that BPL promises delivery of fast broadband with little new infrastructure. BPL has been a pipedream for years. But the wires to carry the broadband signals are stretched in the air and make "magnificent antennas radiating interference" across the spectrum.

15 new Tassie Foundation Licensees

On 22 November the Radio Electronics Group of Southern Tasmania ran Foundation Licence Training and Assessment at their Hobart Clubrooms.

Fifteen participants attended training, including a 15 year old, a number in their 20s and an amateur's XYL. Some had attempted the former Novice exams and others had used CB for many years but never stepped up to amateur radio. Four had assisted with WICEN operations on car trials so had some valuable operating experience.

Although the only trainer and WIA assessor was Reg VK7KK, the group received much operating practice and training from some helping amateurs both at the clubrooms and over the air.

Ten candidates were assessed on Sunday; the other 5 will be assessed the following weekend. It is hoped that by the end of the following weekend there will be 15 newly qualified VK7s.

Activity increase for young people in amateur radio

Around 30% of the people who are studying for the new Australian Foundation licence are 18 or under and it seems that worldwide the number of young people attracted to the hobby is growing. The following two items support that contention.

John Schurman, AA7UJ reports that IRLP Node 3978 in Seattle, WA is the primary repeater for a group of kids from Benjamin Franklin Elementary School. A teacher, Dave Condon KI7YP, has brought more than 400 new hams on the air with his program for ham radio. They also have worked with ICOM to produce a couple of ham radio comic books.

Peter Treadwell, G7PCT is a UK schoolteacher teaching ham radio to two classes of 20 plus 14 year olds. He is interested in finding similar groups and would like to make on air contact with them. He is on IRLP node 5350. Time Zones might be a problem as his classes in radio are on Fridays at 9.45 to 10.35 and 14.35 to 15.25 UTC.

WIA, AR NSW and Clubs Meet

On Saturday, November 19, 2005 the joint conference of New South Wales and ACT clubs was held at Amateur Radio House, Wigram Street, Parramatta.

Over 20 people participated in the meeting.

Following opening addresses by ARNSW President Chris Devery, VK2XCD, and WIA President Michael Owen, VK3KI, topics discussed included the Foundation Licence, BPL, State and National Broadcast contents and format, dealing with deceased estates and the essentiality of a true WIA/club partnership.

John Gibling, VK2EKG, provided a presentation on working with young people.

It was agreed by all clubs present that the WIA/club partnership is working well for the benefit of amateur radio.

ar

What a sight! an antenna with a difference

Mark Aitken VK3JMA

Not being an HF buff, but requiring a minimal but effective all-band antenna that would suit She Who Must Be Obeyed (SHMBO), I started to surf looking for some type of antenna that would suit these requirements.

I usually used my 80 m dipole and an antenna tuner to give me most HF bands with a degree of good operation, but as Murphy would have it, there was always some thing that did not perform adequately even for an "novice" HFer.

Then, by chance, my brain remembered that I had been given a complete but damaged TH3jr a few years ago and together my brain and I set about rigging up the driven element to my ridge pole in a simple 10/15/20 m trapped dipole. I fed it with the balun that came with the TH3JR and was happy to see relatively good VSWR figures without the antenna tuner. The tuner was used just to take up the slack and give me that 1:1 (or as close as possible) VSWR.

Why not just fix up the TH3jr and use that. Remember SHMBO? Even I didn't want the thing hovering above the roof.

Then I was very lucky to be given a Nally Tower from a friend and this then altered the requirements of antennas around the place and gave me the opportunity to clean up a bit more.

It was decided that I would have only the following antennas around the place....

Firstly, 6 m/2 m/70 cm and 23 cm verticals attached to "hockey stick" poles on the second story eaves, nice and neat, un-obtrusive and easy to install.

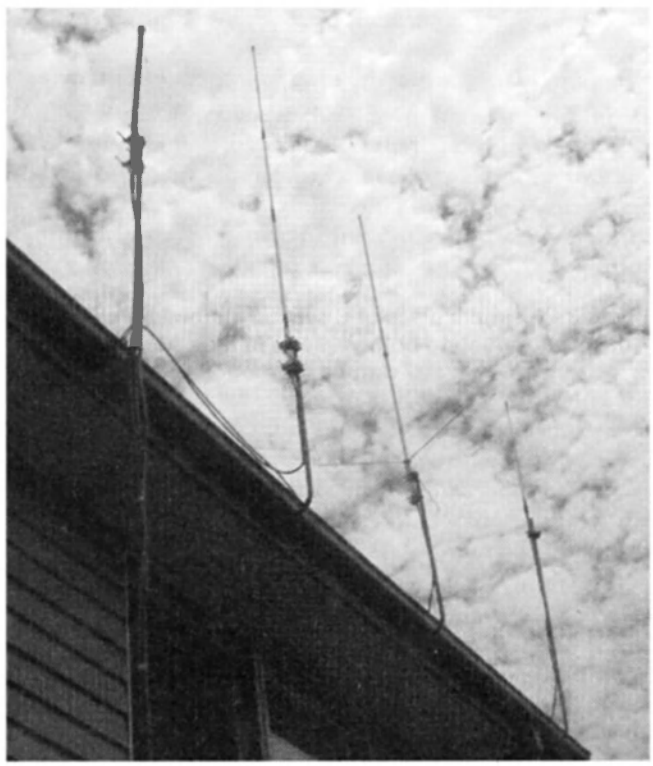


Photo 1 – 6 m/2 m/70 cm and 23 cm verticals attached to "hockey stick" poles on the second story eaves, nice and neat, un-obtrusive and easy to install.

Next, HF antenna mounted on the tower, along with 6 m/2 m/70 cm and 23 cm horizontal beams for weak signal modes (not yet installed).

Finally, remove all antennas from the second storey ridge pole apart from the 2.4 GHz wireless LAN dishes.

That was discussed with SHMBO and, although grumbling did occur, it was settled.

Now back to the "antenna with a difference".

The tower had changed my HF situation somewhat. How it was to be positioned on my block would have my 80 m dipole bent in all sorts of directions and would probably end up being less efficient than it already was? I started to think about the old Chirnside 5-band trapped vertical that I had lying around in the back yard but remembered all sorts of horrible things about using it on all but 29 MHz FM years back so I really did not feel like re-visiting that scenario.

However, the thought of a 5-band horizontal dipole did have attraction, but not your usual wire and trap one or a multi-band one like a G5RV; same problem with the 80 m dipole, bent here, twist there, messy!

I thought why not just have two HF verticals mounted end-to-end and feed like a normal dipole? Yes, I thought it would work. I then set out in search of a second Chirnside 5-band HF vertical exactly like the one I already had. www.vkham.com classifieds worked like a treat and I promptly asked for, received a reply, and bought a second unit from VK6.

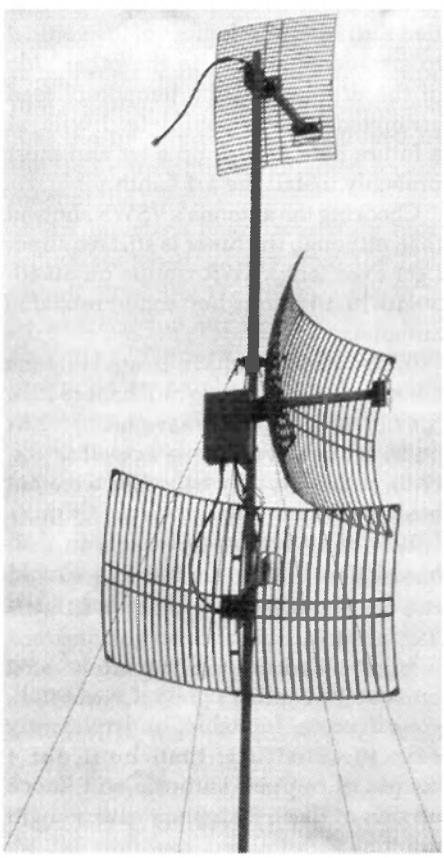


Photo 2 - The 2.4 GHz wireless LAN dishes.

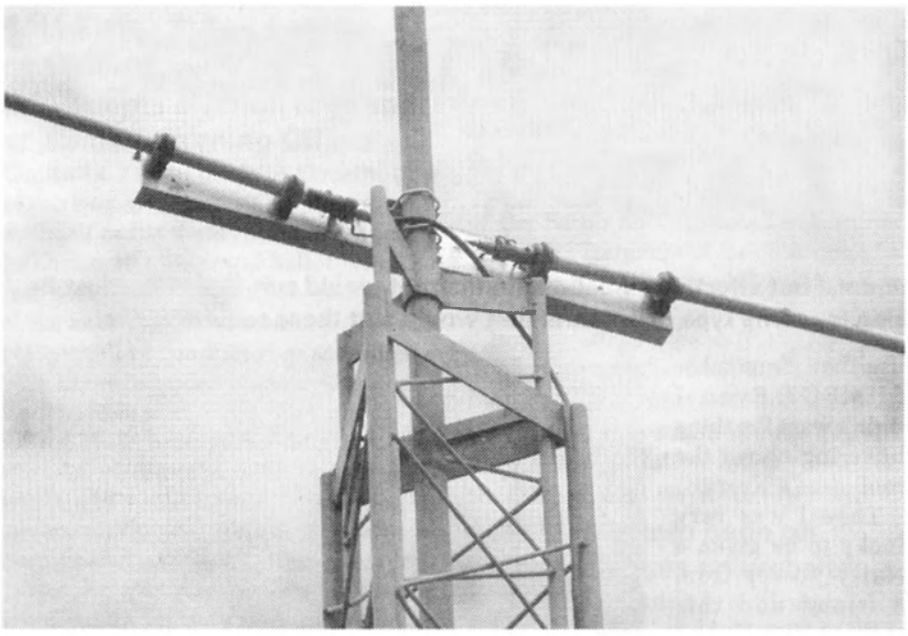


Photo 3 - A simple piece of C section aluminium about 750 mm long as used as the basis for mounting both verticals in their horizontal position along with suitable U-clamps for mounting to the tower pole.

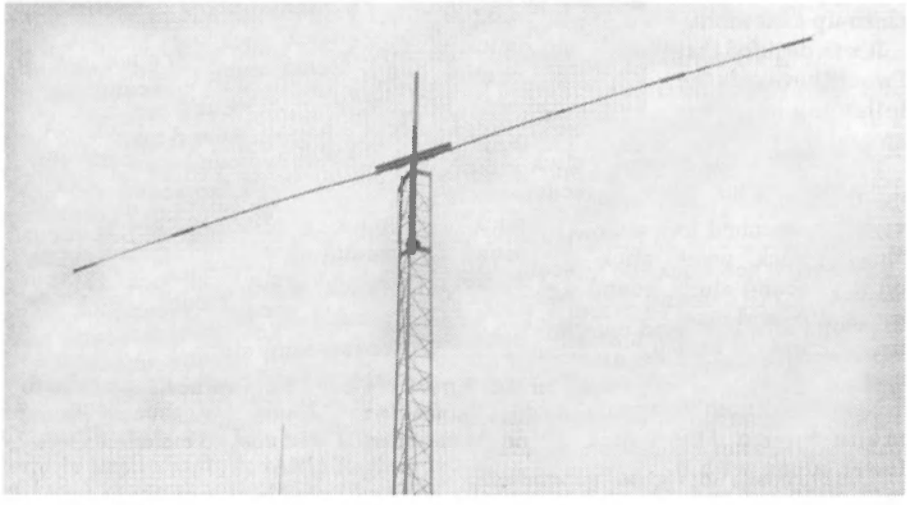


Photo 4 – The two vertical antennas mounted as a horizontal dipole on the tower.

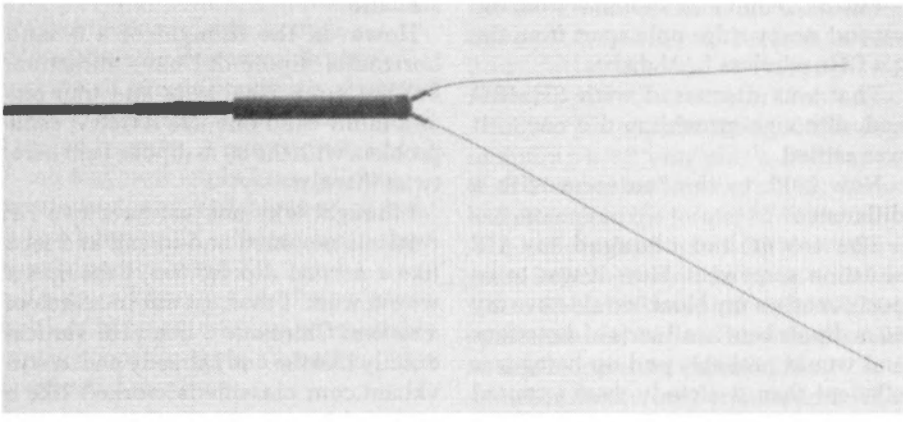


Photo 5 – The far end of one of the Chirnside vertical antennas mounted horizontally.

A simple piece of C section aluminum about 750 mm long was used as the basis for mounting both verticals in their horizontal position along with suitable U-clamps for mounting to the tower pole.

Drill, drill, screw, screw, tighten, tighten and it was done on the ground. The nature of my backyard and the size of the antenna, about 11 m long now, did not enable me to tilt the tower over for ground level mounting. I donned the pole climbing safety belt, an absolute must for any ham that works on top of their tower for whatever reason, and worked in mounting the antenna from atop the tower.

No mean feat but none the less completed in about an hour.

Feeding it was the next task. I would have liked to make up a 1:1 balun but didn't want to wait – impatient! So I simply fed one side of the trapped dipole arrangement as if it was a normal vertical, ie, directly into the SO239 of the antenna. This took care of one side and the earthing/ground side was also taken care of as I have tied both the ground sides of each vertical together and grounded this to the main mounting bracket. Then a shorted PL-239 plug was screwed into the other socket and that tied the radiating element of the vertical to ground potential, ie the other side of the dipole, and the temporary feed arrangement was complete. I will, at a future date, tidy it up a bit and most probably install the 1:1 balun.

Checking the antenna's VSWR showed that, although the tuner is still required, I get excellent VSWR results on 80-40-30-20-15-10 in one horizontal rotatable antenna.

Initial on air results indicated that the antenna is "hearing" so much more than the old 80 m dipole. I have heard VK6s on 20 m like never before, as well as JAs, FM6, and Gs on 40 where they were not heard before.

This may not seem much to die-hard HFers but for me this is a 10 fold improvement on what I have been used to.

So, in conclusion, if you are looking for something, like me, that was small, yet effective, rotatable, and relatively easy to construct, then hunt out a couple of trapped verticals and knock up one of these 'antennas with a slight difference'.

ar

DATV down under (part 2)

Richard L Cardan VK4XRL

This article was originally published in CQTV 204, November 2003

With reference to my earlier article, further tests have been carried out on 13 cm. A new power amplifier for 23 cm, and finally a digital receiver, have been placed in the repeater VK4RKC to further educate and provide information on propagation due to changing weather conditions.

Repeater operation

The repeater VK4RKC is situated some 54 km north west of my QTH and overlooks most of Brisbane and the Sunshine Coast. It's an ideal site as we don't need to rotate the receiver antenna and the transmitter antenna is a sixteen-element phased array.

One of the problems that faced us during the planning stages was how to recognise the digital signal. This is due to the receiver giving out the dreaded blue screen effect. After trying a number of receivers, a digital receiver type ELSat-ZDX 9111E appeared across the desk. This receiver had a red LED that switched on when a digital signal was being received. Also, it was a no frills receiver that suited installation in a repeater. Another nice feature was that the received testpic produced by the DATV transmitter remained locked most of the time.

An interface board was duly built which switched a relay from the LED circuit, enabling the relay contacts to be utilised for any requirement that may arise. In order to keep the analogue operation in parallel with the digital operation, a separate interfaced stereo audio and video switcher was also built. It was designed using relays and its rest position was across the analogue signal. This now allows us to see the difference between the received analogue and digital signals even though we are transmitting back on 426.25 MHz AM. This situation may not be for long as the bottom part of the 70 cm band, 420 – 430 MHz, may be removed for other services.

13 cm operation

The required software changes were made and downloaded to the DATV unit. The frequency was set to 2415 MHz, all other parameters being left at 6000 SBR, ¾ FEC and 5500 video bit rate. The output from the DATV unit produced a carrier at an output level of 0 dBm and the shoulders were at –42 dBc.

The power amplifier used was a local unit from Mini-kits in South Australia. It is a nominal two watt unit, running class 'A' and the part number is EME91B.

This unit worked very well with the FM modules producing the full two watt output. Once connected, the system produced an output of +26 dBm with shoulders at –30 dBc.

23 cm operation – new power amplifier

One of the main problems has been to raise the power level up to at least half the analogue power level. In my situation I use around 2w on FM to operate the repeater; we know that +25 dBm can access the repeater also. However, due to weather conditions this could be subject to the cliff effect. What I wanted was at least one watt. Therefore an amplifier was constructed using dual power modules type M67715. Two 3 db couplers were made using hard line, with the centre removed and replaced with a twisted pair of enamel covered wires, each wire representing 100 ohms impedance. With two 100 ohm lines in parallel the required impedance of 50 ohms is achieved. I made up an Excel program to calculate the required lengths for the 3db couplers.

This amplifier, via an external 3db pad, produced an output of +30 dBm maximum with shoulders sitting at –30 dBc. The second harmonic was at –40 dBc and noted spurs at 340 to 710 MHz were at –50 dBc. When first used with the repeater, the transmitted signal interfered with the received signal from the repeater - the FM transmitter was clean in this regard. The output from the DATV transmitter was then checked more thoroughly this time. The second harmonic was at –30 dBc and noted spurs at –46 dBc. An inter-digital filter, which I had on hand, was then inserted between the DATV output and the amplifier input. Now the output signal was clean with spurs >-70 dBc and the second harmonic was now at –50 dBc.

The next step was to add an extra encoder board to the system. This was purchased and the video bit-rate set to 2300 k. Little information could be found on the web regarding the requirements in setting up the system for two encoders. One cannot arbitrarily set the SR and hope it works. To this end an Excel spreadsheet can be found on the S5-DATV- ATVS Slovenian ATV site which works out the SR for different overall bit-rates at ¾ FEC.

Armed with this information, a small Excel program was made to determine the allowed bit-rates for both encoders, taking into account the two audio streams at 192 k, the teletext at 300 k and the testpic was set at 300 k (couldn't find any real figures for this one).

The Excel program was a useful aid in setting the bit-rate parameters. We opted for an SR of 7500 which gives a signal bandwidth of 10 MHz.

Conclusions

The system works very well and a second digital receiver will be placed at the repeater site in due course. Also, we have now access to a 2.4 GHz transmitter that can take either analogue or digital. Unfortunately, the IF is around 36 MHz and was used for MDS. Since a lot of receiving equipment has come onto

the market we may at this stage opt for VSB.

It may be possible at a later stage to try dual 2 W amplifiers at 13 cm as per the 23 cm unit. Also, note that the M67715 is becoming obsolete and is being replaced with a MOSFET unit type RA18H1213G. It is hoped we can try these out as soon as we can lay our hands on them.

Another development that is worthy of a second look is the Dutch DATV system and I would like to thank Henk for his continued feedback on its development. I would also like to thank Mark VK5EME of Minikits for his support.

References

www.minikits.com.au

www.d-atv.com

http://lea.hamradiosi/~s51kq/S5-DATV.HTM

ar

DATV update

Since writing the two articles 'DATV down under', the reference to the Mini-kits 2 W power unit has been superseded and replaced with Kit Part Number E128 KITB. This kit now uses a PHEMT MMIC IC, which has a gain of 29 dB, and a saturated output power of +33 dBm at –1 dB compression point.

I have now purchased one of these for evaluation, and it would appear possible to run this at 6 dB lower than the +32 dBm output (ie +26 dBm) for shoulders around –30 dBc. Two of these units could then be used for near +30 dBm output.

The RA18H1213G power amplifier is now available from Mini-Kits. The suggested ratings for this unit are 18 W output for 200 mW I/P on FM ATV or 14 W PEP linear output on SSB. I have now purchased one of these for evaluation on DATV. The norm has been to run these at –6 dB lower than the stated output for DATV. This would mean an output of +35 dBm or 3 W approx. Tests have indicated this to be correct with shoulders around –35 dBm. If more power is required then again two of these units could be coupled together via 3 dB couplers producing a power output of around +38 dBm (ie 6 W).

The Dutch System mentioned in those articles has now had a pre-production run and it shouldn't be long before these are available. The web site www.d-atv.com has also been updated with many photos and articles relating to DATV and especially to their own system. This is in English and is worth reading. Also take a look at Mini-Kits Web site at www.minikits.com.au for further information on the above power amplifiers including price and availability.

ar

Synchronised antennas

Dave Giles VK5DG

During the last full weekend in June the ARRL holds its annual field day contest. This year the controllers for the AMSAT OSCAR-51 (AO-51) satellite placed it in mode V/S from 17 to 26 June so everyone could get plenty of practice before the contest. Mode V/S involves transmitting to AO-51 on 145.920 MHz (FM with a 67 Hz CTCSS tone) and receiving on 2401.200 MHz FM. The transmitter on AO-51 transmits continuously with ~2.5 watts output. In theory, very small receiving antennas are usable.

Equipment for S-band (2.4 GHz or 13 cm)

A PCB Yagi and PCB dual patch antenna were purchased from Alan VK3XPD at the SERG convention. The PCB Yagi has five elements, gain of 8 dBi and measures just 70 x 65 mm. The dual patch is not much bigger with similar gain. The PCBs were supplied bare so Teflon coax with SMA plugs were soldered to the antenna elements.

I have been using the Pacific Monolithic MMDS down-converters (that were used locally for the failed MMDS TV system) since 2001 with amateur satellites UO-11, AO-40 and AO-51.

For receiving 2401.200 MHz the down-converter's output is around 450.200 MHz. The design tuning range is 2300 to 2400 MHz for an output of 349 to 449 MHz. This puts AO-51 at the extreme edge of the down-converter's filtering, but reduces local interference problems with cordless phones. It comes as a sealed unit with its own internal dipole and reflector etched onto the down-converter PCB.

I have modified two of them by slicing the antenna section off the PCB and soldering an SMA connector in their place. The result is mechanically flimsy and unoptimised, but ideal for experimenting with antennas and strong signal sources.

The satellite and operating it

AO-51 is a 24 cm cube with a ¼ wave whip for 145.9 MHz on one side and a sleeve monopole (similar to a ¼ wave ground-plane) for 2.4 GHz on the opposite side. This means that the

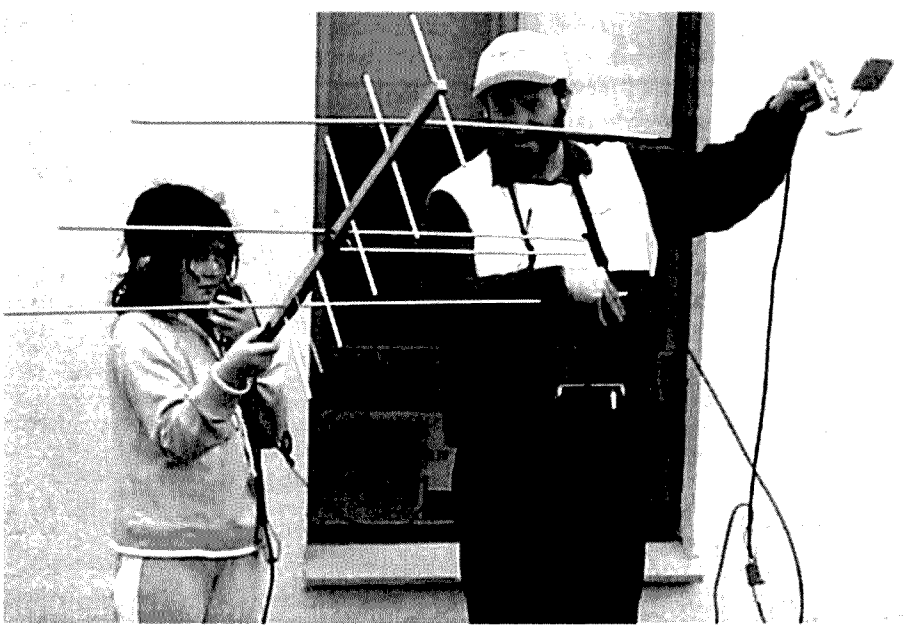


Photo: Dave Giles VK5DG and daughter Naomi work AO-51.

antennas are linear polarised but in line with each other so the polarisation of both will be the same. AO-51's 70 cm antenna is circularly polarised.

Since the satellite may be pointing in any direction at any time as it tumbles through space, the ground station using linear polarised antennas (such as Yagis) must adjust for polarisation changes as well as point at the satellite or suffer deep signal fades. Even with circular polarised antennas, there is some fading when the satellite points its antennas away from the Earth.

The experiment with the PCB Yagi

Sunday morning (19 June 2005) and it was time to try the PCB Yagi and latest modified down-converter. Naomi was keen to have another go at a QSO through the satellite and I needed an extra pair of hands. The photo was taken just after the satellite pass. Naomi is armed with the FT-60, speaker-mike and homebrew "arrow" antenna for the uplink. I have the PCB Yagi, down-converter and FT-817 for the downlink. The radios are running off internal batteries. The down-converter is supplied by a 12 V GelCel on the ground through the bias tee (fitting near my left knee). This is a fully portable setup shown here in my backyard.

As well as operating the transmitter, Naomi had the extra job of watching where and at what angle I was holding the PCB Yagi so she could synchronise the 2 m half of the homebrew "arrow" antenna. With her headphones on she could hear how good a job we were doing.

Operation is easy for the uplink. With a Doppler shift of +/- 3 kHz there was no need to adjust frequency. However, during a pass the downlink frequency moves from +40 kHz to –40 kHz due to Doppler shift. Add to this the poor frequency stability of the down-converter due to thermal and hand capacitive effects (up to +/-30 kHz), and the small capture area of the antenna, and it proved to be a bit of a challenge to tune in to the bird.

Moment of truth

The result? Two QSOs with Jack VK2TRF and Rob VK3KOS. With an S6 noise level from the down-converter, signals peaked around S9. The PCB Yagi works. Both of us found it a challenge and were happy with the result. For comparison, the normal antenna used at VK5DG is a small BBQ grill and unmodified converter which gives signal peaks of S9+20.

In total, 11 contacts were made during the 10 day period.

Later, the PCB Yagi and down-converter were mounted on a 2 m Moxon rectangle (similar to a two element Yagi). Operation could now be made with only two hands - antennas in one, the other for the microphone. The 2 m Moxon connected to the front socket of the FT-817, and the down-converter connected to the rear socket. Both VFOs were used in split mode, the receive VFO being adjusted with the mic up/down buttons. I could communicate through AO-51 but could not hear my own downlink (this simplex style operation is possible on the FM birds but not recommended).

Tests with the dual patch have not been so positive. On four passes the satellite was not heard once. Specifications given are for a frequency range of 2.4 to 2.45 GHz. My example may be tuned to the higher end of the range. Patch antennas have a narrow bandwidth.

Summary

With 2.5 watts of power, the 2.4 GHz transmitter allows very small antennas to be used by the ground station. The receivers on AO-51 are very sensitive, and QRP transmitters and low gain antennas are also usable for the uplink.

Mode V/S has been a semi-regular operating mode for AO-51 with an average of four days each month this year and has proved popular.

Another satellite was scheduled for launch in August 2005 that will use the same transmitter and a 70 cm receiver. With a 70 cm uplink, a future portable ground station could be very small indeed.

ar

Are you ready for action?

Part two

Bill Isdale VK4TWI

The key is the vital element so it needs to be distributed securely to all the radios. If the same key is used to encrypt a large volume of material it can be deduced by mathematical analysis of the encrypted output, so it must be changed from time to time. The key itself could also be compromised by some carelessness or a deliberate leak. It will be remembered that heroic efforts were made in World War Two to capture the encryption keys from U-Boats. The keys were written in water soluble ink on paper that would disintegrate if wet, so valuable was this secret. The keys were also changed daily. The Enigma system, carefully designed and administered, was, we now know, breached and provided intelligence of enormous value.

The Enigma system allowed for about 159 trillion possible daily keys. That is 159 followed by 12 zeroes. This was thought by its designers to be a safe system. A 128 bit key has 2 to the power of 128 possible keys, that is 340,282,366 ,920,938,463,463,374,607,431,768,211,4 56, so the user of such a system may feel pretty good about it. The mind-numbing number may indeed numb the mind.

But if it fails to numb, we might consider that the expression "128 bit key" describes the maximum amount of work needed to try every possible key; it says nothing about the minimum. A person trying to crack this puzzle and using a modern computer may get lucky and find a key which decrypts the data quite early on. On the average, though, it will be necessary to try half of the possible keys to find the correct one. That puts 128 bit keys into some perspective, but even so, it is a mighty task and taking into account that the information needing to be protected may only have to be kept secret for a relatively short time, say a few hours or days in many cases, the system should serve adequately. This is always provided the key is protected. Each radio channel could have its own key, further improving security.

The physical task of loading keys into each radio will be a burdensome one so it might be that a corner will be cut here and a change of keys simply sent out from a central transmitter to reprogram the radios on the circuit; a software upgrade. This would be very convenient but would compromise security as someone listening in at the right time with the right equipment will capture the key and be into the system. The cost saving and convenience of this form of key distribution would reduce security to effectively that of an unencrypted system so it is to be hoped that such a superficially attractive choice is not made.

Before we leave this aspect, the creation of the key is a critical step and worth some thought. In most encryption programs that are around today, the key is generated by the software. It cannot, by definition, generate a truly random string of numbers as the software is running on a machine, a computer, and to quote a famous mathematician and pioneer of electronic computers, anyone who thinks a machine can generate a random number is in a state of sin.

The quality of being random can be thought of as uncertainty or disorder; it is a measure of entropy. More disorder is more entropy.

The key length illustrations that I have used are valid indicators of the work required to find the correct key if and only if the key is generated so as to achieve maximum entropy.

It is common that software which is used to encrypt digital data, such as that stored in computers, and using the supposedly secure 128 bit key length, generates the key from a password chosen by the person who types it in from a keyboard. That person may choose a 10 character password that is, cleverly, not a word but a mish-mash of letters like LFEINVXLJA. The software uses this to generate a 128 bit key but the real randomness in this is of the order of 4 bits of entropy per character. The key is 128 bits long but is only as difficult to discover as if it was a 40 bit key. Bear in mind that each 1 bit of key length, in a truly random key, doubles the potential number of keys such that a 101 bit key represents twice as many possibilities as a 100 bit key. A 40 bit key has 2 to the power of 40 possible keys, that is 1,099,511,627,776. This is not good. A computer trying a billion keys a second would, on average, discover the correct key in 18 minutes. In 1998, ages ago in the development of computers, a machine was built for the Electronic Frontier Foundation at a cost of about US $ 200,000 and it won a prize by finding a 56 bit key used in DES, the US Government's Data Encryption Standard, in an average of 4.5 days. It tried up to 92 billion keys per second. The Banks stopped using 56 bit keys for their inter-bank transfers after that. Computing has delivered about double the "bang" for your buck every 18 months since 1998 so the equivalent computer today ought to cost less than A$ 20,000 and at the speed achieved in 1998 find a key with 40 bits of entropy in an average of 12 seconds.

We can easily and quickly offer the civil authorities reliable and highly secure communications at nominal cost. These are desirable qualities in a system that we can easily make available but hopefully will only have to use for training.

The machine that was built, the DES Cracker, sometimes called "Deep Crack" (no doubt after "Deep Thought" the most powerful computer in the Galaxy in the book by Douglas Adams which became a BBC television series "The Hitchhiker's Guide to the Galaxy") was built especially for the task but with the technology that was available in 1998 to a non-government body; essentially to anyone with money. The same task today will be much more easily, quickly and cheaply achieved than it was then. My estimates are just that but ought to be good enough for present purposes; to show that the encryption key, to make full use of the algorithm, will need to be generated from

a long pass-phrase. A cracking program, which will try the most likely things first, would eliminate the need to try every possible key sequentially, further speeding the process. The DES cracker uses that intelligent software plus purpose-designed hardware approach.

A pass-phrase in English may have only about 1.3 bits of entropy per character, making a 98 character phrase necessary to produce a 128 bit key with the full potential strength.

Assuming the hypothetical system is properly used, it will be capable of providing adequate security. If it is improperly used, however, and human nature creeps in, then it would not even keep journalists and tow-truck operators out for very long.

An illustration, somewhat chilling, of the importance of how a system may in fact be operated so as to defeat itself can be found in the procedures introduced by United States Secretary of Defense Robert McNamara who, upon coming into office in the 1960s brought in a system of "permissive action links" to avoid the inconvenience of someone in the United States Military using nuclear weapons on their own say-so. The arming of the weapons was controlled by devices that would only activate the warhead upon receiving the correct encryption key. That key was carried around in a briefcase known as "the football" by a senior officer who was always right next to the President, who no doubt felt he had control of the nuclear arsenal; a feeling of security.

The orders to implement the system were carried out but the General officers running the Strategic Air Command, perhaps anxious to avoid delays in a crisis, set the keys, it is reported, to 00000000.

This is a story that will be difficult to confirm, but it does fit rather well with some history.

In September 1957, General Curtis LeMay, SAC's Chief of Staff, briefed two visiting members of a review panel that was to report to President Eisenhower, the Gaither Committee. They were Robert C. Sprague, an electronics manufacturer, and Jerome Wiesner, who became President Kennedy's science adviser and then president of MIT. Sprague noted a wall chart of response times that indicated that none of the SAC bombers would be able to get off the ground by the time Soviet bombers were located by the radar network in Canada. LeMay agreed but added, " I will know from my own intelligence whether or not the Russians are massing their planes ... for a massive attack against the United States." He is reported to have then said, "If I come to that conclusion, I'm going to knock the shit out of them before they get off the ground." Sprague pointed out that this was not national policy to which, he says, LeMay replied "No, it's not national policy, but it's my policy".

An important consideration for the design of a secure system will be to make it so that it cannot be defeated from within.

What could we deliver that will meet the needs of the users? It ought to be as secure as the hypothetical system we have considered when that system is operated properly and should be designed to force proper operation so that we do not deceive ourselves into a false sense of security.

Returning to our resource considerations; what is the fastest, easiest and cheapest way to meet the system requirements?

How much existing equipment can be used and what needs to be added? We would look first for off the shelf equipment that could be used or adapted for use.

A solution which suggests itself is to use the existing well proven technology of packet radio, at whatever frequency is the best fit for the task and exploit the reliability of that method to send text messages rather than to try to use voice. Contemporary software allows text files to be sent as attachments to the packet radio message and readily available encryption programs of respected pedigree can be used to encrypt the plaintext before sending it as an attachment. The use of mailbox facilities makes it unnecessary for the sender and receiver to be on the air at the same time so messages could be sent at any time and read when the addressee has the time to access their electronic mailbox.

The security will be first rate if the key is made and handled properly so keys of appropriate length and randomness could be created in advance, copied, distributed and held by the intended users of the system in sealed envelopes. A supply of these keys could be provided and, for instance, numbered so that the message could contain the relevant key number in the plaintext part of the message. Without access to the key itself the encrypted attachment is secure. The keys could be changed as desired. The person who receives the message reads that key number so and so has been used and, using a computer running the same encryption program, enters that key as the "password" and the message is decrypted.

This is capable of early implementation at a nominal cost. The distribution of the keys must be done in advance but a practical key control system is a simple clerical task. The envelopes containing keys would have to be securely held and a system put in place to report any loss of security over a key so that it does not get used.

The encryption algorithm that is chosen could permit various key lengths so there will be a capacity to select a higher level of security when necessary and to implement it easily.

Holding the decrypted information is something which needs to be thought about and a system for secure deletion of plaintext from the computers which are used can be employed.

We can easily and quickly offer the civil authorities reliable and highly secure communications at nominal cost. These are desirable qualities in a system that we can easily make available but hopefully will only have to use for training.

A selected bibliography

Blair, Bruce G. Ph.D. Former USAF nuclear launch officer and now President of the Center for Defense Information. www.cdi.org/blair/permissive-action-links.cfm

Kahn, David. *Seizing the Enigma.* 1996 Arrow Books.

Newhouse, John. *The Nuclear Age. From Hiroshima to Star Wars.* 1989 Michael Joseph Limited. The Penguin Group.

New Scientist. 3 July 2004, page 56.

Schneier, Bruce. *Secrets and Lies. Digital Security in a Networked World.* 2000 Wiley Computer Publishing.

Sebag-Montefiore, Hugh. *Enigma the Battle for the Code.* 2001 Phoenix.

Singh, Simon. *The Code Book.* 2000 Fourth Estate Limited.

Time magazine 1 February, 1999. Encryption key lengths.

ar

Shanghai'd to BY4AA

A visit to China and the BY4AA Amateur Radio Club

Thomas E. King VK2ATJ

This article was written to let Australian Amateurs know something of amateur radio operations in China and how they might operate amateur radio when visiting China

Though there are around 80 club stations in Shanghai, Mr. Chang, General Secretary Engineer of BY4AA at No. 111 Guangzhong Road, Shanghai, tel. (86) 21 5665 0674 explained that BY4AA is the main club station in the city. (Have your hotel write the address in Chinese if you plan to make the trip by taxi to this or any club station.).

Browsing through the logbook of BY4AA is like scanning the pages of the "International DX Callbook". There are call signs and comments from amateurs around the globe who have visited China's largest city and operated the main Shanghai club station of the Chinese Radio Sports Association, (CRSA).

Founded on April 3, 1964 – and celebrating its 40th anniversary in 2004 – the CRSA's paramount goal has been to popularise amateur radio activities in China. While early endeavours concentrated on developing radio sports, notably high speed telegraphy and amateur radio direction finding, the past 25 years has seen the organisation helping schools and youth centres train newcomers in radio communications. During much of the past 2-½ decades the CRSA has also been involved in setting up club stations across much of the People's Republic. Today there are more than 150 club stations.

There are two requirements to set up any amateur radio station in China. The operator must have an "Operator's Certificate" which can only be obtained after successfully passing an examination. As well, the operator must have a "Station Licence" to own and operate transmitting equipment. Because China has not signed a reciprocal agreement on amateur radio operations with any country, foreigners cannot obtain a station licence. Consequently, they are not allowed to set up their own stations. *"However after obtaining an 'Operator's Certificate for Visitors' foreign amateurs are permitted and warmly welcomed to operate the many Chinese amateur radio* club stations", Mr. Chen Yun Chang, General Secretary Engineer, BY4AA, told me through an interpreter.

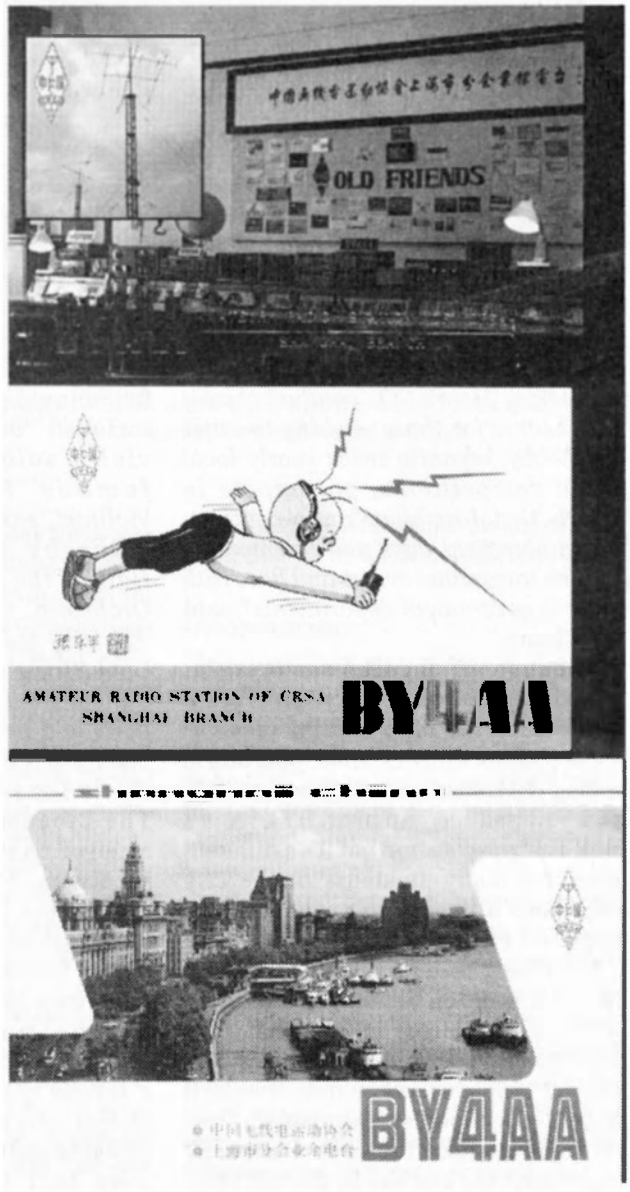
The procedure to obtain an "Operator's Certificate for Visitors" has been greatly streamlined in recent years. Today there are only four simple requirements to obtain this document:

1. A copy of the document page of your passport.
2. A copy of your home amateur radio licence.
3. A passport size photo.
4. An application fee of about $7.40.

These items need to be sent to the Chinese Radio Sports Association, PO Box 6106, Beijing 100061, P.R. China. For further details e-mail crsa@hellocq.net

According to official figures there are 900 licensed members of the CRSA. In addition, the CRSA has around 8400 associates; the rest are SWL members or radio enthusiasts. The annual membership fee in the CRSA is about $1.65. It costs about $3.30 for a year's subscription (4 issues) to the society's amateur publication.

The State Radio Bureau, a government agency within the Ministry of Information and a body similar in operation to our ACMA - issues station licences to Chinese citizens. The CRSA, on the other hand, an organisation similar to the WIA, conducts regular training courses in many cities and is responsible for conducting the exams. The cost for an Operator's Certificate (including the examination) and the station licence fee (including the inspection of transmitting equipment) varies between grades of certificate and



BY4AA sends these colourful QSLs to acknowledge radio contacts around the world.

Thomas E. King, VK2ATJ, discusses amateur radio with Mr. Chang at BY4AA.

locality of the inspection. However, it is normally less than $18.

There are five grades of Operator's Certificates. Levels 1 and 2 allow access to all amateur radio bands with powers levels of 100 W and 1000 W, respectively.

"In addition to meeting and assisting foreign amateurs, officers at BY4AA coordinate amateur radio activities at the other club stations in the city, send reports to the quarterly CRSA magazine, 'Ham's CQ', conduct classes and exams for those wishing to enter the hobby, organise twice yearly local radio competitions, participate in international amateur radio contests, coordinate field days and orienteering hidden transmitter events and liase with various government departments", said Mr. Chang.

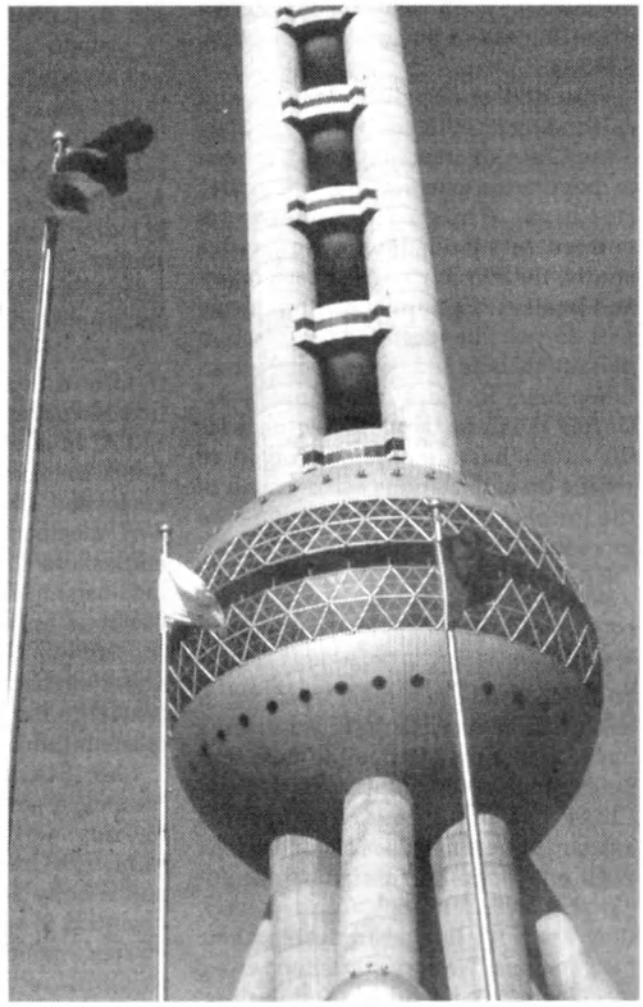
Because of BY4AA's excellent relationship with city and state authorities the club station receives some sponsorship, he noted, pointing to a long desk stocked with imported HF and VHF radio equipment. BY4AA is a well-equipped station but it's a different story for many amateurs in the city who have a licence but cannot afford imported equipment.

Mr. Chang made a plea to readers of Amateur Radio on behalf of an increasing number of amateurs in Shanghai. "We want to buy your older but still usable HF and VHF amateur radio equipment if it can be obtained at reasonable prices, he said. Contact the club station by mail using the address in the call book (P.O. Box 205, Shanghai) or by e-mail at by4aa@21cn.com

Shanghai has had a long association with wireless communication. In fact, the city is the birthplace of China's broadcasting service. It was on January 23, 1923 when technicians employed by the Osborn Radio Station climbed to the rooftop of the Dollar Co. to commence the first radio broadcast. The one hour and five minute program included *"overtures, violin solos by a famous Prague violinist, saxophone solos by George Hall of the Carlton Orchestra, chamber music by the Golden Gate String Quartet, dance music, local news and news from other parts of China, the USA and Europe."* The broadcast was received on some 500 receivers. Many of these were built by radio enthusiasts.The station founded by an American journalist by the name of Osborn operated on a wavelength of 200 metres and a power of just 50 watts. There were only a dozen or so radio stations in Shanghai before 1931. By the end of 1932 the number had escalated to 49. Most of them were operated by local Chinese.

Soaring 468 metres and built in a unique design of interconnecting balls and columns to give the impression of pearls dropping onto an emerald plate, the Oriental Pearl TV Tower is the third highest such structure in the world. (Only the 553 metre CN Tower in Toronto and the 535 metre Moscow TV Tower stretch higher into the stratosphere.)

Though it has an array of equipment to serve the transmission requirements for the city's 10 radio stations and 9 TV channels, tourists come to admire the sleek concrete and pink glass construction and look over the sprawling city from its lofty observation deck positioned some 263 metres above the wide streets of ultra modern Pudong.



There are great views from the Oriental Pearl TV Tower, the third highest in the world.

China: Ham Hints and Travel Tips

Flights:

The country's flag carrier, Air China, has daily non-stop Boeing 777 flights between Sydney and Shanghai, the entry point for an increasing number of Australians visiting China. The country's flag carrier connects Melbourne and Shanghai three times a week. (More than 245,000 Australians visited the People's Republic in 2003.)

For details of flights, fares and specifics about other destinations on the network contact Air China, Level 11, 115 Pitt Street, Sydney, NSW 2000, tel. (02) 9232 7277, fax (02) 9232 7465, e-mail: sydddca@airchina.com.au.

Accommodation:

There is a vast range of accommodation in the city ranging from simple but comfortable guest houses to swank, high-rise hotels comparable to the best in the world. Located opposite the Shanghai Stadium, minutes from a multi storey shopping centre filled with computer software and hardware and only metres from a station on the efficient and low cost metro line, is the Hua Ting Hotel & Towers, tel. (86 21) 6439 1000, e-mail: huating@huating-hotel.com. Next to this 1008 room hotel is the more modest but very comfortable Hua Ting Guest House, tel. (86 21) 6439 1818, e-mail: htghmo@sh163e.sta.net.cn

Shopping:

The Chinese do not yet manufacture amateur radio equipment although their domestic electronics industry is staggering in size and scope. There are, however, a number of markets devoted to selling test equipment, components, tools and consumer electronic products.

The computer market not far from the Hua Ting Hotel is within the Meiluo Shopping Centre. Get off at the Xujiahui metro stop. The largest electronics market, however, is on Beijing Dong Road not far from the No. 1 Department Store in the central city. Get off at the People's Square metro stop. This is the same stop for the wondrous Shanghai Museum with its priceless treasures from the Silk Road and a grand theatre where you can see Shanghai's awesome acrobats.

Nightlife:

You can easily spend all of your evenings spinning the dials at BY4AA or one of Shanghai's many other club stations. Or you can enjoy the 24/7 city after the sun goes down. Stroll down the busy Bund when floodlights illuminate the many old buildings, dine on a choice of cuisines in Face, a former mansion from 1936 or cruise the Huangpu River and see the spectacular Oriental Pearl Tower glisten in the night sky.

Tours:

Some Australian travellers opt to explore China on an independent basis with only air flights, transfers and hotels confirmed before their departure. This ensures sufficient free time for operating amateur radio club stations found in virtually all major centres.

Many of Shanghai's buildings from the 1920s and 1930s can still be seen on the Bund.

Numerous escorted holiday packages are also available in Australia that feature Shanghai as the sole destination or include the metropolis in combination with other Chinese cities. For instance, Helen Wong's Tours has a 4-day China Encounter package in Shanghai for travellers wanting an introduction to the city and its amateur radio opportunities.

In addition, a 13-day China Odyssey Tour includes the highlights of Shanghai, Guilin, Xi'an where the Silk Road started, and the not-to-be-missed Beijing with its multitude of attractions. Prices start from $2740.

For a detailed 52 page 2004/2005 China brochure see your travel agent or obtain a copy direct from Helen Wong's Tours, Level 17, Town Hall House, 456 Kent Street, Sydney, NSW 2000. Enquiries can be made by calling 1 300 788 328 or emailing hwtaus@helenwongstours.com. Log on to www.helenwongstours.com

Information:

Start planning your itinerary of Shanghai and other parts of China with free brochures, maps and travel advice from the China National Tourist Office, 11th floor, 234 George St, Sydney, NSW 2000, tel. (02) 9252 9838, fax (02) 9252 2728, e-mail: chinainfo@cnto.org.au. Log on to www.cnto.org.au

Additional detailed information on the city is available from the Shanghai Municipal Tourism Administrative Commission, tel (86 21) 6439 8947, fax (86 21) 6439 1519. Log on to www.tourinfo.sh.cn. This friendly fact-filled office can also supply details of other markets and bazaars that will be of interest to radio amateurs, short-wave listeners and computer enthusiasts.

ar

New lights in the sky

Earth generated radio lights up the ionosphere

Bill Isdale VK4TWI

At 06.41 UTC on 10th March 2004 near Gakona, Alaska, about 200 kilometres north from Valdez, a new light in the heavens was visible to the naked eye. Speckles of light with a wavelength of 557.7 nm, giving a colour towards the yellow end of the green part of the spectrum of visible light, were observable for 7.5 seconds and then disappeared for 7.5 seconds at an azimuth of 204° and an elevation of 75°. They were observed to be in the E layer of the ionosphere and at an altitude of 100 km. The speckles were contained in an area of 26 by 37 km.

This phenomenon was produced by the High Frequency Active Auroral Research Program, HAARP, a United States military project. The ionosphere was illuminated by the radio frequency energy beamed up by HAARP, 95 Megawatts on a frequency of 5.95 MHz. The half power contour of the beam produced the visible response from the E layer. Scientists Todd R Pedersen of the Space Vehicles Directorate, Air Force Research Laboratory and Elizabeth A Gerkin from the Department of Electrical and Computer Engineering, Cornell University published the results of this experiment in the journal Nature on 3rd February 2005.

This was not the first time that an artificial aurora had been created but was a first for radio induced optical emissions bright enough to be seen with the unaided eye.

Influencing the ionosphere has a history. Above Johnston Atoll, a remote Pacific Ocean location, Operation Hardtack 1 was carried out at 12.30 AM on 12th August 1958. The operation involved launching a rocket carrying a 3.8-megaton W-39 thermonuclear warhead to evaluate it for use as an anti-ballistic missile defence. Detonated at about 40 km altitude, above the pressure of most of the atmosphere, the warhead, codenamed Orange, produced a display looking like a golden bowl with a pink and blue corona above it. It also produced something unexpected. High frequency radio communications around Australia were blacked out for nine hours and the electromagnetic pulse destroyed electronics on the island. This made some people think.

It certainly didn't make many people talk. Cold War information security was in place and there was no explanation for the loss of radio communications at frequencies which depended on the ionosphere for propagation. What had happened was, reduced to its essentials, quite simple. The detonation had produced a lot of energy which radiated into the ionosphere over a wide area. The initial pulse of electromagnetic energy had fried local electronics within line of sight and sent out a lot of noise at radio frequencies, but that was a short duration effect. The disruption of the ionosphere lasted much longer.

The physics operating here is that high energy x-rays and gamma rays collide with gas molecules in the upper atmosphere and break the molecular bonds, producing charged particles. Liberated electrons are pulled along the lines of force of the Earth's magnetic field. As they move and accelerate through the magnetic field, a low frequency electric field is produced which reflects from the ionosphere and propagates around the planet. The accelerating electrons produce increasing frequencies until the disruption extends throughout a

broad high frequency band. Although the potential would be less than a millivolt per metre, large voltages will be induced in long cables such as power and telephone lines.

The Earth's magnetic field pulls charged particles into the Van Allen radiation belts which surround the planet in a toroidal shape, the inner belt starting about 600 kilometres above the Earth. The charged particles will be gradually pulled into the belt and the ionosphere will stabilise.

The unexpected effects from the detonation of Orange led to a more specific test, Operation Fishbowl, again from Johnston Island. The device, Starfish Prime, was detonated at 12 am on 9th July 1962 after a Thor ballistic missile carried it to an altitude of 400 km. The detonation created a light green artificial aurora which lasted for about a second before turning to a red, due to the excited oxygen atoms, which persisted for seven minutes.

Circuit breakers tripped out from induced over-voltages and cut the electricity on Oahu Island, Hawaii, 1300 km away. The W49 warhead was set to deliver its lowest yield, 1.4 megatons. It could have been adjusted to deliver up to 5 megatons. Local radio and telephone systems on Oahu failed for a short time. This was anticipated, but it was not over yet. The clouds of charged particles were at the altitude where low earth orbit satellites were operating. Those days there were only a few, but over several months seven satellites, a third of the fleet, were heavily damaged. It was like bringing the Van Allen radiation belts to the satellites; they were cooked.

Operation Fishbowl continued with the detonation of the Checkmate device at 145 kilometres above Johnston Atoll at 11.30 pm on 19th October 1962. With a yield of about 60 kilotons it made a green and blue sphere surrounded by a red ring. Above the atmosphere there is no fireball. This test of a smaller weapon indicates a realisation that the effects could be studied locally without creating widespread disruption to power and radio, and without wiping out your own satellites. In August 1963, the Limited Test Ban Treaty was signed by the US, the UK and the USSR banning nuclear testing in the atmosphere, oceans and outer space. The treaty was ratified into US domestic law on 7th October 1963. Edward Teller, remembered as the father of the hydrogen bomb, testified to the US Senate that, *"if you ratify this treaty...*

you will have given away the future safety of this country".

Large scale manipulation of the ionosphere has given way to smaller scale experiments with limited energy. The E-Bomb is a demonstration of the ability to apply conventional explosives to produce an electromagnetic pulse for local effect to turn off the lights and communications.

Moving to low altitude use of low powered devices is a natural progression, since a large disruption of the ionosphere will be likely to wreck many of the approximately 250 satellites that are in low orbit, providing military and civilian communication and other services. The large and immensely costly photographic surveillance satellites are in low orbits as are the iridium communications satellites.

Shielding orbiting electronics with Faraday cages and designing for tolerance to electromagnetic pulse will add weight and cost as well as reduce bandwidths of components that then have to be redesigned to meet specifications. Civilian operators won't pay the enormous cost of a satellite able to withstand what will probably never happen. To cope with the energy from more likely events, such as severe solar activity, they are more likely to temporarily shut down vulnerable equipment and orientate the satellite to face away from the direction of the radiation. That works only for predictable energy disruptions, but the sun is carefully observed and warnings of its activity are distributed widely. In the event of radiation damage to a satellite, there is nothing to be gained by quickly launching a back up, it will be damaged as well. There is nothing to do but wait for the disturbance to settle, unless of course the ionosphere could somehow be stabilised.

If it works, it will most likely never be used. It will sit quietly as a disincentive, a deterrent that has no obvious potential for harm even if used; which is probably a good reason to build it.

The dangers of electromagnetic disturbances at high altitudes are well appreciated by military organisations. On 25th January 1995, a four-stage Black Brandt X-II research rocket was launched from Andoya Island, near Tromso, Norway. The procedure for notifying the Russians of the intention to do this wasn't working awfully well.

Russian radar stations identified this as a Trident missile launched from a submarine off North Cape and issued an attack warning. The Russian General Staff believed the eight W-88, 475 kiloton warheads carried by a Trident missile would be detonated high over their country to blind their radars and jam communications so as to provide cover for a full-scale attack.

Then President Yeltsin, Defence Minister Grachev and chief of the General Staff, General Mikhail Kolesnikov, conducted a three way video conference until, after eight minutes, radar tracking showed that the trajectory of the rocket was taking it to a splash point off Spitsbergen, not over Russia. An unfortunate misunderstanding did not result in a disastrous response, illustrating the old adage that he who hesitates is sometimes saved.

Clearly, HAARP, being a military project, must have a military purpose or it wouldn't get any funding. Why heat up the ionosphere? An answer may be in the basic behaviour of charged particles in magnetic fields, specifically the geo-magnetic field. The dipole field naturally directs charged particles, be they from the solar wind or an artificial source, to the poles. When such a particle nears a pole it slows until it stops and is reflected out along the field line it is on. The point of reflection is called its mirror point.

The altitude of the mirror point is determined by the angle between the linear motion of the particle along the magnetic field line and its spiral path around the field line. A particle which is more or less parallel to the magnetic field line can reach its mirror point at an altitude low enough to collide with gas molecules and lose energy, giving an aurora. This is more likely below 100 km from the surface. Higher than that, the particle will remain free to rebound. The aurora is bleeding excess energy out of the ionosphere.

If that natural process could be enhanced, disruptions of the ionosphere could be stabilised more quickly than would occur naturally. In research conducted in the 1970s and 1980s, scientists from Stanford University used very low frequency radio energy, below 20 kilohertz, and beamed it into the Van Allen belts from a transmitter relatively near the South Magnetic Pole, which was over the ocean at the time.

They sometimes caused resonance. HAARP is doing this. By turning its high frequency transmitter on and off it changes the temperature, and therefore the conductivity of the auroral electrojet. This modulates it to produce extremely low frequency or very low frequency waves to nudge the charged particles out of orbit so that they dissipate their energy into an artificially enhanced aurora which will ground the energy that would otherwise damage satellites. If such a system can be made practical, then it would be the functional equivalent of running a giant cable up to connect the "polluted" band of space to the ground and suck the energy out of it before it could damage valuable satellites. The damage from the tests in the 1960s took months to occur so correcting the cause in days or weeks could be sufficient.

The cost of such a project would have to be economical compared to the immense cost of hardening satellites. It can be located on the ground where it is easily and relatively cheaply built, maintained and upgraded. It only needs to be turned on if required. Its existence means that hostile manipulation of the ionosphere will not be effective so there is no reason for anyone to do it. If it works, it will most likely never be used. It will sit quietly as a disincentive, a deterrent that has no obvious potential for harm even if used; which is probably a good reason to build it.

With no military advantage to be had from disrupting the ionosphere we can be confident that it will be there when we need it.

Selected references

1. Nuclear Explosions in Orbit. Daniel G. Dupont. Scientific American June 2004, pages 68 to 75.
2. Weapons of Mass Destruction. Robert Hutchinson. Cassell, 2004, pages 21-22.
3. 100 Suns 1945-1962. Michael Light. Alfred A. Knopf. 2003.
4. Artificial auroras from Alaska. Nature, vol. 433 3 February 2005 pages 498- 500. Todd R. Petersen and Elizabeth A. Gerkin.

ar

Sitting at history

Mawson of the Antarctic's desk supports amateur's radio

Allan Doble VK3AMD

We dream of finding treasure maps in antique furniture. 'Snow' Campbell VK3MR found some papers at the back of an old desk he bought in 1930. This was treasure of a different sort. He had bought the desk that had been Sir Douglas Mawson's workplace during his Antarctic explorations.

This story started in September 1987 when I was at a luncheon, which the Radio Amateurs Old Timers Club holds twice a year. I was sitting next to my friend, Myrvin 'Snow' Campbell, a long time amateur radio operator like myself. He was known all over the world by his call sign VK3MR. In conversation he mentioned that the desk on which his radio gear was assembled had been bought by him at Beecham's Auction Rooms in Melbourne in 1930, and that it had come from the ship "Aurora" used by Mawson in 1911/1914 and later Shackleton in 1914/1916.

Mawson's name was apparently mentioned at the auction. Snow bought it because it was the size he wanted, not because it had historic value! When he got it home he pulled out a drawer that would not close fully and found a mass of paper behind it. When Snow told me the story I urged him to write his story and let us have photographs, which he did.

We published the story and photos in the RAOTC magazine OTN (Old Timers News) in March 1988 (issue No 20). At that time I made up my mind that, if I lived longer than Snow, I would do all I could to make sure that the desk would live longer than me and, if possible, be given to the Australian Antarctic Division for preservation and display.

The mass of paper 'Snow' found behind the desk drawer consisted mainly of letters written while the "Aurora" was trapped in the ice, and which, sadly, had not been posted when Shackleton left the ship.

More importantly for this story is the fact that the rest of the paper was over 400 hand written pages, combining a day to day diary and copies of radio messages exchanged with other ship and shore stations during the period 1st January 1915 to 16th April 1916. The radio operator on Shackleton's expedition was Lionel Hooke (later Sir Lionel Hooke) who, in 1930, was the Manager of AWA in Melbourne, and was the writer of the documents.

'Snow' Campbell handed in the letters and the other documents to the AWA office for Lionel Hooke, who was overseas at the time. When he returned to Melbourne, Mr Hooke wrote to 'Snow' on an AWA letterhead, thanking him for this action. 'Snow's' family still have that letter which proves that the desk was indeed from the "Aurora" and therefore had a unique place in Australian Antarctic History.

So it was assumed that the documents might have been held by him or the AWA company. They were, in fact, handed to the Mitchell Library section of the NSW Public Library early in 2001. The man who brought them to the Library was none other than Mr John Hooke, the son of Lionel Hooke.

John Hooke quite naturally believed that his father had possessed them since leaving "The Aurora" in 1916. Mr. John Hooke was understandably surprised that they had been in the desk from 1916 to 1930.

I was able to send John Hooke a copy of the issue of OTN magazine No 20, March 1998, in which Snow Campbell told the original story about his purchase of the desk. This magazine also contained a copy of Lionel Hooke's letter to Snow Campbell thanking him for the gift of the documents.

When Shackleton came back to Australia late in 1916 he sold the ship in Sydney. In 1917 the 'Aurora" set out for South America with a cargo of coal. It was never seen or heard of again, and is presumed to be somewhere at the bottom of the Pacific. While people must have wondered what had happened to it, no one ever wondered if any part of it had survived, let alone the interesting double sided desk that had been used by Mawson and his ship's captain in

Photo 1: The Governor General signing the VIP visitor's book.

Photo 2: Marjorie Campbell and Allan Doble with His Excellency.

1911/1914, and by Shackleton and his ship's captain in 1914/1916.

'Snow' Campbell died on 28th December 2000. I spoke with Snow's widow Marjorie and his family, who were well aware of the desk's historical importance, and suggested they think of locating it at Antarctic Division Headquarters in Kingston near Hobart. 'Snow's' family liked the idea and authorised me to open negotiations.

I spoke with Mr Andy Smithers, the Antarctic Division's librarian and curator. He was surprised when I told him that the desk used by both Mawson and Shackleton on the "Aurora" not only existed, but that it was in my power to arrange for it to be a gift to the National Antarctic Division, if it was wanted. Of course, it was wanted. There were to be two very strict conditions to the gift.

One, it would be on permanent display in a prominent place (most museums have more material than display space and rotate items). Two, on the desk woud be the story of its origins and the name of the giver. The appropriate letters were exchanged by Mrs Marjorie Campbell and the Antarctic Division, but it was a few months before Mrs Campbell and family finally told me they were ready to let the desk go.

A carrier was located who drove around Hobart collecting goods, ferried them to Melbourne, where he made deliveries and then collected goods. He collected the desk from the Campbell home near Frankston, and delivered it to Antarctic Headquarters about 24 hours later. The Division paid the freight. The desk did not go on display until February 2004 because of planned alterations to the main building where it would be displayed, and the erection of three new buildings, a program that was only completed in 2004.

Since 1997, all had wondered what had happened to the documents given to Lionel Hooke by 'Snow' in 1930. About three years ago I found that AWA in Sydney (the firm that had supplied Mawson with his Marconi and Telefunken radio equipment on his way to the Antarctic in 1911) had ceased all manufacturing and trading in the field of radio and all their business documents covering their long history were in sealed boxes in the Mitchell Library section of the State Library of New South Wales.

I had several telephone conversations with Executives of AWA and several exchanges of correspondence regarding my search for the documents handed to Lionel Hooke in Queen Street in 1930, in the hope that they might be known to be in one of these boxes, perhaps among personal papers of the late Sir Lionel Hooke.

The company had no knowledge of the documents but, very graciously, sent me a letter authorising me to search for them among the sealed boxes if I so desired, together with a copy of a letter to the Mitchell Library authorising them to allow me to make the search.

I did not feel up to the task and so did not take up the offer, but around this time I had some exchanges of correspondence and telephone conversations with Ms

Photo 3: *Back row* (from left to right): Margaret Smith (Doble), Mrs Mariena Jeffery, Ms Campbell, Ms Campbell

Middle Row: Mrs J Campbell, Allan Doble, John Campbell

Front Row: His Excellency Major General Michael Jeffery AC, CVO, MC (Ret'd) and Mrs Marjorie Campbell

Meredith Lawn, the Librarian of the appropriate section of the Library.

Late in December 2001, Ms Lawn rang me and said, "we have your documents - they are from Shackleton's expedition and written by Lionel Hooke". Minutes later I was on the phone to Andie Smithers in Hobart to tell him the Library would be willing to make copies available to the Division. Therefore, it came about that a book made of reduced size copies of the 400 or so pages is on permanent display on the desk on which they were written all those years ago.

Friday, 13th February 2004, was the 50th anniversary of the date on which Philip Law landed his expedition on the Antarctic coast and set up Mawson base. On that date this year the Governor General, Major General Michael Jeffery, was at Antarctic Division Headquarters at Kingston, a suburb of Hobart, to name and to declare open the three new buildings and the refurbished building in which the desk is on display a little way inside the front door. Mrs Marjorie Campbell and family, and myself with one of my daughters, were there by invitation from Canberra.

His Excellency the Governor General was very interested in the desk, its history and the story leading to its present location. He had a brief chat with us early on, and then a longer talk before he left after he and his good lady had signed the special VIP visitor's book, open on the desk. He held up the proceedings for a few minutes on his tight two hour schedule. On the desk there is a card which tells the story of the desk. Also on the desk is a frame. On the left side of the frame is the letter from Marjorie Campbell telling about 'Snow's' RAAF and POW experiences, his purchase of the desk and her gift of it to the Nation.

The right hand side of the frame shows 'Snow' in front of the desk and his rig back in 1930. The background to the photo (which was published on the front cover of OTN magazine No 20 in March 1988) is a typical array of QSL cards from all over the world. His Excellency picked up and read the card, moved along and read the letter, studied the picture, and then had a short question and answer session with us while his official party waited. He was impressed and delighted with the fact that the historic desk had not only been found and preserved, but that it was a free gift to the Nation. His parting words were that he considered this to be a wonderful example of public spiritedness, and with that he resumed his journey to his waiting car.

The still outstanding mystery is where and how the desk, with its slightly open drawer, remained undisturbed from 1916 when the ship was sold until 1930 when 'Snow' Campbell bought it at auction. It is only a guess but I have often wondered if it may have been taken ashore from 'The Aurora' by Captain J K Davis who came to Melbourne and became the Director of Shipping in Victoria.

Footnote: During his formal address his Excellency pointed out that Australia now controls 42% of the Antarctic continent, a land mass nearly the same size as Australia.

ar

The Wireless Institute of Australia

ACN 004 920 745

Election of Directors

Call for Nominations

Pursuant to clause 14.1 (c) of the Constitution the WIA Board has determined that the election of directors shall be conducted by postal ballot.

Three directors appointed by clause 12.6 (b) of the Constitution retire at the conclusion of the next Annual General Meeting which will be held at a time and a place to be announced but not later 31 May 2006, namely Philip Wait, Edward Thrift and Trevor Quick. Each is eligible for re-election and each offers himself for re-election.

Nominations are called for from others also seeking election as a director of the WIA.

A director must be a voting member of the WIA and must hold an Australian amateur radio licence.

Any person wishing to nominate as a candidate for election as director of the WIA must deliver or cause to be delivered to the Returning Officer by not later than 31 January 2006:

A statement signed by the candidate signifying his or her willingness to be a candidate for election as a director together with;

the full name, age, occupation and callsign of the candidate, and

such other biographical details or other information as the candidate wishes to accompany the ballot papers, but in all not exceeding 250 words.

Delivery to the Returning Officer may be made by hand when the WIA national office is open at:

Suite 10, 229 Balaclava Road,
Caulfield North,
Victoria 3161

or by mail to:
PO Box 2175
Caulfield Junction,
Victoria 3161.

Nominations received by facsimile or by electronic means cannot be accepted.

David A Wardlaw, VK3ADW
Returning Officer

To DX beyond the western sky

IOTA on Dirk Hartog island

Nigel Dudley VK6KHD

"Go west, young man".

In Australia this exhortation would lead you to Dirk Hartog Island, the western most point of Australia, which is where this intrepid bunch of DXers found themselves.

Photo 1 - Campsite at Louisa Bay on the east side of the island about 40 km from the landing point. Low scrub and sandy but excellent fishing and easy to erect antennae.

An IOTA activation is a good chance for the average amateur to hone up his skills as an operator, camper and general adventurer, especially when the activation is a "wanted" one. Degrees of difficulty in getting to islands vary from the simple to the totally crazy. The islands off the Western Australian coast present the full range of challenges such as Rottnest which is simple, to the extreme like some of the groups off the Kimberly coast that have been activated over the last few years. Dirk Hartog probably lies somewhere in the middle.

Photo 2 - The low band operating tent with the Force 12 Sigma XK40 antennas in the foreground. One is set for 20 m and the other for 40 m to allow quick change over.

Dirk Hartog Island is the most westerly part of Australia. Separated from the mainland by a narrow passage of water about one kilometre wide, it is about 70 km long and averages about 10 km wide. The first European foot was in 1616 when Dutch sailor Dirk Hartog landed at what is now known as Cape Inscription and left an inscribed pewter plate with details of the visit. First European occupation was in 1869 when a pastoral lease was granted and a thriving wool industry established which continued until the late 1960s. The Wardle family purchased the Island and the number of sheep was reduced until, today, pastoral activities have ceased and the Island is an eco-tourism destination run by the family. From July 2006 the island will be managed by CALM, a Western Australian government instrumentality, as a conservation area with the family retaining a small private holding.

The island is wild, wind blown and an experience. With no public access and no made roads, only rough tracks, current policy is that only eight visiting vehicles are allowed at any time. These must be 4WD with good ground clearance. Access is by a barge operated by the Wardle family and must be booked well in advance.

The island falls within the West Australian group for IOTA having the designation of OC 206. Wally VK6YS, after other successful island activations that included Browse OC-234, Pasco OC-071, Viney OC-266 off the Kimberly coast, and Breaksea OC-243 off Albany in the south, decided that Dirk Hartog was the next good candidate for activation as its standing in the IOTA "most wanted" list was high. Dan VK8AN, a veteran of the previous expeditions, and Nigel VK6KHD, who had participated in the Breaksea activation, agreed to come along. Jane, Nigel's XYL also agreed on

the condition she was allowed to fish and not be bothered by the radio stuff!

Our plan was to spend a long weekend on the Island, hopefully to work as many contacts as possible coinciding with the weekend openings into North America and Europe. Dan flew down from Darwin to Perth on the Thursday before the weekend and we set off early on the Friday morning in two vehicles loaded with supplies and radios. A nine hour drive from Perth saw us at Steep Point late on the Friday evening in anticipation of crossing the following morning to the Island. The drive to Steep Point is not for the faint hearted as it is 750 km from Perth with the last 100 km being dirt road, 30 km of which is 4WD only and very corrugated in places.

Early on Saturday morning the barge picked us up and we made the crossing. The barge takes only one vehicle at a time, loaded from the beach and after a crossing of about 15 minutes landing is made on the island, also on a beach. With both vehicles safely offloaded we set out for the homestead and eventually the designated camping grounds. We settled on setting up camp at Louisa Bay

Photo 3 - The operators - from the left Wally VK6YS, Nigel VK6KHD and Dan VK8AN complete with IOTA flag given to Wally by the RSGB IOTA after a previous expedition.

Photo 4 - Wild flowers were in abundance as a result of good winter rain. Travelling on the island was a visual delight.

about halfway up the Island. The choice was dictated by being able to get close to the sea and it being relatively sheltered, although when the wind blew from the east it was a different story!

The camp consisted of two operating stations. One station operated on the lower bands using an Icom IC706 Mk2 and Force 12 Sigma XK40 antenna. This antenna is a ground independent, centre fed vertical dipole used successfully on previous expeditions; it has the advantage that two can be set up to provide gain and directivity although this configuration was not used on Dirk Hartog. The second station was a Yaesu FT817 and Palomar amplifier into a half wave sloping dipole set against a 6 m aluminium mast and tuned to 15 m. After working several of these types of operations we are firmly of the belief that lots of power and gain antennae are not warranted. When the bands are open, and with modern alert systems via the DX cluster, etc, being the wanted station is no barrier to communication provided good operating practice is observed.

Photo 5 - Dan and Wally operating on 20 m. Note the lack of a Morse key. All transmitting was done via the keyboard, but receiving was strictly by ear!

Power came from batteries, backed up by a very reliable Honda EU20 generator. These generators are also economic to run as the 240 V is generated by a solid state inverter and engine revs are automatically governed to load. Fuel economy is important as we had to carry all fuel and water requirements, making for heavily loaded vehicles. Despite the solid state design, making the EU20 RF quiet is a challenge, especially under the low background noise conditions experienced in locations such as Dirk Hartog. Home-brew line filters using wire wound toroids were employed and this removed a lot of the noise, but the best filtering appeared to be simple 150 mm loops of at least six turns of the extension cable at strategic points along the power feeds.

A 64 watt solar panel topped up batteries. Laptop computers were used for logging and auto Morse code generation, powered from inverters with the radios from switched mode power supplies, or direct from battery; none of these gave interference.

We operated two stations as band conditions permitted. Although separated by only a few metres, cross band interference was eliminated by using band pass filters. The ICE filters were imported from the USA and have a 0.25dB injection loss for an out-of-band rejection of 35 dB. They were highly successful as one station worked away on 15 metres and the other on 40, 30 and 20 metres as if the other did not exist.

First contacts were made on the Saturday afternoon with openings into Europe and Asia on 20 and 15 metres. A scattering of VE stations also appeared but, by the early evening, the bands closed. Early on Sunday morning 40 metres CW was operated with mixed results and a move to 20 metres sideband was more successful. The greatest disappointment of the weekend was working 40 metres; time and time again we would be wiped out by contest stations in Europe simply treading over the top of our signal. Some might say that more power was needed but this probably would not have made much difference. The problem was the

Amateur Licence Reform – just in time?

A Linton-Harrison Report

Jim Linton VK3PC and Roger Harrison VK2ZRH

There are signs that the serious decline in amateur radio in Australia that has occurred since the mid-1990s may be turning back. While total Amateur licensee numbers are still declining, the rate of that decline is levelling off, thanks to a growth spurt in Novice Limited licensees since 2002 and also, surprisingly, in Limited licensees.

A new era in Australian Amateur licensing began on 19 October this year. The past five-tier licence structure is replaced by a three-tier licence structure that includes the promising new entry level Foundation Licence. Restructure had been widely anticipated for some years and seems to have influenced both prospective, existing and some former licensees, as reflected in the Amateur licensing trends since 2002.

Part of that change, the end of the mandatory Morse code proficiency qualification for access to the HF bands, which saw the introduction of HF privileges for Australian no-code licensees on 1 January 2004, had also long been expected. It, too, is reflected in the licensing data.

What happened?

Total licensee numbers peaked at about 17,500 during the early 1990s and levelled off. They began to decline from 1996, which has continued to the present. Table A tells the story.

Over the nine years 1996-2006, the Unrestricted Licensee numbers had a steep decline losing 1991, or 20.2%, the Novice ranks fell 934, or 43.5%

During this same period the Novice Limited gained popularity, adding 363 licensees, or 155.8%. The Intermediate and Limited licensee numbers fell, but nowhere near the numbers recorded for the Unrestricted and Novice.

In August 2003, the then Australian Communications Authority (ACA) issued its Discussion Paper "A Review of Amateur Service Regulation". From the resultant review process the Authority introduced HF privileges for former no-code licensees on 1 January 2004. In May 2004, the ACA published its "Outcomes of the Review of Amateur Service Regulation", which foreshadowed this October's new licensing regime.

Amateur licensee numbers from immediately before the ACA review and after the outcomes were announced – which we've dubbed "pre-Review" and "post-Review" – reveals some valuable lessons for us all before the impact of the new three-tier licensing structure takes effect. Table B tells the story.

Over the pre-Review – post-Review period, Novice Limited numbers rocketed by 240. This is two-thirds of the total growth for the licence grade since its introduction in 1995. Over this period, the Limited Licence regained popularity to such an extent that licensee numbers grew, adding 175.

continued next page

ACMA Amateur licence statistics	Oct 1996	Oct 2005	loss or gain	per cent
Unrestricted	9852	7861	-1991	-20.2
Intermediate	1397	1313	-84	-6.0
Limited	2973	2714	-259	-8.7
Novice	2148	1214	-934	-43.5
Novice Limited	233	596	363	+155.8

Table A. Amateur licensee trends, October 1996 compared to October 2005. From data published by the Australian Communications and Media Authority.(ACMA)

ACMA Amateur licence statistics	Oct 2002	Oct 2005	loss or gain	per cent
Unrestricted	8473	7861	-612	-7.2
Intermediate	1334	1313	-21	-1.6
Limited	2539	2714	+175	+6.9
Novice	1490	1214	-276	-18.5
Novice Limited	356	596	+240	+67.4

Table B. Amateur licensee trends, pre-Review (October 2002) compared to post-Review (October 2005). From data published by ACMA.

Dirk Hartog *continued*

total absorption of the other operator in trying to achieve his objective, and no regard for other operators trying to work the rare IOTA. Sunday saw ongoing QSOs throughout the day as conditions permitted, openings being patchy on 15 metres with 20 m the most reliable. The evening opening into Europe on 15 and 20 metres was good while it lasted and it was especially nice to hear operators remark, "Thanks for the new one"; it makes it all worthwhile. 15 metres was prematurely closed as a broadband "woodpecker" interference started up and we could not copy anything under its 9+ signal. The noise continued until the bands closed.

Propagation on Monday morning was again poor and the day was spent mostly relaxing, taking photographs and then packing up camp to move back to the landing point for the transfer back to the mainland the next day. A total of 562 QSOs was made over the two day operating period. A modest total perhaps, compared to other IOTA activations that we had participated in but, none-the-less satisfying. The thrill of working a dog pile when it happens is something every amateur operator should experience.

Further information on the Island is at http://www.dirkhartogisland.com.au/index.htm

ar

Intermediate licensee numbersfell marginally, but Unrestricted and Novice licensee numbers continued to decline significantly. Thirty per cent of the decline in Unrestricted licensees since 1996 occurred in the past three years.

Clearly, this picture indicates a maturing of the no-code Novice Limited licence as an entry point into the hobby and as a launching point for upgrading to the Limited Licence, which itself also gained popularity.

The Novice Limited growth was probably also due to an increased awareness over 2002-05 of its certain enhancement with HF privileges to come in the near future. It can be safely assumed that all 240 of the Novice Limiteds gained during this period were newcomers to amateur radio.

Similarly, Limited licensee numbers swelled as a result of anticipation of enhanced privileges. Most likely, a proportion of the 171 Limiteds gained over the pre-Review – post-Review period would have been newcomers, the remainder resulting from Novice Limiteds upgrading and lapsed licensees returning to the hobby. There is some evidence, both anecdotal and from on-air activity, that a notable number of lapsed Limited licensees have resumed their hobby, perhaps due either to changed personal circumstances or awareness of the increased scope for individuals now available in amateur radio.

Intermediate licensee numbers stagnated over 2002-05, although they gained identical privileges to Unrestricteds on 1 January 2004. This didn't seem to attract sufficient lapsed licensees to boost the numbers, or perhaps there haven't been too many lapsed Intermediates anyway.

The number of silent keys every year is a contributing factor to the decline in Unrestricted licensees. It affects all licence grades to some extent, now.

The graph in Figure 1 illustrates the whole picture, from when the decline in Amateur licensing began in 1996 through to October 2005, when the old five-tier licence structure ended.

The lessons

Was the review just in time to 'stop the rot' afflicting the hobby in Australia? If the decline in total numbers continued at the 2002 rate, in about 15 years for licensee numbers to fall below 10,000, if the rate of silent keys didn't accelerate. Would that few make the hobby unsustainable? There's no clear answer to that.

One lesson for the immediate future is to encourage lapsed licensees to return to the hobby, as the evidence in the case of Limiteds shows. Lapsed Novice and Intermediate licensees may return now that they're able to take up a Standard licence, with its enhanced privileges compared to what they had in the past. But they have to know about that. Publicity will be the key.

The effectof dropping the mandatory Morse code proficiency has is a clear signal. This, and access to more bands has engendered renewed interest, as the licensing data shows. These factors released a measure of pent up demand.

Australian amateur radio is not out of the woods, yet. However, the new Foundation Licence, offering a new entry level, seems to be building an encouraging level of interest. November estimates show some 400 people waiting for the new licence's introduction in October. That may translate into 1000 newcomers taking the Foundation Licence exam in the first full 12 months. This, together with the likely upgrading to occur over the short-term by Foundation licensees moving up to at least the Standard Licence, the decline in radio amateur numbers seems set to be reversed over coming years.

About the Authors:

Jim Linton VK3PC and Roger Harrison VK2ZRH released a discussion paper on the future direction of amateur radio that was published in Amateur Radio magazine. It was recognised by the WIA Publications Committee which gave them the Ron Higginbotham Award in 1985. They last wrote on the subject of the well-being of amateur radio in Australia with the Linton-Harrison Report "Amateur radio and the challenge of change", published in 2003. There was much discussion that continues today about its contents, which included research and analyses of the decline in amateur radio during the previous five to six years. It's available online at www.amateurradio.com.au/lintonharrison/

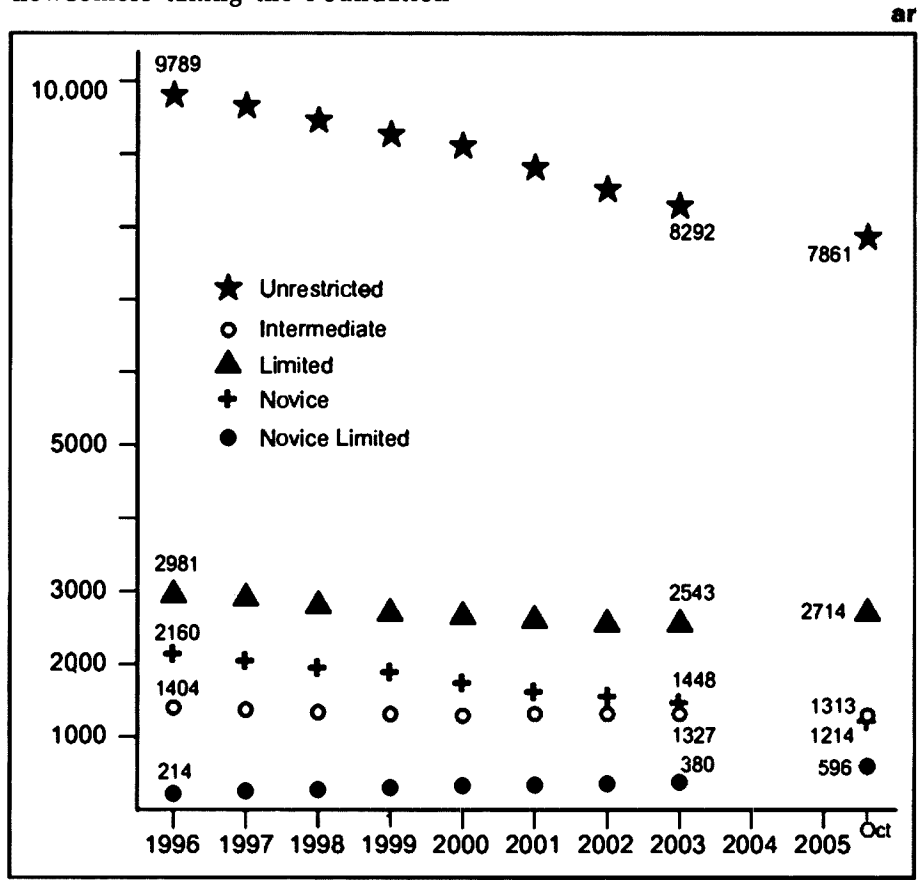


Figure 1. Amateur licensee trends, 1996 through 2005. The up-tick in Novice Limited and Limited numbers between 2002 and 2005 is clearly seen, while Intermediates hung-on. The rate of decline in Unrestricted and Novice licensees over the latter period is also apparent. Complied from data published by the Australian Communications and Media Authority.

Peter Gibson VK3AZL

An efficient tuner for small 160 meter verticals

Note:- 1 inch = 25.5 mm and 1 foot = 12 inches

In QST for April 2005, Robert Snyder, KD1VV describes another approach to making a short but efficient 160 metre vertical.

The problem described by Robert was to fit an efficient but electrically short vertical antenna for 160 metres in a relatively restricted area. The vertical wire was 35 feet high with a top-hat loading wire about 56 feet long. In addition there were four radials as a counterpoise, elevated 7 feet above ground and about 75 feet long. Even so, this is still a small antenna for 160 metres, only 0.065 wavelengths in height.

When using the EZNEC modeling program and inserting typical figures for local ground conditions as well as lossless wire, the antenna input impedance would be (6.5 –j530) ohm at 1.85 MHz. This corresponds to a Q of 80 with the 2:1 bandwidth being 18 kHz. If the antenna was tuned to 1.85 MHz using a loading coil of infinite Q, the loading coil would have a reactance of 530 ohm, and coupling to it could be accomplished either with a tap or link, to provide an impedance transformation to 50 ohm.

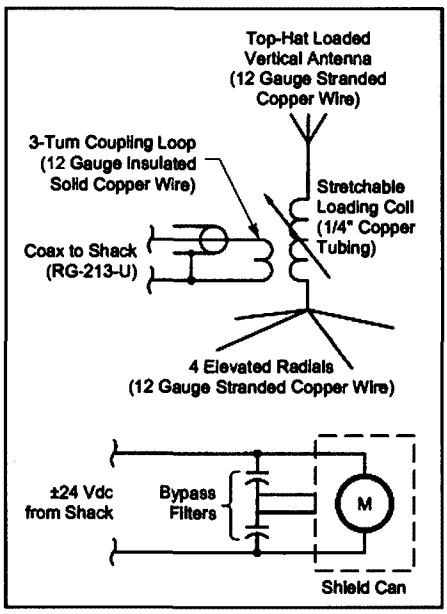


Figure 2 – Schematic diagram of antenna system with its remotely tuned loading coil, link coupling coil and elevated radials. The DC motor drives the jackscrew to stretch the coil

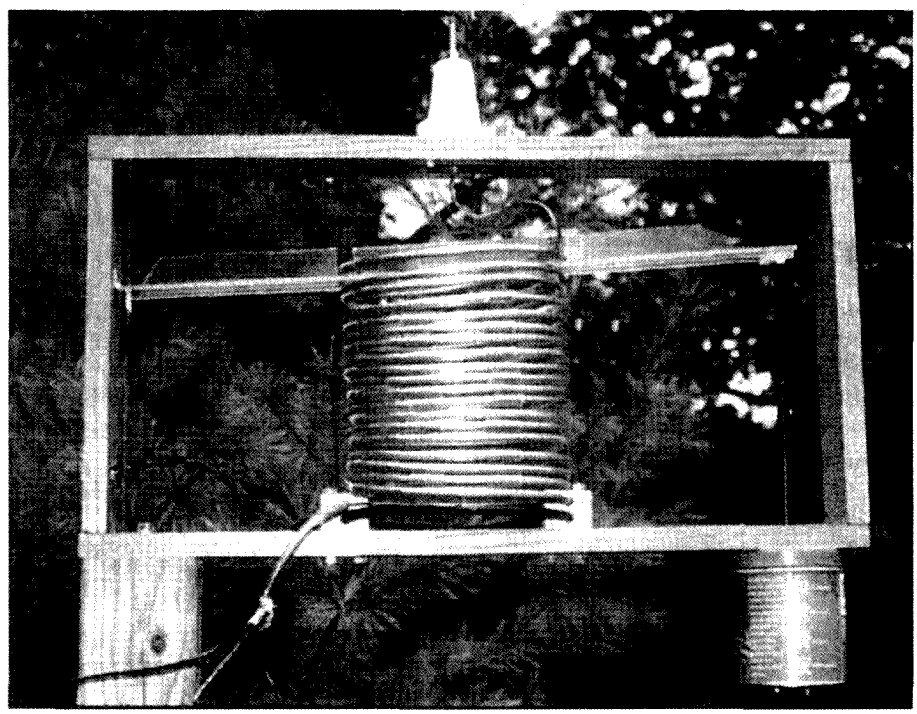


Figure 1 – The tuner assembly with the loading coil at mid position. Motor is in can at lower right

To avoid significant losses from the loading coil, its Q must be much greater than that of the antenna. It was determined that a 20 turn coil, 7 inches in diameter and wound with ¼ inch copper tubing, would have the inductance required (45.6 µH for 530 ohm reactance at 1.85 MHz) and Q in excess of 900 at 1.85 MHz.

The coil was wound around a 6 3/8 inch diameter cardboard tube, using ¼ inch tube to form a 20 turn solenoid. This required 40 feet of tubing, requiring two lengths to be joined. Silver solder would be best, but normal 60/40 soft solder was used here. The coil was then sprayed with clear acrylic lacquer to deter corrosion. A number of short lengths of ¼ inch ID clear vinyl tubing, slit on one side, were cut. These were then wrapped around the copper tubing at about ¼ turn intervals on every second turn, to prevent the turns shorting. A flexible lead was soldered onto the top end of the coil to attach to the vertical radiator through the top insulator.

This coil has enough inductance to tune the antenna down to 1.8 MHz when compressed under its own weight. Therefore, the rest of the band can be tuned if the coil can be stretched to reduce its inductance. This stretching is accomplished by a jackscrew and lever arrangement described below. A motor turns a threaded rod, which causes a nut to rise or fall, depending on the direction of travel. A plastic lever arm, attached to the top of the coil and hinged at the other end, is raised or lowered by this nut. Figure 1 shows the final arrangement in its wooden housing with the coil

stretched to about mid position. The plastic lever arm is suitably reinforced to prevent bending and is hinged at the left side. The threaded rod is on the right side with the geared down motor underneath in a metal shielding can.

Link coupling was chosen to couple the antenna to the 50 ohm coax line. This 3 turn coil is held in position about ½ inch below the loading coil, using two wooden blocks. The antenna is connected through a ceramic insulator to the top of the coil and the counterpoise is connected to the bottom end. Given the low radiation resistance, the high Q of this antenna and its good efficiency, RF currents and voltages can be quite high so good connections are a must and attention should be taken to the possibility of arcing. The schematic of the overall antenna system is shown in Figure 2.

The motor used was specified as a 30 r/min at 12 V dc. The speed is not too important, but the motor will need to deliver sufficient torque to stretch the loading coil fully. Given the high RF fields in the vicinity, it was considered prudent to put the motor in a metal container, as much for shielding as weather proofing.

It is important to minimize the amount of metal (especially ferrous) near the loading coil, as they could degrade the Q of the coil. The threaded rod is 3/8 inch diameter Delrin, hand threaded. The lever arm is plexiglass and most of the nuts and bolts are nylon. The nut and hinge are metal but don't seem to create any problems.

To provide protection from the weather, the housing shown in Figure 3 is made from corrugated plastic sheet. Any other material that is weather proof and non conductive should be suitable for a housing.

The tuning is conducted remotely from the shack with a power supply and reversible switch. The tuning is carried out at low power and the system tuned for minimum VSWR. Minimum VSWR is less than 1.1:1 across the entire tuning range.

ar

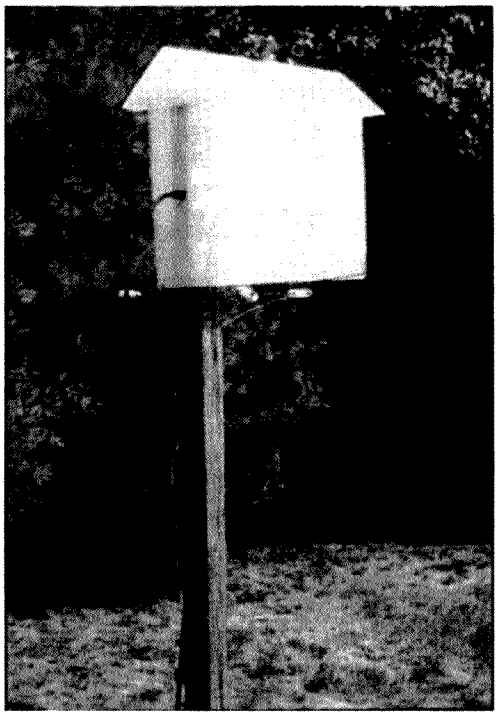


Figure 3 – The tuner assembly, enclosed in its weatherproof 'birdhouse'. The assembly is supported on wooden 4 x 4 post, which also supports the elevated radials.

TTS Systems Communications Equipment

TTS Systems www.ttssystems.com.au **FREE CATALOGUE**

HF and VHF Transceivers, Autotuners and Kits

Phone 03 5977 4808. Fax 03 5977 4801 info@ttssystems.com.au

WM1 Computing Watt Meter by Autek Research

A WM1 connected to a Ten-Tec Argonaut with the power adjusted to 10 watts

A versatile HF & 6 metre power meter. This clever instrument from Autek measures forward power while automatically calculating the VSWR using analog computing techniques. No knob to set forward calibration, it's all done for you. Simply set the power range and send some RF down the line. And even better! The sensing head is remote from the display, this removes the problem of heavy RF cables dragging your power meter all over the operating desk.

The WM1 was originally designed in 1986.In the Autek tradition, time was taken and they got it right the first time, and there have only been minor changes since. In 1991, The RF head was compensated to make it useable to 54 MHz. More recently the peak power decay time was increased in response to requests. Lastly, back lighting on both meters was included.

Thousands of WM1's are in use worldwide. It's time tested and the most popular unit of its type. We may be biased, but we really don't think it has any competition. You can pay a lot more and still not get computing SWR or any better accuracy.

Main Features

- **Simple to operate**
- **Three power ranges 20, 200 and 2000 watts**
- **Illuminated meters**
- **Peak or average power readings**
- **Frequency range 1.5 to 30MHz (usable at 50MHz)**
- **Usable down to 1W**
- **Power supply 9 to 18VDC 200mA**

VNA by TEN-TEC

USE YOUR PC AS RF VECTOR NETWORK ANALYSER

The first affordable access to many capabilities of conventional bench-top Network Analysers. Covers 200 kHz to 120 MHz. Test low power amplifiers, characteristics of coax cables, measure and adjust filters, check antenna impedance vs. frequency, antenna SWR, measure the length of transmission lines using TDR feature (Time Domain Reflectometer). The VNA measures forward/reverse gain and phase response of a circuit. Also measures input and output reflection (complex impedance) and provides S parameters. Make measurements of one-port networks (input, ground) and two-port networks (input w/ground, output w/ground). VNA also functions as general purpose signal generator. Frequency accuracy in either analyser mode or signal generator mode can be enhanced with use of customer provided external frequency reference.

Load the software on your Windows based PC and connect to a USB 1.1 compatible port.

All displays and plots are derived from these four measurements:•S21 Magnitude: gain or loss of two-port network from input to output. •S21 Phase: the transfer phase of two-port network from input to output.•S11 Magnitude: return loss of one-port or two-port network referenced to input of the network.•S11 Phase: the phase angle of return loss of one-port or two-port network referenced to input of network.

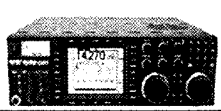
Specifications

Freq Range: 1 MHz-100 MHz at full spec. Operational with degraded perf. up to 120 MHz,down to 200 kHz.

Resolution: 0.1 dB for amplitude measurements 1 degree for phase measurements

Dynamic Range: in forward mode, 80 dB at lower frequencies 75 dB mid-range and higher frequencies In reverse mode, -35 dB at lower frequencies

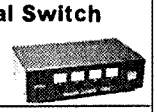
TEN-TEC Orion II



TFT color display, CCFL backlighting. New 32-bit control Freescale DragonBall Super VZ chip.processor RS 232 remote Faster (stock) sweep with finer resolution, enhanced DSP Digital mode operation

LDG DTS-4 Desktop Coaxial Switch

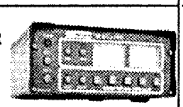
No more under-desk acrobatics to connect up antennas. LDG DTS-4 Desktop Coaxial Switch switch between 4 antennas with the press of a button.



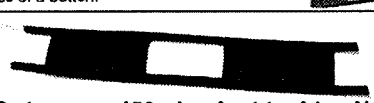
Model 516 Argonaut V IF-DSP QRP Transceiver

IF-DSP, modem 20 watt HF transceiver. 20 watts output power, all modes. SSB, CW, digital modes, and FM. Front panel adjust 1-20 watts output. AM operation at 5 watts carrier power (20 watts PEP).

MAC-200 MASTER ANTENNA CONTROLLER (Smartuner Built-In) Control up to 5 Antennas



Right antenna: right band: right time. The Master Antenna Controller is your base station control center, no switching and tuning. Select from five antennas— automatically get minimum SWR. You control your antennas.



Order your 450 ohm Ladder Line NOW

We have SGC

SGC 237 Waterproof Auto Tuners

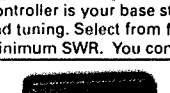
SGC 239 Economy Auto Tuners

Autek Antenna Analysers

Autek RF 2kW in-line Power meters

Lutron Lutron Measuring Instruments

Vantage Pro Weather Stations

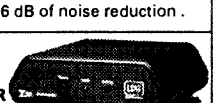


ADSP SPEAKER

SGC

Up to 26 dB of noise reduction .

LDG ELECTRONICS z100 TUNER ANDZ1000 HIGH POWER AUTO TUNER



SG-237Smartuner™

High density surface mount components in a 4 layer PCB on chassis: high efficiency, reliability, performance, excellent electrical and RF ground system. Weather resistant,

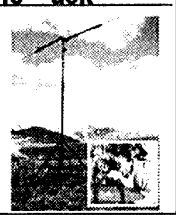
MULTIPLE APPLICATIONS -- base, mobile, portable, marine or aviation. Rugged, small, max. flexibility. 100W power, coverage to 60MHz, matches most HF transceivers. Use balanced or unbalanced antenna: whips, backstays, dipoles, loops and longwires, only 28 feet of antenna for full coverage operation.

Full info available—ask

TEN-TEC KITS

Ten-Tec Acro-Bat antenna hanger.
UV resistant, S/S hardware. Hang ladder line-fed or small gauge RG-58 or RG8X coax-fed wire antenna.

BUDDIPOLE



Dipole — vertical... Fits in travel bag! Optimised for transmit power, proven for DX work. Ultra light materials, High-Q coils. Zero-loss balun with Quick-Connect feedpoint.
Standard Comes with carry bag

News from...

VK2

Tim VK2ZTM.

Seasons Greetings from the Council and volunteers of Amateur Radio New South Wales. As year's end approaches, the Parramatta office will close mid month and reopen about mid January. The final VK2WI morning and evening news session for the year will be on Sunday the 18th. During the holiday break there will be a morning only session until a date in January, yet to be determined. For 2006, the VK2WI team requires more volunteers for both sessions. The roster is a bit light on at the moment, resulting in some of the team having to attend many times in the quarter. Each session requires two or more persons on site. Not everyone in attendance requires to be licensed and it is an opportunity for those with reading interests to be the announcer. Anyone interested should contact the roster coordinator, John VK2JJV or the Parramatta office by phone or e-mail. Telephone 02 9689 2417 or vk2wi@ozemail.com.au

AR-NSW provided Amateur Radio House as the venue for the Sydney accreditation training and on the first weekend this month conducted their first training and assessment course. Terry VK2UX, AR-NSW Education Officer is looking for volunteers to assist with future weekends. Courses will be conducted at intervals determined by the demand. Previously, AR-NSW conducted exams every six weeks. The coordinator of those exams, Pat VK2JPA has retired from the position after many years of dedication to their operation. Council extends their thanks to Pat for her efforts with this service to the hobby.

AR-NSW has offered use of Amateur Radio House to clubs and groups who do not have suitable locations to conduct their assessment weekends. The library area has chairs and desks as well as the VK2AWI station for the practical.

AR-NSW introduced a tender system for the disposal of surplus equipment. The first cycle closed mid November and those successful were able to collect at the Trash and Treasure which was scheduled to be conducted at VK2WI Dural, at the end of the month. The tender details are to be found on the web domain www.arnsw.org.au

A conference of VK1 and VK2 clubs was jointly sponsored by the WIA and AR-NSW at Parramatta last month. Most clubs wind up their activities for the year this month and many take a break until February. To keep all informed, it is asked that clubs and groups provide VK2WI News - before 18th December - with their schedule for the first couple of months of 2006. One exception is the Coffs Harbour club who often hold a field day around the second Sunday in January.

VK3

Barry Robinson VK3JBR

Website: www.amateurradio.com.au Email: arv@amateurradio.com.au

Seasons Greetings

What a year it has been, with plenty of activity involving Amateur Radio Victoria. This will appear in the annual reports presented at the Annual General Meeting to be held in May, 2006.

One activity was the successful special event station AX3ITU celebrating 140 years of the International Telecommunications Union. For the first time Amateur Radio Victoria took part in the International Lightship and Lighthouse Weekend from the Williamstown Lighthouse and Timeball Tower.

Final plans are being made for the Members' Think-Tank, to look at the future direction of this organisation. Ideas had been raised in relation to member activity and hopefully these can be brought to reality.

Also the first of the Foundation Licence training courses and assessment sessions have been held in Victoria, following on the earlier successful session on the Gold Coast.

Every active radio amateur has a role to play in providing an inviting atmosphere on the amateur bands and where appropriate a bit of friendly guidance.

On behalf of Amateur Radio Victoria Council, I wish you all compliments of the season and a Happy New Year.

End of year and election

Our Ashburton Office closes on Tuesday 20 December and it reopens Tuesday 7 February. During the break urgent matters will be given priority. Office-bearers will also be engaged reconciliation of bank accounts, other financial statements, stocktaking and an annual audit.

Nominations for the 2006-2009 Council can be made on a form available from the Secretary. The deadline is 2.30pm on Thursday 23 February, 2006. Notices of Motion, for the AGM to be held on Wednesday 24 May, close on the same day.

A replacement Company Secretary is required from the membership to fill the position becoming vacant with the retirement of John Brown VK3JJB. Anyone interested to learn more should contact the President, Jim Linton VK3PC.

Missing e-membership services?

If you are a member of Amateur Radio Victoria but have not supplied your email address, then please do so to help us keep you better informed about our organisation.

Send your email details to arv@amateurradio.com.au or visit our website to register online for access to the Members Website.

VK5

Christine Taylor VK5CTY

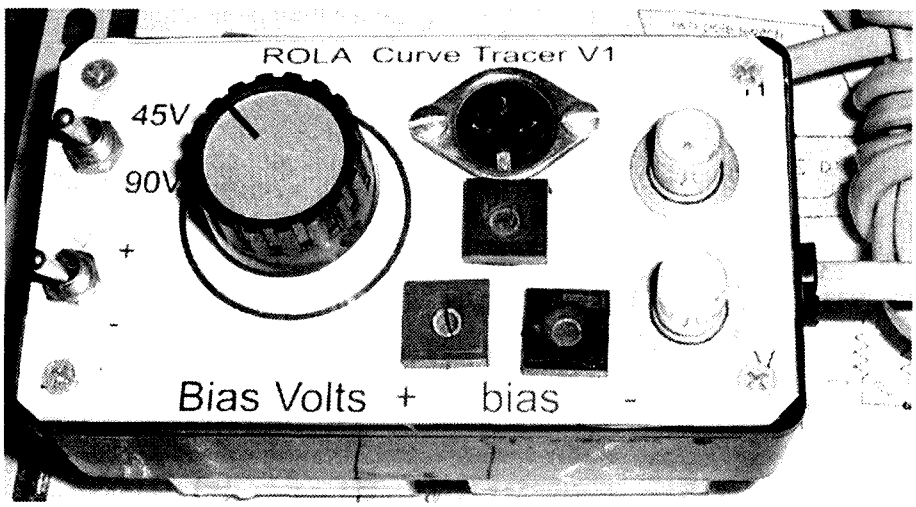
Adelaide Hills Amateur Radio Society

The last meeting was a Show and Tell. The variety of items and the talks were very interesting and gave the members some new ideas for their own projects, I'm sure. The lecturers were kept busy answering questions all through the tea break.

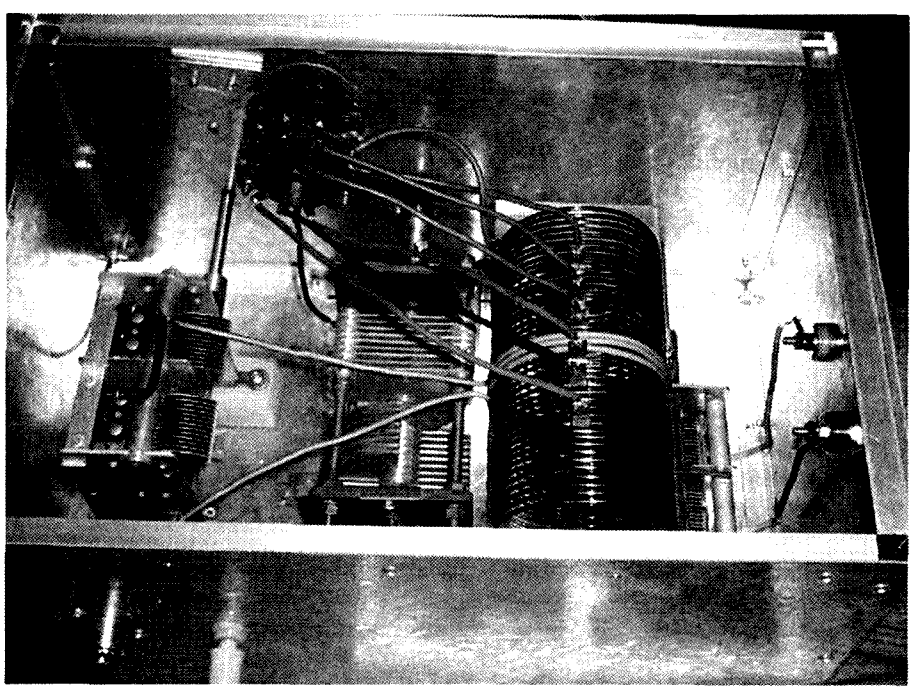
Some photos illustrate some of what we saw.

By the time you read this AHARS will

continued next page



A curve tracer made by Graham VK5ZFZ.



Another antenna tuner made by Horst VK5ZLW. He not only made the antenna tuner, he made the tuning capacitor from aluminium sheets and copper rod!

Royal Cook Island Amateur Radio Club

Kia Orana! (Greetings!)

For those amateur radio operators and their families visiting the Cook Islands in the holiday season, December 05 and January 06,please make a note of the following:

To obtain a local ZK1 Cook Island Amateur Radio licence,either in advance or on arrival in Rarotonga, Cook Islands please have a copy of your original Australian VK licence together with a NZ $20.00 licence fee:

Contact: Mr. Papeiha AVIU
Telecom Cook Islands
PO BOX 106, Avarua, Rarotonga, Cook Islands. South Pacific.
Phone: (682)29682 Fax: (682)26174
Email: papehia@telecom.co.ck

Amateurs active in Rarotonga are Jim ZK1JD, Victor ZK1CG , John ZK1AX. Most check into the afternoon ANZA net or Inter Island Nets on HF (High Frequency).

Active on Aitutaki is Des ZK1DD and James ZK1DG.

Des Clarke ZK1DD and his wife Queen Manarangi have the Club equipment & antennas on Aitutaki at Gina's Lodges.

Des has access to the family owned Akaiami Island in the Aitutaki Lagoon, where one can be alone on the island to use one's radio. A real Robinson Crusoe experience!

Go to www.cookpages.com/GinasLodges-Aitutaki/ to learn more.

Or contact Des ZK1DD directly on Phone/Fax: (682) 31-058

Or email : queen@aitutaki.net.ck

I welcome in advance those amateurs and their families holidaying in the Cook Islands.

Enjoy and have a safe trip.

Kia Manuia! (Farewell!)

James Goodger ZK1DG
Email: pukapan@yahoo.com

News from...

VK5

AHARS *continued*

have had their Buy and Sell. Whether it was only a matter of 'your junk is now my junk' or something new for the shack, you can be sure everyone met some old friends or made some new ones.

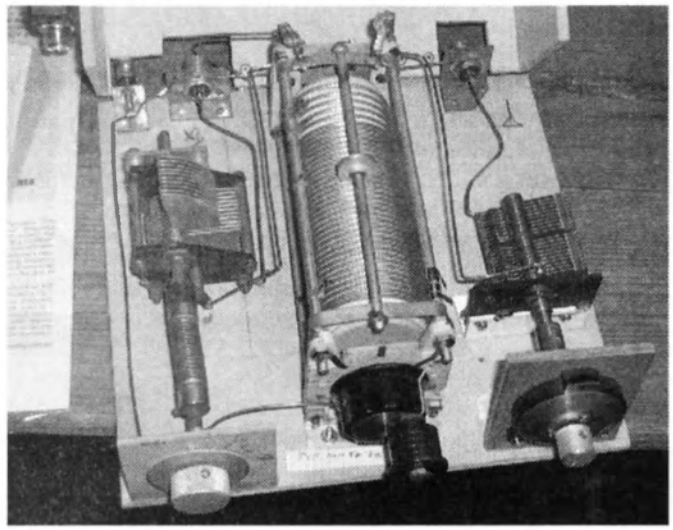
The AHARS Buy and Sell is the one day of the year when VK5 amateurs meet and greet as much as buy. A great day is had by all.

The next official meeting of AHARS will be on Thursday 16th February 2006. If you are in Adelaide on any third Thursday of the month, please contact Jim VK5NB or Leith VK5QH for information. Everyone is welcome.

AHARS has a collection of video tapes (or DVD) of lectures given to the club. If you would be interested to borrow a copy, please contact Jim or Leith to arrange this.

Congratulations to the Gold Coast Radio Club for being so prompt with their first Foundation License Course. AHARS will run a similar course some time in the new year.

Best wishes to amateurs everywhere for the Festive Season from the committee of AHARS. See you in the February issue.



An antenna tuner built in a wooden box, made by a new amateur Lyle (I'll have to check on his callsign. He may not even be in the new callbook - will phone you)

Old Timers' Luncheon in VK5

Unfortunately this year's luncheon was not very well attended although there were some welcome new faces. The members held a minute's silence for the SKs during the past year, including the President who had been ill for a number of years, but enjoyed still being able to act as President.

The meal was up to the usual standard and so was the display provided by Vaughan Harvey from his historical collection.

Vaughan brought along a National HRO, wartime receiver that had pleasant memories for many who had used these during their years in the services.

Unfortunately, Vaughan had to confess that although he had restored the set to look as it once had done, he had not been brave enough to power it up for fear of destroying it.

The National HRO reciever on display at the Old Timers' luncheon.

Jamboree on the Air – Oct 15th 2005

The Kidman Park Scout Hall was all set up to greet the outside world. They had gone to a lot of trouble with posters, radio equipment, plenty of networked computers set up in different rooms for different functions.

A pump up mast was borrowed and raised to about 50 ft (16 m) supported with many guy wires, supporting a multi band dipole and a "long wire". When the HF propagation was not good they used Internet chat to contact many countries. VK6 was contacted on HF.

The UK, America and Canada were contacted using IRLP, also a scout group at "Yundi" SA on VHF. Scout leaders also talked to each other when the attending Scouts "were stuck for some thing to say" or were allured away to different activities.

One scout leader had just finished working for his Duke of Edinburgh Award, and one young girl was going for her Baden Powell Award.

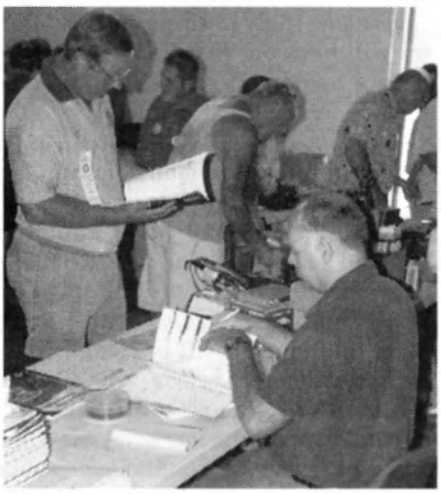
33 Jenny

VK4

Gold Coast Amateur Radio Society

Laurie VK4VCC

These pictures were taken at the Gold Coast Amateur Radio Society Inc Radio and Ellectronics Fair held recently. It was well attended and the Foundation Licence table did great business.



Above: The crowd gathers for the Lucky Door Prize.

Left: Ron Bertrand VK2DQ, Manager of the Radio & Electronics School promoting the Foundation Licence.

VK7

Justin Giles-Clark, VK7TW
Email: vk7tw@wia.org.au Regional Web Site: reast.asn.au

2005 Sewing Circle BBQ

Hearty congratulations to Ken VK7DY and Wendy for again organising and hosting the Sewing Circle Barbeque at his QTH at Orielton, 30 km east of Hobart. 71 people enjoyed the day, 39 of them amateurs with many young people attending. There was representation from all over Tasmania.

The homebrew first prize went to Trevor, VK7TS for his Linear Amplifier. The Sewing Machine Award was announced and went to Elwyn VK7EH in absentia recognising his commitment over many years to the Sewing Circle Net. The VK7HTW (Silent Key) 2005 Encouragement Award went to Damien, VK7HDS in recognition of the work he has done to promote amateur radio to the CB fraternity. Thanks to Max, VK7KY and Wendy for providing the valuable raffle prizes.

Great company, very pleasant surroundings and fantastic weather made for a wonderful day.

Sewing Circle BBQ attendees checking out the buy and sell tables!

JOTA in VK7

The JOTA weekend saw a flurry of activity across VK7 with groups in the North West, North and South.

In the North the following amateurs were involved: Phil VK7JJ, Dion VK7YBI, Greg VK7YAD, Jason VK7ZJA, Colin VK7ZCF, Karl VK7HDX, Rick VK7HBR, Kevin VK7ZPE, Roy VK7ROY, Tony VK7NAU, Wayne VK7XGW, Allan VK7AN, Tony VK7YBG and catering by Anne Eagling.

In the South the following amateurs were involved across five different groups: Rod, VK7TRF, Paul VK7PA, Graham VK7ZGK, Ken VK7DY, Roger VK7XRN, Gary VK7JGD, Peter VK7TPE, Damien VK7HDS, Danny, VK7HDM, Ray VK7VKV, Chris, Aaron, Reg VK7KK and Brian VK7HSB.

Thanks go to all volunteers who attended the various sites around the state and those amateurs who attended outstations and made contact. This is a great opportunity to show young people what fun amateur radio can be and get them interested in the hobby. You have all done VK7 proud!

BPL Interference Watch

The BPL vigil continues with rollout activity in Mt Nelson and Tolmans Hill and infrastructure appearing in Newtown and Lenah Valley. I encourage all amateurs and HF CB operators to head up to Mt Nelson and take a listen to what BPL sounds like. Keep writing those letters to the newspapers, politicians and the ACMA. We need to keep the pressure on.

North West Tasmania Amateur Radio Interest Group

IRLP nodes appear to be breeding in the NW, with three now available. All these Nodes are sponsored by NWTARIG through the facilities of VK7AX. Node 6700 linked to VK7RAA serves the North & N/East. Node 6124 (Echolink node 100478) linked to VK7RNW serves the Central Coast and Node 6616 (Echolink node 152375) linked to VK7RMD serves the NW Coast.

Northern Tasmanian Amateur Radio Club

In November we were treated to two meetings. The first on the 2nd saw a very interesting talk from Mr David Hamilton, Senior Officer of Forest Education. Mr Hamilton's talk was on both sides of the forestry debate. On the 9th, Michael Owen, VK3KI, President WIA gave us a talk on the National WIA. We had about 25 people attend at the QTH of David, VK7HAH, a great night.

Radio and Electronics Association of Southern Tasmania Inc.

The big news in the South was our first Foundation Licence course on the 19-20 November, full a few days after advertising it! By the time you read this we will have our first VK7 foundation licence holders. If you wish to reserve a place for the next available session please contact Reg, VK7KK on 03 6248 6824 or regemm@ozemail.com.au.

R5 the Snug Tiers repeater is now on air TX: 146.850 MHz and RX: 146.250 MHz. Callsign VK7RHT. By late November, thanks to the Tasmanian Small Craft Marine Radio Group, R5 and R2 at the Domain will be linked. This will provide much greater coverage for Southern VK7. Thanks to all involved.

Our November meeting on the 10th was a BBQ and talk by Michael Owen, VK3KI on the formation of the National WIA. We had about 22 people attend and many interesting questions were asked. Michael was treated to a BPL tour before continuing his Tasmanian holiday.

ar

Michael, VK3KI addressing REAST members

VK3KI deep in conversation with Rod, VK7TRF, Reg, VK7KK, Eric, VK7TAS and Dietmar.

Christine Taylor VK5CTY

Congratulations Amanda Gray!

Congratulations! ALARA is thrilled that the very first foundation licence holder is a YL. With the callsign VK4FRST everyone will know just who they are talking to when they hear Amanda on air.

I rather hope Amanda will join ALARA, the Australian Ladies Amateur Radio Association. We will have to make sure that the VK4 Rep sends Amanda an application form.

The ALARA Contest results are elsewhere in this magazine but our congratulations go to Rosanne VK4NAW for her sterling effort in amassing 528 points. Even with the triple points for contacts with early members, that is a mighty score.

Some of the comments added to the log sheets can be repeated here. Such as "It must be the most leisurely contest in the calendar", or "Thanks for a great, friendly Contest" – comments made by OMs illustrate just the feeling we want for our Contest. Conditions were good though there were not as many DX contacts as there have been in some years, but those of us there had a great time.

Amanda VK4FRST, flanked by encouraging onlookers, operates on 2 m

JOTA participation

I have no photos, but I know that a number of VK5 and at least one VK3 ALARA member participated in JOTA this year. I am sure there were others. Maybe next year you will tell me – and even send me pictures??

Jeanne VK5YQ went up to Woodside to help run the station there for scouts and guides. Jenny went with her OM Kevin VK5AKZ to the Kidman Park Group. This group is led by Brian VK5PBL. For many years Brian has spend JOTA at Yundi helping Rufus, VK5YO with the Black Forest Scouts and other troups who came to Yundi, but this year he stayed with his own troup for the first time. Most of the group attended but there were not many YLs among them. Maybe after Jenny was there this year the girls will have a go next year.

Pat VK3OZ helped out at her local Scout Group in Turadin, on Westernport Bay, and Shirley, VK5JSH participated at the Morphett Vale Scout Hall. At both venues there was some lively interest in the radio experience including IRLP.

Sponsorship is very rewarding

Almost from its inception, ALARA has had DX members through sponsorship. A VK member sponsors a DX YL and usually is sponsored into the overseas DX YL association. We write to each other if we cannot make contact on air. Email has made correspondence almost as instant as on air contacts, recently, but however we 'talk' we make friends and learn about other places.

When there is a reciprocal sponsorship we get magazines from overseas and 'meet' even more friends. If we are lucky enough to travel to our DX friend's country we can meet for an eyeball as I did this year in the UK. If you haven't yet sponsored anyone, I suggest you do so soon. Contact Maria VK5BMT QTHR the callbook. She will be delighted to help you.

Sponsorship in ALARA

For some years now I have sponsored Jasmine G4KFP into ALARA. We have never spoken on air but have kept in touch by e-mail. Jenny MW0BET I have only sponsored for a year or so. I in exchange am sponsored into BYLARA.

Once I knew when I was going to the UK and would be reasonably close to Jasmine and Jenny in Blackpool (as part of a tour of the Lake District), I sent each of them a postcard with dates. To my delight they both wanted to see me as much as I wanted to see them.

In the event Jasmine and her OM Billy came to Blackpool and took us for a tour of parts of Lancashire we had not seen, including Morcombe Bay. Eric Morcombe of Morcombe and Wise took his stage name from the bay. The conversation never waned. We had a lovely day together, one we will remember for years to come.

On another day Jenny met us at the Warrington railway station and took us to see the Anderton Boatlift, just over the border in Cheshire. Again a great day. We

Jenny MN0BET and Christine VK5CTY

continued next page

Spotlight on SWLing

Robin L. Harwood VK7RH

The year that is rapidly drawing to a close has been an eventful one. Just recently, momentous decisions were announced about the future of the BBC World Service.

On the 25th of October, Nigel Chapman, Director of the BBC World Service, announced the biggest transformation of the BBC World Service since the end of WW II indeed of the most far-reaching since the BBC began international broadcasting more than 70 years ago. Ten language services will be slashed in March next year, and an Arabic TV service added, changing the emphasis of BBC World Service English programming.. Mr. Chapman put the target audience into these in three categories:

"The first are opinion-formers and decision-makers -we will target them in every market.

Secondly, people needing basic news and information -as targets in developing markets.

And, thirdly, audiences for lifeline services in areas of profound conflict and failed states."

The need to utilise other technologies and platforms will also be accelerated as the BBC bureaucracy considers that shortwave usage is declining. With this in mind several language services will be closed, including Bulgarian, Croatian, Czech, Greek, Hungarian, Polish, Slovak and Slovenian. Two Asian languages, Kazak and Thai will also go because of their relatively low market impact. However the Thais are not happy with this decision and protested.

The closure of the eight European language services ends a chapter in history, because it built up a loyal audience during and after WW II and into the Cold War period. A viable independent media has emerged since the demise of the Iron Curtain and the BBC's audience also has shrunk. English language programming will however continue to these regions.

The focus of English programming on the BBC World Service will be on news and current affairs and away from other forms such as music, drama and sports. It sounds similar to the fare we get presently on "BBC World" on the PAY-TV platforms here in Australia. The BBC news and current affairs staff will be downsized and some 236 posts will close across BBC World. At the same time, around 200 new posts will be created, presumably in the new BBC Arabic TV service.

Sadly it is no longer the BBC World Service we grew up with. True one can connect to the various BBC domestic networks online but this is no substitute for listening on your radio. It is now possible to even get the BBC via your mobile phone but this is far from free.

In the October column, I said that the amount of DRM transmissions will be increasing during this period.

John L Cartmill, VK4BJ, has informed me that this month Deutsche Welle will increase DRM output. Presumably this includes 9680 from 0600 which has caused comments that the DRM mode is taking up too much bandwidth. It would be a better idea for DRM to be on channels away from the normal DSB mode. John is getting good reception of the BBC on 9470 in DRM.

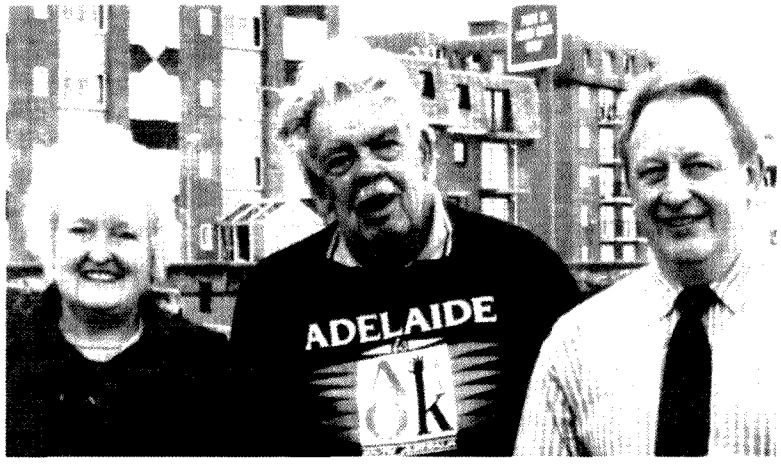
In late October, I received my copy of the 2006 edition of the Passport to World Band Radio. It is 592 pages yet there seems to be over 20 or pages of ads for Eton Radios, the successor to Grundig.

China and Tibet are the focus of this year's edition. It has reviews of various SW receivers to suit all budgets but seems to be a rehash of reviews from previous editions. The blue pages are there again with listings of who and what is there. However it would help if they would indicate DRM services. PWBR 2006 was a little disappointing and is the same format it has used for some time. Perhaps it is a reflection of the decline of Short Wave activities.

Well that is all for this month. May I wish the Season's Greetings to you and yours and look forward to 2006.

ar

ALARA *continued*



Jasmine G4KFP, Geoff VK5TY and Jasmine's OM, Billy

all found the boatlift interesting and enjoyed a ride on a canal boat, down the lift and for a short trip along the Weaver River. Once more we found plenty to talk about and were sorry when the day ended.

We would have never met these nice people without the ALARA sponsorship system. What is more, other travellers have also been able to enjoy similar experiences.

If you would like to be part of the ARARA sponsorship scheme then please contact Maria VK5MT QTHR in the callbook.

Best Wishes + DX Before Dishes

From all in ALARA to all other amateurs.--- Have a great Christmas and celebrate the New Year safely but enjoyably. May there be much DX before dishes in your lives.

ar

Bill Magnusson VK3JT

SSETI launch successful but short-lived

The SSETI Express satellite was successfully launched at 06:52 UTC on Thursday, 27 October 2005 on board a Kosmos 3M launcher. One hundred and three minutes later, exactly on schedule, the first signals were heard at the ground station in Aalborg, and two-way communication was established. Some problems began to surface during the deployment of the "cube-sats" and these have resulted, at the time of writing, in the SSETI operations being put into standby mode. The SSETI Project Manager, Neil Melville posted this very detailed message on 1 Nov and it's worthwhile listing the main points here. Everyone remains hopeful that the SSETI will be recovered so that the other amateur radio experiments can be given a run.

Here is Neil's report:

The SSETI Express student microsatellite mission has been a remarkable success, achieving its two first mission objectives and a number of important milestones. Due to a failure in the electrical power system on board, the spacecraft is inoperable and mission control is on "standby". There is a small but significant possibility of recovery, the likelihood of which is being ascertained by ongoing testing. The educational goals of the project continue to be met by the student teams who are still working hard to analyse and understand all available data, such that the lessons learned can be applied to future missions.

1. Objective 1 is fulfilled: Reaching the launch pad after progressing through the challenging and rigorous acceptance process is a major milestone demonstrating the capability and applicability of the SSETI Program itself and all of the student teams involved.
2. Objective 2 is fulfilled: All evidence suggests that the three Cubesat passengers were successfully deployed into orbit by SSETI Express and were hence able to begin their own independent missions. The Cubesats Xi-V and UWE-1 are alive and well, the status of NCube-2 has yet to be confirmed.
3. SSETI Express booted up in orbit and transmitted its first data back to earth precisely on schedule. This data was received and decoded by the primary ground station and several others. This confirmed that SSETI Express survived its journey into space and was successfully separated from the launcher.
4. The primary ground station established reliable two-way communication with SSETI Express. This was a remarkable achievement further demonstrating the capability of the SSETI Program and all the students involved.
5. A significant amount of housekeeping data was downloaded from the spacecraft, allowing for a detailed analysis of the situation on board. This also involved the global network of radio amateurs, who have given us invaluable support and additional data during this mission.

The problem:

6) In order to ensure the safety of the other spacecraft on the same launch vehicle, SSETI Express remained inactive and coasted for 65 minutes before deploying the three Cubesat passengers.

7) During this time all the energy gathered by the solar panels was to be dissipated within the spacecraft. Evidence strongly suggests that this dissipation system failed by fusing on, therefore not allowing any energy to charge the spacecraft batteries.

8) The battery charge steadily declined during the mission, causing the spacecraft to enter safe mode after approximately 6.5 hours, and eventually shutting it down altogether.

The AMSAT group in Australia

The National Co-ordinator of AMSAT-VK is Graham Ratcliff VK5AGR. No formal application is necessary for membership and no membership fees apply. Graham maintains an e-mail mailing list for breaking news and such things as software releases. Contact Graham if you wish to be placed on the mailing list.

AMSAT-Australia Echolink Net

The net meets formally on the second Sunday of each month. Anyone with an interest in Amateur Radio Satellites is welcome to join in and take part. Graham VK5AGR acts as net controller. The net starts at 0600UTC and you can join in by connecting to the AMSAT conference server.

All communication regarding AMSAT-Australia matters can be addressed to:

AMSAT-VK,
9 Homer Rd,
Clarence Park, SA. 5034

Graham's e-mail address is:
vk5agr@amsat.org

The outlook:

9) Careful analysis of the data received, coupled with ground-based computer simulations and hardware tests, strongly support the proposed theory of a specific component failure in the excess power dissipation system.

10) Ground-based hardware tests confirm the possibility of a further failure mode of the specific component, which would allow the batteries to charge and the spacecraft to operate once again.

11) Testing is ongoing to ascertain the specific likelihood of (10), and to investigate other possible alternative explanations.

12) Given that the spacecraft is currently inoperable, the mission cannot continue as planned. It is therefore on indefinite "standby", pending the technical possibility of re-activation of the spacecraft, as in (10).

13) The team remain hopeful and vigilant. The primary ground station and mission control centre are

being configured for autonomous monitoring of the spacecraft, such that if it reactivates the team will be immediately alerted and ready to resume the mission.

14) The educational goals of the mission continue to be met daily as we try to analyse and understand the events since the launch.

So there you have the situation as this column goes off to the Editor. Amateur radio satellite operators are continuing to monitor the downlink frequency and of course everyone is hoping for the best possible news for Christmas. As the statement above makes clear, ESA and the SSETI Association greatly value the input that amateur radio operators are providing and are asking amateurs around the world to continue to check for signals on 437.250 MHz at the appropriate pass times. These signals may be short bursts of 9k6 data every 18 secs or bursts of pulse telemetry every 30 secs. Anyone hearing anything that matches the above detail is requested to please e-mail details to <missioncontrol@sseti.org> .

SuitSat due for launch in early December

At the time of writing there are tentative plans for SuitSat to be hand-launched during a Space Walk (EVA) taking place from ISS sometime around December 8, 2005. These arrangements are subject to last minute changes of course but with luck SuitSat could be in orbit as you read this column. Keep monitoring the ARRL and AMSAT web pages for updates, and of course, the ARISS news services. To refresh your memory, the SuitSat project is a free-floating satellite that will be running on batteries only. The life span of the project will be limited to the lifespan of the batteries. SuitSat may last as little as a week or as long as 6 weeks. It will take the form of a transmitter and computer built into an obsolete space suit which was due to be jettisoned from ISS and be burned up in the atmosphere. The full story of SuitSat is available from the ARRL web site.

SSTV details:

The SuitSat project will transmit 2 m FM on 145.990 MHz. The transmission sequence will repeat every 9 minutes. Each cycle will consist of telemetry, pre-recorded voice messages and a pre-programmed SSTV image. The SSTV mode will be Robot-36. The SuitSat project is downlink only. There are no up-link channels. Doppler shift on the 2 m FM signal should not be a problem and it should be possible to copy the transmissions on very simple gear. A hand-held TRX should do nicely for the voice messages. To receive the SSTV pictures you will need to connect the audio from your radio to your computer sound card and run some SSTV software. I'll certainly be out in the yard with my laptop computer and IC-2a. I use "MMSSTV", which is available as a free download from the "mmhamsoft" website but there are many more around, some with advanced features like multiple screen operation and a wide range of operating modes. MMSSTV is a nice easy way to get going if you haven't dabbled in SSTV before and simply want to monitor SuitSat. This promises to be an interesting project so do try to listen in and maybe capture a slow-scan TV picture from space. The Keplerian elements for ISS should be close enough immediately after deployment and SuitSat battery life will dictate the need for updating after a week or so. SuitSat is the brainchild of Sergei Samburov RV3DR. It is aimed at amateur radio satellite users and school students but just about anyone who owns a VHF scanner radio can listen on 145.990 MHz so the audience will be wide. It should be worthwhile setting up your satellite station for SSTV because the new SSTV equipment is now on board ISS and will be set up soon. It will run higher power than SuitSat and will have the capability of transmitting a continuous string of freshly taken SSTV images from the ISS. This feature is long awaited and will continue a tradition started on MIR many years ago of transmitting virtually real time photographs from space via amateur radio.

From ham-radio to Galileo, the SSTL story

The first of the Galileo satellite fleet, ESA and Europe's answer to GPS is due for launch this month. The first pilot spacecraft dubbed GSTB-V2A has been built by Surrey Satellite Technology Ltd. (SSTL) in the UK, a company that was created in 1980. Many satellite old timers will remember UoSats-9 and 11 and their higher speed digital successors UO-22, KO-23 and KO-25. All these satellites had their roots in the organisation that was to become SSTL. At the time of writing, the ESA website News section has an interesting retrospective including an interview with Dr Martin Sweeting G3YJO in which he recounts the humble origins of SSTL back in the 1980s and looks to the future. The ESA web site contains much of interest to amateur radio satellite enthusiasts.

Yet another potential threat from emerging technology

One is never too sure these days whether computers are our best friends or our worst enemies. Ham radio has just been through a threatening time with the spectre of OTHR, a technology heavily dependent on computer technology. Then there was the equally dire threat of BPL with its potential to wipe out everything from 1 MHz to 80 MHz. While neither of these threats has been completely alleviated, it seems that they may not have the devastating consequences we feared. BPL may be doomed to commercial failure and OTHR seems confined to infrequent excursions into only the lower HF bands. Neither seem to pose any threat to satellite operations. However, just when you thought it was safe to go back into the water – another potential threat emerges. The European Radiocommunications Organisation (ERO) are seeking public consultation on the implementation of Ultra Wide Band (UWB) in the British Isles and Europe. UWB is a wireless version of USB designed to handle high definition video in personal computers

Beyond our shores

David A. Pilley VK2AYD
Vk2ayd@wia.org.au

U.K.

Communications Crazes:

Morse ringtones for your cell

CW by telephone is the latest craze sweeping ham radio. Well kind of.

Ever wish that your cellular phone sounded more like your ham radio station? Well now it can thanks to ringtone programmer and Morse fanatic Andy B M1RGZ.

According to the GB2RS News Service Andy has developed a free-to-use online computer programme to generate personalised Morse code ring-tones for mobile phones.

Ring-tones have become all the rage recently. This, thanks to the multimedia capabilities of the latest generation of cell phones. But there was no simple way of creating Morse ring-tones.

Now, Andy's website - morsetones.no-ip.org - makes it easy. You simply enter a message, choose the ringtone's speed and pitch and press a button. A MIDI file will then be generated that you can copy to your mobile phone. Want to try it? Its as easy as clicking.

(RadCom)

Safety alert:

HP recalls laptop battery packs

If you own a laptop computer manufactured by Hewlett-Packard, listen up. The company has announced that it is recalling around 1,350,000 battery packs for certain HP and Compaq brand laptop computers. This, after receiving reports of overheating and melting.

According to reports, Hewlett-Packard's recall affects HP Pavilion, HP Compaq, Compaq Presario and Compaq Evo laptop computers that use lithium ion re-chargeable battery packs. The recalled batteries carry a barcode label, starting with GC, IA, L0 or L1 and were sold internationally with new laptops between March 2004 and May 2005.

The company reportedly is in receipt of 16 reports of batteries overheating, four cases out of which have occurred in United States. H-P has advised consumers to stop using the products, and contact the company for a free replacement.

More is on-line at www.hp.com/support/BatteryReplacement (TechTree, PC World, others)

(ARNewsline)

U.S.A.

Video News Corp

Amateur Radio Newsline had an interesting idea.

It has been quoted that over 1,000 Radio Amateurs assisted in the hurricane disasters of both "Katrina" and "Rita" that hit the south coast of the USA. There has been a lot of media hype on the problems with communications, but no one seems to have videos of amateurs in action. A similar situation has occurred with Hurricane "Wilma". Perhaps we are the efficient silent service, or is a picture of someone talking into a hand-held walkie-talkie just not worth shooting? Alan Kaul, W6RCL, has suggested a Ham Radio Video Corp. It's a thought. However, if you have a video camera, why not take pics and pass them on to your local TV station.

World beacons

During the RTTY contest in October I was amazed at the number of RTTY stations that sat on 14.100 MHz calling CQ, etc. To me this frequency is sacrosanct. I listen here often to find out just how good propagation is from my QTH. Perhaps these keyboard operators are not aware of this excellent world wide service. Whatever, with all the free band space available, I believe contests should be confined to a defined frequency band and any one operating outside should be penalized. Pile-ups in restricted frequencies would certainly expand their skills.

For newcomers to amateur radio 14.100 MHz is one of the frequencies used by the IARU with a continuous stream of some 18 call signs from various countries around the world. Each station transmits for 10 seconds with four different output powers ranging from 100 watts to 0.1 watt. By listening to these stations you can determine propagation from your QTH. There is one down side – it is in Morse code – but then if you are a DX hunter you will know the code. Check out information in the WIA Callbook.

(VK2AYD soapbox)

ar

WANTED URGENTLY

Articles for Amateur Radio

Technical, club activities, DXpeditions, Field Days, opinion, or whatever your experience is or has been in amateur radio

Address for submitting articles can be found on page 1

AMSAT *continued*

and television sets and if anything could be described as ubiquitous today it's USB. The technology was first proposed using frequencies in the range 3.1 – 10 GHz which could have consequences for the 5 and 6.5 GHz bands, just as the movers and shakers of our amateur radio satellite community are looking to these bands for inclusion in the next generation of amateur radio satellites. AMSAT-UK, the UK Microwave Group and BATC have put in vigorous objections and have gained a little ground in that the latest proposals mention only the frequency spectrum from 6-9 GHz for long term development of this new technology. If (when) this technology gets a foothold in Europe or anywhere else it may become a fait accompli. Before we even get to hear about it our computer and electronics stores, already awash with gizmos capable of wiping out the 2.4 GHz band, could be full of 5 and 6.5 GHz noise making devices. Let's all hope that the intense lobbying from high profile amateur radio organisations across the world can help restrict this threat to non-amateur radio frequencies.

ar

DX news & views

VK4OQ,
P.O. Box 7665,
Toowoomba Mail Centre, QLD 4352.
Email: john.bazley@bigpond.com

As the year draws to a close we certainly have seen activity from some really rare spots during 2005 so I wonder what 2006 has in store, apart from the next major DXpedition – Peter 1 - 3Y0X due to take place in early 2006 – an operation that many of us have been waiting for. I can do no better than draw your attention to the last Press Release.

From: Ralph, K0IR and Bob, K4UEE, Peter I DXpedition co-leaders.

The 2006 Peter I (3Y0X) DXpedition Team announced that it has been awarded a major sponsorship grant by the Northern California DX Foundation, Inc. (NCDXF).

This DXpedition is funded principally by the contributions of its twenty-plus team members, but 30 % of the total cost must come from the DX community. We are extremely pleased that the Northern California DX Foundation has decided to be the DXpedition's largest financial contributor. Their contribution to the 2006 DXpedition exceeds their contribution for last year's postponed effort. The DXpedition leaders and team members thank NCDXF for their continued confidence and support.

In early February, 2006, a multinational team of approximately twenty operators, one explorer, and a professional photographer led by Antarctic DXpedition veterans Ralph Fedor, K0IR and Bob Allphin, K4UEE, will activate Peter I Island. Team members come from France, Norway, Russia, Switzerland, Netherlands, Martinique and the United States, and many possess significant DXpedition and Antarctic experience.

For further information on the Peter I DXpedition, and how to contribute to the success of this DXpedition, go to www.peterone.com.

W7KFI, Susan Meckley, set sail from California aboard the USSV Dharma in late 2001. She is on her way to Phuket, Thailand over the next few years and plans to take multiple stops along the way. Earlier this year she was in Mexico. Shortly afterwards she headed for the Hawaiian Islands. This September she operated from KH6BB during the 60th anniversary of the signing of the WWII surrender documents by the Japanese, on board the USS Missouri. Soon she will be back on her 32 foot Challenger sailboat and heading to Johnston Island (KH3), which she says has been uninhabited. Plans are to go ashore and operate until she uses up half of her water. Afterwards she will be heading towards the Marshall Islands. If Susan manages to operate from Johnson Island there will be no doubt that she will be in great demand – particularly from Europe.

Members of the Russian Robinson Club (RRC) plan to operate from two IOTA groups in the Seychelles. Exact dates have not been announced, however they did say they would operate from Aldabra (AF-025) and Farquhar (AF-035) Islands for three days each. Team members will include RA3NAN (S79NAN), Sergey; RZ3EC (S79EC), Eugene; and RZ3EM (S79RRC), Andy. They will be using a IC-746PRO, IC-706MKIIG and FT857 along with a TL-922A and Robinzon RR-33 vertical and dipoles. The team does have a Web site at http://www.qso.ru/s79rrc/eng/news.php. QSL S79RRC via RZ3EC, Eugene Shelkanovtcev, P.O. Box 70, Orel, 302028, RUSSIA. QSL S79NAN via RA3NAN and S79EC via RZ3EC.

5Z4/UA4WHX, Vladimir Bykov, has been QRV from Nairobi, Kenya. Activity has been on 10-80 metres CW and SSB. Victor has been having rig problems. If he can get his equipment problems taken care of he plans to operate from Lamu Island (AF-040). After his activity from Kenya Vlad plans visits to Uganda (5X), Tanzania (5H), Rwanda (9X) and Burundi (9U). QSL via UA4WHX.

A T9 Team is heading for Liechtenstein in early 2006. The team will be T93M, T93Y, T94DX (DJ2MX) and T94JJ (OE1EMS). They plan to operate as HB0/T94DX during the CQ 160 metre CW Contest on January 28th and 29th.

5H1CM will be on the air holiday style, not QRV around the clock, with DL7CM, Hans, operating. He will be in Tanzania October 23-December 18, operating on 160-10 m CW, SSB, and RTTY using an IC-706MKGII and 500-watt amplifier. QSL to his home call, DL7CM.

Rich, PA0RRS will be active from Penang Island (AS-015) from 28 December to 8 March 2006. He will operate as 9M2/PA0RRS, but hopefully he will get an official 9M2 callsign. A trip to Langkawi Island (AS-058) may be possible. QSL via home call, direct (Richard Smeets, Schoorveken 100, 5121 NM Rijen, The Netherlands) or via the bureau.

WRTC 2006 REFEREES --- The WRTC 2006 organisers would like to have the referee team completed before the end of the year. Each of the 45 competing teams will have a full-time Referee to monitor implementation of the rules. Referees need to be fully conversant with all the rules and need to stay awake for 24 hours to monitor their team. They also need to have wide contesting-experience on both modes and to be on-site in time for the briefing meetings before the contest. Many applications for this position have already been received, but more would be welcomed, so that the most experienced can be selected for the job. Please send your brief contesting curriculum vitae to these three addresses: py5eg@inepar.com.br, k1zz@arrl.org, g3sxw@compuserve.com

P4/OH1VR (Sep) and P4/OH3SR (Juha), will be active from 28th November until 13th December HF SSB and RTTY. QSL via their home calls

C6AYM (Eric-K9GY) will operate from 23rd December until 1st January 2006 on 40-2 m using CW QRP QSL via his home call.

Special thanks to the authors of *The Daily DX.(W3UR) - 425 DX News (I1JQJ)* and *QTC DX PY2AA* for information appearing in this month's DX News & Views.

ar

Contests

Ian Godsil VK3JS
WIA National Contest Co-ordinator

Contest Calendar December 2005 – February 2006

December	**3**	**RTTY Melee**	**(RTTY)**
	10/11	**ARRL 10 Metres Contest**	**(CW/SSB)**
	17	**OK DX RTTY Contest**	**(RTTY)**
	26 (to 15 Jan 06)	**Ross Hull Memorial VHF Contest**	**(VHF+)**
January	**7/8**	**ARRL RTTY Roundup**	**(RTTY)**
	14/15	**Summer VHF+ Field Day**	**(CW, SSB, FM)**
	28/29	**REF Contest**	**(CW)**
	28/29	**BARTG RTTY Sprint Contest**	**(RTTY)**
	28/29	**UBA DX Contest**	**(SSB)**
February	**4/5**	**Mexico Intl. RTTY Contest**	**(RTTY)**
	11/12	**CQ WW WPX RTTY Contest**	**(RTTY)**
	11	**Asia-Pacific Sprint**	**(CW)**
	11/12	**Dutch PACC Contest**	**(CW/SSB)**
	18/19	**ARRL Intl DX Contest**	**(CW)**
	24/25	**Russian WW PSK Contest**	**(PSK31)**
	25/26	**REF Contest**	**(SSB)**

Greetings to all readers

More with less?

The motto "We Do More With Less" is the slogan of the CW Operators' QRP Club. Many of you will have seen it somewhere and some of you will be members of that Club.

QRP is one of those aspects of Amateur Radio that you either love or sneer at – the argument being "why bust your ears trying to pick out a weak signal, when with 100 watts you can work him OK".

This is not an unreasonable argument, provided that DX and QRN conditions are "reasonable" at the time you want to make your contact.

However, there are some for whom "reasonable" conditions and 100 watts rigs are too easy – no challenge! These joys are supplied by making and operating home-brewed equipment and seeing that everything works properly and to its best ability.

Of course, there is some really good commercially made gear on the market and for myself this would be the way to go for SSB work, unless you are an experienced home-brewer. Against this, a small one or two watt CW transmitter is not specially difficult and can give great satisfaction. (Would that I had had something like that on my recent trip to VK4, because even though I wrote a few months ago about fitting HF into the car, I finally went with no radios at all.)

I mention this because QRP has a quite large following in many of the American contests and to a lesser extent amongst the Europeans. Looking at some of the USA QRP results, the top scorers are often well on the way to the same levels as the Big Guns. The drives are obviously:

1 to have the best antenna systems possible (after all, a beam or stacked array will give proportionally better results to QRP as it will to a kilowatt signal),
2 a keen technique of learning to judge just when, where and how to make your call in a contest, and
3 sheer dedication.

Admittedly, working from VK or ZL brings many problems of distance to the QRP enthusiast if he is to make it to USA or Europe; but it really teaches how to sharpen one's technique and it is genuinely good fun mixed with the frustration of having to repeat your callsign umpteen times to get through the racket of the kilowatt boys. If you feel like trying something different in a local contest, give QRP a try – even if you just turn down the output of your "big rig".

Two dedicated Australian QRPers that I feel should be mentioned are Doc VK5BUG/QRP (whose signal in the recent RD Contest was magnificent!) and Bob VK2AVQ/QRP, a keen home-brewer who uses his rigs on QRP Nets and in contests.

These are not the only operators in VK working with QRP, but they would be the two most frequently heard by me. So if you ever hear these operators on air, they are well worth talking to about their interest in low-power operating. Doc, I know, has been working on a magnificent vertical for QRP work on 80/160 metres, so I look forward to seeing an article from him in one of the future issues of this magazine.

So if you want something different, try QRP – achieve more with less!

RD Results

As I prepare these notes I have just heard which State won this year's RD Contest, apparently by a very large majority of points (I have not yet seen the scores at this stage).

I trust that you will join with me in congratulating the VK6s – a good effort. However, it again raises the subject of the attempts to revamp the rules that were tried this year. There must be many thoughts amongst you out there, so if you would like to pass them on, please contact either Chris Edmondson VK4AA, or me.

2006 Calendar

Attached is the Calendar of Contests for 2006. Please put this up on your wall for next year so that you will have plenty of time to prepare yourself.

Finally, thank you all for your participation in our contests in 2005. Have a very happy Christmas and New Year and try to take part in the Ross Hull Contest and VHF Field Day in mid-January.

VK CONTEST DATES 2006

January	**14**	**Summer VHF Field Day**
	14	**Last day of Ross Hull VHF Contest**
March	**18/19**	**John Moyle Field Day (CW/SSB/FM)**
April	**22**	**Harry Angel Sprint (CW/SSB)**
May	**20**	**VK/trans-Tasman 80 metres SSB**
June	**3**	**VK/trans-Tasman 80 metres CW**
	10/11	**ANARTS RTTY Contest**
July	**8**	**VK/trans-Tasman 160 metres SSB**
	22	**VK/trans-Tasman 160 metres CW**
August	**5**	**QRP Day**
	12/13	**Remembrance Day Contest**
October	**7/8**	**Oceania DX Contest SSB**
	14/15	**Oceania DX Contest CW**
November	**18**	**Spring VHF Field Day**
December	**26**	**Ross Hull Memorial VHF Contest**

Results: 25TH ALARA Contest

27/28th August, 2005

Rosanne VK7NAW	528	Top overall, Top novice, Top phone, Top VK7 member
Marilyn VK3DMS	380	CHECK LOG
Chris VK2LCD	294	Top VK OM
Pat VK3OZ	291	Top VK3 member
Celia ZL1ALK	263	Top DX member, Top ZL member
Gerald VK2HBG	249	
Susan VK7LUV	235	
Dot VK2DB	231	Top VK2 member
Margaret VK4AOE	204	Top VK4 member
Christine VK5CTY	195	Top VK5 member
Shirley VK5JSH	164	
Mike VK3AVV	164	
Jenny VK5ANW	160	
Gwen VK3DYL	154	
Kathy VK3XBA	142	
Alan VK8AV	135	
Bron VK3DYF	121	
Peter VK2ZPT	114	
Robyn VK3WX	103	
Barry VK5BQ	80	
Alan VK7JAB	80	
Ian VK3JS	70	
Colwyn VK5UE	70	
Mavis VK3KS	68	Top VK YL CW
Rosa VK2HOP	57	Top YL non-member
Steve VK5AIM	40	
Elizabeth VE7YL	35	Top VE member
Muriel VK3KNM/2ndop.	32	
Lesley VK5HLS	24	
Lyn VK4SWE	24	
Ray VK3HSR	20	
Rod VK2DAY	15	

SUMMARY:	ALARA members	19 (DX members 2)
	YL non-members	1
	OMs	12
TOTAL LOGS		32

This year was a wonderful success – the conditions were much more favourable, and the inclusion of the triple points to celebrate ALARA's 30th anniversary proved very popular. It was a pity that there were not more of the 'oldies' on air, but for those who were it was great fun.

Some of the comments received: "It must be the most leisurely contest on the calendar"..."Thanks for a great friendly contest"..."It was indeed a pleasure participating in the contest"... and all these comments came from OMs!

Its great to know that our efforts are appreciated by so many, and yes we do set out to make it as friendly as we can.

However there was at least one log which plainly showed that very little notice was taken of the 'oldies' telling of their bonus points as the scoring was all over the place. However the score was adjusted so that it read correctly! Some Contest Managers are kindly!

Rosanne VK7NAW must be congratulated for a great score on her very first contest.

Chris VK2LCD, our winning OM, certainly had a much better contest this year, and it is a pleasure to note his top score.

I would like to especially congratulate Rosa VK2HOP, who

9 Band DXCC Presentation

21 October 2005

Michael Owen VK3KI

This has been a momentous week in amateur radio, with the coming into force of the statutory instrument, the ACMA Determination that created the Foundation Licence and effectively bundled up our existing licences into the Standard and Advanced licences.

One of the great things of amateur radio is that it encompasses so many quite different aspects. One of those areas of special interest are the various awards, and the WIA is very lucky that our Awards Program is run by someone who is totally committed and very determined, and who has used the need to change the awards to reflect the new national WIA by not just removing the word Federal, but creating a whole range of new and exciting awards. That is, of course, our WIA Awards Manager, Mal Johnson, VK6LC.

Tonight I have the privilege of making a presentation on behalf of our WIA Awards program, presenting David McAulay, VK3EW with the very first WIA 9 Band DXCC Award, certificate number 1, which he achieved last May.

And, just saying that, compels meto say to David that I do hope that you don't think that this presentation has been unreasonably delayed, but I have been away for some 6 weeks, and it was necessary to find a suitable time and place to make this important presentation.

A 9 band DXCC is no small achievement. 100 stations in 100 countries 9 times over are, as the certificate says, 900 countries! To achieve that involves rare perseverance, equipment that really works, and special skills.

Mal tells me that David would be our youngest top VK DXer all rounder, gaining his first DXCC Certificate in November 2000, his 5 Band DXCC in March this year, and only a few months later this award. Mal also acknowledges David's help and contribution to the WIA Awards Program.

Mal has asked that I pass on to you, David, his personal message, which is:

"Congratulations David for your outstanding DXCC achievements. It's been our pleasure processing them for you. Being as you are a "World Class DX operator", and a dedicated person, I hope you find our WIA awards memorable. We trust that this will not be the end and our invitation is for you to continue displaying your personality and special skills."

David, congratulations on this fantastic achievement.

ar

Results - ALARA Contest *continued*

was very newly on air, and I think had a wonderful time. By the time she reads this she will be a member of ALARA, and we welcome her.

I think the lack of DX members on air this year may have something to do with the closeness of the contest to the Alarameet, which was only two weeks later. Many of the girls were busy with travel plans, for which we can forgive them.

There will of necessity, due to the changes in licensing, be some alterations in the rules for the 2006 contest, so make sure that you check these beforehand. The 2006 contest will be held on August 26/27, so hopefully we will all meet there again along with some of the newcomers to the bands.

33

Marilyn VK3DMS

ar

VHF/UHF - an expanding world

David Smith VK3HZ – vk3hz@wia.org.au
Leigh Rainbird VK2KRR – vk2krr@wia.org.au

Weak signal

David Smith - VK3HZ

With the reshuffling of licensing now complete, it's good to see a number of Standard Class licensees now making the most of their newly authorised access to the weak signal ends of the VHF/UHF bands.

Chris VK3VSW near Geelong puts out a good signal on 2 m. and is working on his antenna for 70 cm. Chris has made regular appearances on the morning Aircraft-Enhancement (AE) net, working stations around Canberra and up as far as Leigh VK2KRR near Wagga Wagga.

Rhett VK3HAP, north of Bairnsdale, has set up a portable station in his front paddock, operational on both 2 m and 70 cm.

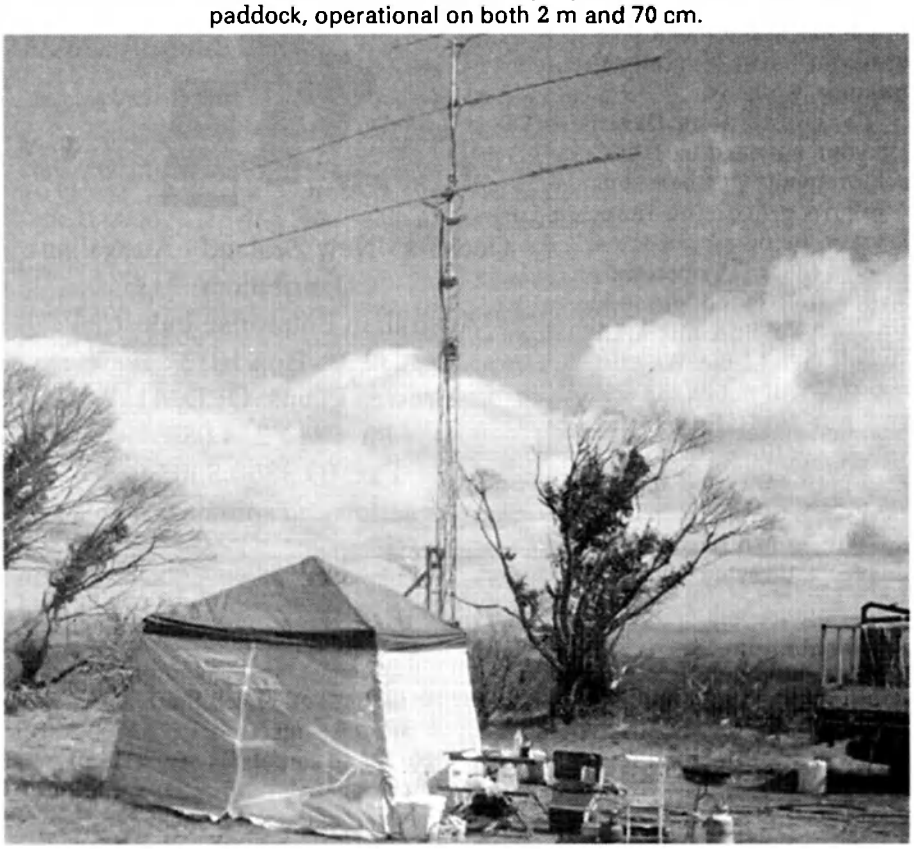
Rhett has also had a lot of success with the AE net, working many stations in the Canberra region. Rhett has also been quite active on the Wednesday evening 144.150 MHz Net run by his near neighbour Rob VK3EK.

As we move into summer and the band conditions improves, hopefully we'll see many more new and enthusiastic stations on the low ends of the bands.

Spring VHF/UHF Field Day

The Spring VHF/UHF Field Day was held over the weekend of November 11/12. In VK3, the weather was reasonable (one might say "for a change") and there was a good turnout of field stations.

The Geelong ARC (VK3ATL) once again located themselves in the Barrabool Hills west of Geelong and provided big signals on all bands from 6 m to 10 GHz. The SERG / Mt Gambier (VK5SR) set up late on Saturday afternoon, managing to work the GARC on all bands from 6 m to 10 GHz. Rod VK2TWR and friends headed to Kings Cross (no, not THAT Kings Cross) in the Snowy Mountains. Jim VK5OM was back at his old haunt in VK3, north of Nhill. Gavin VK3HY on Mt Terrible was putting good signals into Melbourne, once he'd fixed a dodgy connector. VK3III (Geoff VK3FIQ and others) went out to Corn Hill, south of Ararat. Ken VK3DQW was located north of Geelong somewhere, with a good outlook across the water. Barry VK3BJM headed up to QF13 on Saturday afternoon, intending to enter the 6 hour section, but was having so much fun that he remained there until the end of the contest on Sunday. Ken VK3AKK went out on Sunday morning into QF23 to provide some numbers. VK3HZ even managed to get out to John's Lookout in the Dandenongs to work the GARC on 2.4 GHz and 10 GHz – the first "real" contact (i.e. further than across the backyard) for the 10 GHz setup.



VK2 entrants in the Spring VHF/UHF Field Day. Rod VK2TWR and friends headed to Kings Cross (no, not THAT Kings Cross) in the Snowy Mountains.

Thanks to all who took the effort to go out onto a hilltop (apologies to those I missed), and also to those home stations who came on air to add numbers.

VK/ZL VHF-UHF Propagation Logger

Adam VK4CP has been doing quite a lot of work on the logger software, adding very useful features, including a personalised weather report. With the good propagation season approaching (we hope), I'd advise people to visit the site, enter/update their operator information, and then keep an eye out for any reports of openings. The logger may be found at www.vklogger.com

Associated with the logger is the VHF/UHF Discussion Forum - . www.vklogger.com/forum/ If you have a question on a VHF/UHF matter, join the forum and ask away!

Wednesday Evening "150" Net

Rob VK3EK reports on recent activity on his 144.150 MHz (plus) Activity Net. On Wednesday 26th October, we welcomed three new Standard Class stations to the Net. It was fantastic to see that some of the new stations that had just got their new privileges to be able to operate on 144 MHz SSB had been building antennas and getting themselves set up. The night was very active on 144.150 MHz with a call in list as follows: John VK3ACA, Craig VK3CMC, David VK3HZ, George VK3HV, Peter VK3NPI, Rhett VK3HAP, Steve VK3NF, Joe VK7JG, Ken VK3DMW, Jim VK3ZYC, Brian VK3NAY, Ian VK3AXH, Ken VK3YDK and Bob VK3AJN.

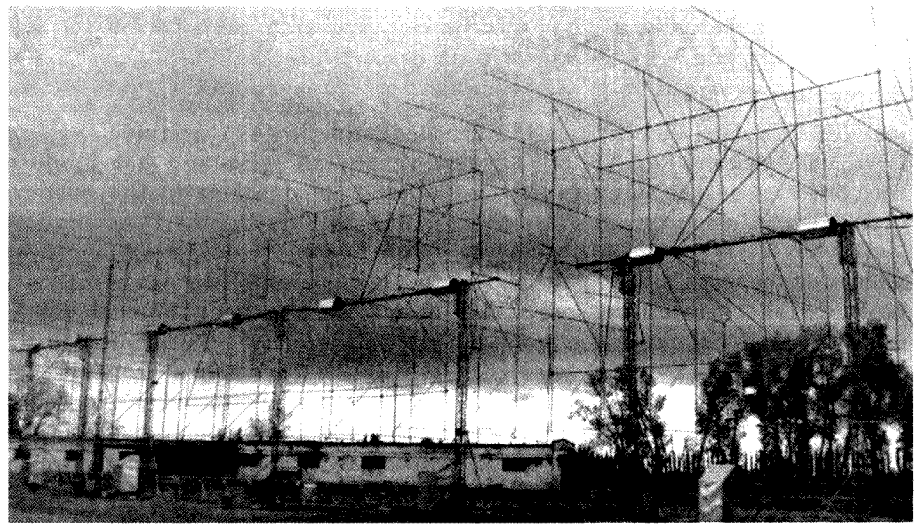
On 432.150 MHz, the call in list was: David VK3HZ, Jim VK3ZYC, Geoge VK3HV, Rhett VK3HAP, Ken VK3YDK, Steve VK3NF and Peter VK3NPI.

On 1296.150 MHz, the numbers dropped, the only call in was George VK3HV. There were no takers for 2403.150 MHz as conditions on the higher frequencies were unfavourable.

The net is on every Wednesday night at 2030 local time. If you need a reminder, check the VHF Logger as Adam has got it on the Calendar. We are now getting into the warmer weather so will hopefully get some good propagation and also more comfort in those out door shacks.

Till next time on the band, Rob VK3EK

Rob has been running the 150 net for many years, and is nearly to its 400th happening. Perhaps others in other states should think about starting such a net to encourage local activity. I would be happy to publicise it here.



One of the "big guns" of EME has become even bigger. Sam RN6BN has one of the biggest signals on 2 m, running an array of 32 x 15 element cross-polarised yagis. He recently added extensions on each side of the array, taking it to 64 yagis. That's a stunning total of 1,920 elements. This may well be the world's largest 2 m array – I'm not aware of any bigger. The array not only turns and elevates, but the whole system can be raised and lowered, presumably to help with maintenance. Sam's web site (www.73.ru) has a short video showing the array performing all its moves.

EME

The ARRL EME contest sees a large turnout of stations around the world. This year, it was held over two weekends – October 22/23 and November 12/13.

Doug VK3UM reports on his results for the first weekend. "Saturday polarization was either dispersed or 45 degrees offset from rise to set (quite unusual). Sunday was back to 'normal'. Little to no Libration was seen during both days. Sun noise measured on Saturday approximated 75 sfu. Activity out of NA not good, excellent from Europe (on Saturday). High declination weekends are fine in the Northern Hemisphere, but we hand walkers see the Moon skating along the horizon for longer periods of consequent ground noise. Apogee did not help either but you can't have everything ... it's always a lot of fun.

22/08/2005

N9AB, JA6AHB, JA2JRJ, K5GW, K0RZ, JL1ZCG, JJ1NNJ, K3MF (Did not complete), K1FO, 7M2PDT, OH2PO, OK1CA, DJ6MB, OZ4MM, OZ6OL, SV1BTR, SM3JQU, SP6JLW, UT2EG, FR5DN, UA3PTW, SM2CEW, RW3PX, EA3DXU, I5CTE, G3LQR, S52CW, DL7APV, G3LTF, HB9Q

23/10/2005

KL6M, SM2ILF, SM3AKW, S51ZO, G4RGK, DL9JY, DL0SHF

36 x 24 so far ... there are a huge number of regulars not in the above log!

You can only work those that are present! Thanks also to several 'smaller stations' (1 yagi) that reported hearing me, so conditions could not have been as bad as some believed. Persistence required! A special thanks to DL9JY who stuck around after I changed tubes and got going again after 6 minutes and also to FR5DN, when I also had a time out following an arc over. A new feed will be installed in the dish by next contest period and also (hopefully) a better final bottle will bring me back my current lacking of '3 dB transmit sensitivity'! (if I can find one in time). Can't rely on anything these days ... failing as a 'pull out' after 18 years faithful service!

73, Doug VK3UM

Finally, I hope everyone has a happy and healthy Christmas and New Year. May you be in the shack with the rig turned on and the antenna pointing in the right direction when that big opening to the exotic DX location occurs.

Oh, and Santa, I'd like an antenna just like RN6BN, please. I've been very good this year, really.

Please send any Weak Signal reports to David VK3HZ at vk3hz@wia.org.au.

Digital DX Modes

Rex Moncur – VK7MO

Ian, VK3AXH; Des, VK3CY; Jim, VK3II; Dave, VK2AWD and Rex, VK7MO have been checking out the new beta version of WSJT and providing feedback to Joe Taylor, K1JT. On FSK441 we have found that the waterfalls do not always provide a reliable manual decode. This is due to a bug that causes the point of decode to vary from the point where the meteor shows on the waterfall. There is also timing problem such that the DT is out by one second, which shows up as a difference of two seconds between two computers. Essentially this means that if both computers are on time they will both show a DT of plus one second. Both of these problems, as well as others discovered elsewhere, should be corrected in the next version, 5.8.7 that should be available as you read this.

Peter, VK5ZPG, at Quorn near Pt Augusta is active, transmitting first period, in the hour before the normal weekend FSK441 activity session on 144.230 MHz and has made a number of contacts to the Eastern States. He says that he is having lots of fun and has rejuvenated his interest in Amateur Radio. His experience is a good demonstration of how the digital modes can allow operators in remote areas to remain active on 2 metres. On one occasion he detected part of a burn that ran for 42 seconds and took the opportunity to inject some Australian context into meteor scatter nomenclature by coining the name "bushfire" for long burns, which we will define as more than 15 seconds.

Congratulations to Bob, ZL3TY, on extending his own World 2 metre EME Record to 19434 km with a contact to EA2AGZ and to Nick, ZL1IU, who a few days later worked EA5SE and extended the record to 19451 km.

With Nick, ZL1IU, up and running on the digital modes, he accepted a proposal for a meteor scatter test to Hobart over a distance of 2431 km. This is around the theoretical maximum for meteor scatter and requires the meteor to be very close to the centre of the path and to ionise a little higher than the average. As such it is a real long shot, but not impossible as some recent contacts have been made between Europe and Russia up to a little over 2500 km. In two hours testing only one signal was detected but it was a good short burn of 1.5 seconds with both calls being repeated three times, which at least suggests it is possible. We will try again during the Geminids. With Nick, operational on FSK441, it should be possible to work to the North Island of New Zealand from much of the East Coast of Australia.

Please send any Digital DX Modes reports to Rex VK7MO at rmoncur@bigpond.net.au.

The Magic Band – 6 m DX

Brian Cleland – VK5UBC

Although some have been of short duration several openings occurred during October and on several occasions beacons were heard without contacts being made.

A good opening occurred on the 3rd October over much of the country. From my portable QTH at Corny Point (PF85mc) the band was open to VK1, 2, 4 & 6, the opening to VK6 lasting several hours but with only John VK6JJ & Wayne VK6JR available to contact. On the same day Norm VK3DUT reported hearing the Alice Springs beacon and had an interesting contact with VK2YVG Broken Hill 5x9+ on his 10 W.

On the 12th October Norm worked Roy VK4ZQ, Wayne VK4WS both 5x9 and on the 17th October heard the Gold Coast beacon VK4RGG/b 529. Then on the 18th October he worked VK4's WS, ADM, BIT, ARS, YRP, NW, SJ, BLK and Brian VK5UBC.

On the 22nd October a surprise opening to JA from VK3 when Norm V3DUT heard JA7/b then worked 25 JA stations in the 1, 2, 6, 9 and 0 areas with many signals over S9, not a bad opening for bottom of cycle. Rob VK3EK, who alerted Norm to the opening also, worked a good number of JAs.

To complete a good month for Norm he also reports hearing the FK8 beacon on the 29th October and ZL TV on the 30th.

A lot of activity occurred on the 17th and 18th October with Neville VK2YO from Northern NSW working VK5UBC and VK7ZIF. Brian VK5UBC also reports working John VK2HO and Brisbane stations on these days. Wayne VK4WS worked several JA stations on the 17th with Trevor VK4AFL heard working JA1RGU using 30 W and a dipole with 5/9 reports.

The Alice Springs beacon was also heard in Adelaide on the 17th & 20th October.

On the 22nd October Ray VK4BLK from Yeppoon worked several VK3's as well as VK5UBC.

Another big JA opening from the Brisbane area on the 5th November with Wayne VK4WS working many JA's on both CW & SSB. On the same day the band opened from VK2 (Sydney area) to VK5.

The Barossa Club is in the process of establishing a new 6 m beacon from the Barossa Valley area. It will be located at the same location as the Barossa 2 m & 70 cm repeaters, Mt Kitchener in the Barossa Valley, which is 580 m above sea level and 80 km north of Adelaide. The beacon will be running CW with the callsign VK5RBV on the frequency of 50.315 MHz. It will be running approx. 20 W and using a Halo antenna. At the time of writing it is in test mode and should be fully operational by December. The club would welcome any reports to vk5brc@gmail.com.

By the time the December magazine is printed the 6 m summer DX season should be in full swing. Historically the bottom of the sunspot cycle produces good sporadic 'E' seasons. I'd like to thank all those who have forwarded me information for the column throughout the year and wish everyone a Merry Xmas and Happy New Year.

Please remember to send any 6 m information to Brian VK5UBC at bcleland@picknowl.com.au.

2 m and 70 cm FM DX

Leigh Rainbird - VK2KRR

Welcome to the October report. Conditions down south were poor for most of the month except for the first few days. But, tropospheric conditions in Queensland were, as they say, on the boil, with a few international tropo contacts thrown in to boot.

On the 01/10, conditions in the morning began very well down the VK4 coast. Many good contacts were available for those in the know. Some of the better contacts were; from Mike VK4MIK near Cairns, who worked to VK4RGA Monto repeater at 951 km, VK4RBU Bundaberg repeater at 1000+ km, VK4RGY Gympie at 1227 km, VK4RHY at Hervey Bay and VK4RGT at Gladstone. Mike also worked simplex with Noel VK4VJ, Wayne VK4ZRT and Mike VK4JOO all at Gladstone. Mike VK4JOO is 1160 km distant from VK4MIK and was VK4MIK's first simplex contact over 1000 km.

Along with Mike, Felix VK4FUQ was also working a number of DX repeaters such as Mackay, Hayman Island and Monto from Felix's QTH at Ingham.

On 03/10, conditions were again good in VK4. VK4MIK worked down the coast about 550 km distance to around Mackay. Mike also made simplex contacts on 146.500 MHz with Wal VK4AIV and Rick VK4AIM. Mike also worked to the Townsville 70 cm repeater a number of times.

Mike also reports that Gary VK4ABW at Townsville was able to work across to the FK8ZHA 146.800 MHz repeater on Mt Doo at New Caledonia. Garry worked FK8AH and FK8GX. This is a good 2000 km for Gary.

On 04/10, down in the south east corner some good contacts were had. From my QTH I could access most of the VK5 repeaters, which included Port Lincoln on 146.750 MHz, which was a 5/9 signal at 1019 km. Murray Bridge and Lobethal were 5/9+40. VK5UBC at Corny Point was able to get to some VK3 repeaters and I worked Brian on 146.500 MHz for a nice 914 km contact, though the signal was only 5/3.

On 05/10, Mike VK4JOO at Gladstone was able to access the FK8ZHA repeater at New Caledonia - a distance of around 1560 km for Mike. Disappointingly for Mike, at that stage there were no operators about to answer his calls.

Also on this date, some very good tropo occurred from inland southern NSW up to the north toward Brisbane. Alan VK2KAW in Wagga mentions being able to work up to 24 repeaters to his north. One good example is the Tamworth repeater on 146.750 MHz. Meanwhile John VK2YW mobile in Wagga was able to access many repeaters such as 146.900 MHz from Condobolin and 146.775 MHz from Young.

On 06/10, some fairly selective conditions from my QTH at The Rock. I had Renmark TV on 143.760 MHz running full scale at 600 km. Also had access to Port Pirie at 867 km and Port Augusta at 913 km.

On this date Felix VK4FUQ also reports being able to weakly hear the New Caledonian repeater on 146.800 MHz FK8ZHA.

On 07/10, a break through for Mike VK4JOO, who this morning made it back into the FK8ZHA repeater and finally found some stations to make contact with. These were FK8AH and FK8GX. Mike's signal from the repeater was 5/9+40. Mike then worked FK8GX on simplex and reports a 5/4 signal.

On 08/10, Burnie VK4KAC, who I think is in the Brisbane area, reports that he was able to get to repeaters at Bundaberg, Glen Innes, Coffs Harbour and Lismore. Burnie also got way out to New Caledonia but reports no one was awake.

Today, Felix VK4FUQ was able to hear the Gympie repeater on 146.625 MHz, but was very frustrated when he was unable to break into the stations talking on the repeater due to lack of time left between overs.

Felix also made it to the Mackay repeater where he worked with Rick VK4AIM in Mackay and John VK4FNQ from Charters Towers. Felix was able to work Rick on simplex to top the day off.

Between the 18th and the 22nd of October, Tony VK3TLA was maritime mobile in the Bass Strait with some 2 m & 70 cm equipment. Tony mentions that while in transit from Westernport to Deal Island, he was able to work some VK7s on 2 & 70 FM. The best contact was from a station at Penguin (VK7BBW?) using the VK7RWC repeater, this was around 320 km and others on the east coast were in the order of around 250 km.

Finally on the 25/10, Russ VK4BEG near Cairns was able to work to the Townsville repeaters on both 2 & 70. The 2 m repeater was peaking 5/9+40. Russ worked John VK4FNQ on the Townsville 70 cm repeater and the on 70 cm simplex.

Hope you all have a Merry Christmas and New Year and are able to catch some good DX over the summer season. Good luck.

Please remember to send through any 2 & 70 FM DX reports to Leigh VK2KRR at vk2krr@wia.org.au

ar

The VK5BR-X antennas

Some modified ideas on how they work and how they perform

Lloyd Butler VK5BR

(Further experimentation has revealed more about the causes of rise in antenna resistance. Also we see that more radiation can be achieved by unbalancing the antenna circuit.)

Earlier estimates of radiation efficiency in the X2/X3 antennas were based on measuring the difference between total antenna resistance and series coil loss resistance. The difference was thought to be radiation resistance resulting from the crossed E and H fields. It is now clear that this difference is due to other factors and the antennas are now not considered to be operating in a crossed field mode.

Further experimentation has also shown that, rather than be enhanced by crossed fields, the radiation can be increased by connecting the antenna circuit so that it is out of balance. This causes a common mode current component in the feeder, particularly high at the antenna end, so that the antenna itself forms an efficient top loading element for the common mode current as a radiator.

Forward

The original concept of the X antennas was based on the controversial crossed field theory. The open magnetic fields from coils in series with the short dipole legs are arranged so that they interact with the electric field between the two dipole legs. It was considered that at least part of these fields would be at right angles to the electric field and, because the current through the coils must be in phase with the voltage across the antenna resistive load, the magnetic field from the coils must also be in phase with the electric field across the dipole. This made up much of the requirement for crossed field antenna operation. For more detail, refer to the article on the X antennas in *Amateur Radio*, July 2004.

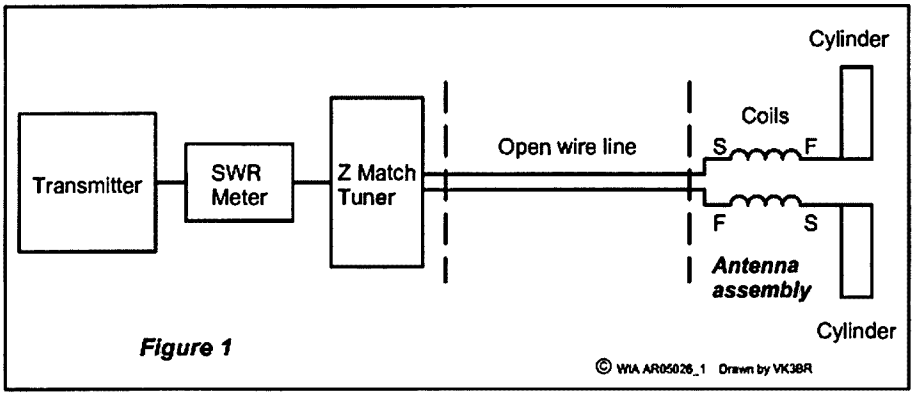


Figure 1 - Tuning arrangement VK5BR_X2 antenna.

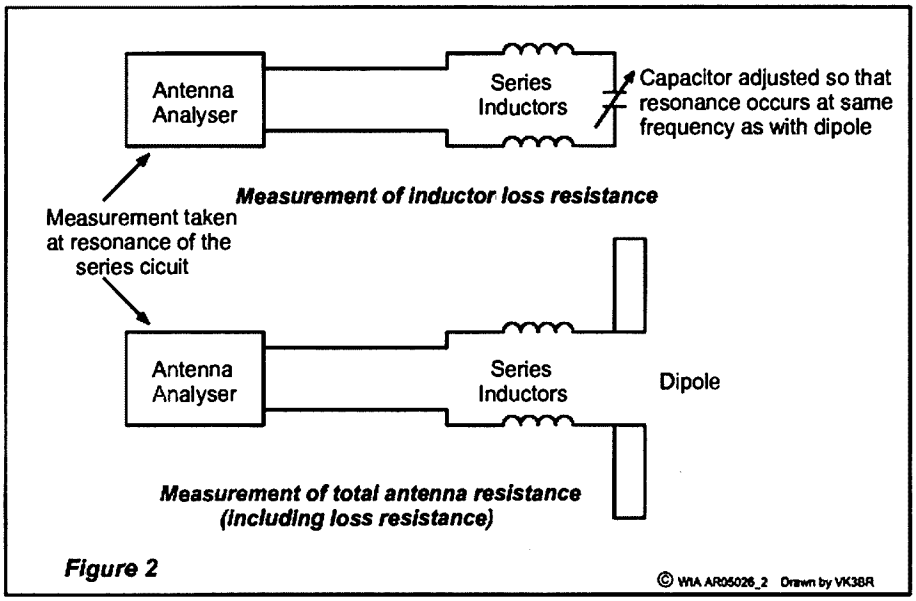


Figure 2 - Measurement of coil loss resistance and total antenna resistance.

The simplest form of the X antenna is the X2 connection shown in Figure 1. Here we have a balanced dipole antenna, about 2% of a wavelength, loaded with two series coils and fed via a balanced but tuneable line controlled by a Z Match Antenna Tuner.

The antenna dipole capacitance is very low and somewhat less than 10 pF for the higher frequency HF antennas, to a little more the 10 pF for the 80 metre antenna (so we see reactances of over 1000 ohms at 14 MHz and 3000 ohms at 3.5 MHz). The total inductive reactance of the two coils in series is selected close to the capacitive reactance of the dipole capacitive reactance at a frequency within the band of operation. Precise equality between the two reactances is not imperative as resonance at the frequency of operation is made with corrective reactance (where necessary) reflected up the balanced line by adjustment of the Z Match.

The total load resistance of this antenna was assumed to be the sum of the loss resistance in the coils and the load resistance presented by the antenna, resulting from electromagnetic radiation and induction into nearby objects. Measurement of coil loss resistance and total resistance of the antenna series circuit is shown in Figure 2.

Based on formulae to calculate radiation resistance, a dipole of about 2% of a wavelength would have a radiation resistance of around 0.1 to 0.2 ohm. So, in measuring total resistance of the antenna, a resistance close to that of the coil loss resistance would be seen.

Coil loss resistance varies between around 4 ohms for 10 metres to 10

ohms for 80 metres. However, in making measurements, total resistance considerably higher than the loss resistance has been recorded in the region of 15 to 40 ohms. Some of this can be shown to be induction into objects or earth which are too close to the antenna. But the remainder has been taken as radiation resistance very much higher than that of the calculated figure for the basic dipole and assumed to be due to the interacting E and H fields.

A questionable aspect of this explanation is that the antenna still seemed to work when the coils were rotated by 90 degrees away from their maximum line of field. This was discussed in my article in Amateur Radio, April 2005 and explained away by virtue of the fact that a field around an open coil spreads at all angles.

It was suggested to me that the theory of interaction could be tested by substituting the open coils with two coils of equal inductance but wound on toroidal iron dust cores. This would confine their magnetic fields essentially to the toroidal core and limit most of the interacting magnetic field.

So I wound two coils (Figure 3), 6.5 µH (23 turns) on 50 mm T200 iron dust cores and tried them on both of the 20 metre X3 antennas I had, but used the X2 connection because I needed to take resistance measurement. The series loss resistance measured at resonance, with a fixed capacitor substituted for the antenna capacitance, proved to be 1 or 2 ohms less than the open coils.

Assuming that all the magnetic field from the toroidal coils was confined, the resistance reading with the antenna dipole connected should have been almost the same as the previous coil loss resistance reading. Not so! In fact, the total resistance with the toroidal coils was considerably higher than with the open coils. This resistance on one antenna, resonating at 14.8 MHz, was as high as 24 ohms, nearly three times the loss resistance. It almost suggested that the circuit with the highest unloaded Q gives the highest radiation resistance.

Further to this, when powered the antenna seemed to be operating and radiating at least as well (if not better) when using the toroidal coils.

All this leads to assumption that my original theory for the X2/X3 antennas operating in a crossed field or field interacting mode was wrong. There had to be some other explanation why the apparent radiation resistance is raised well above that of around 0.1 or 0.2 ohms derived from common formula for the 2% wavelength dipole.

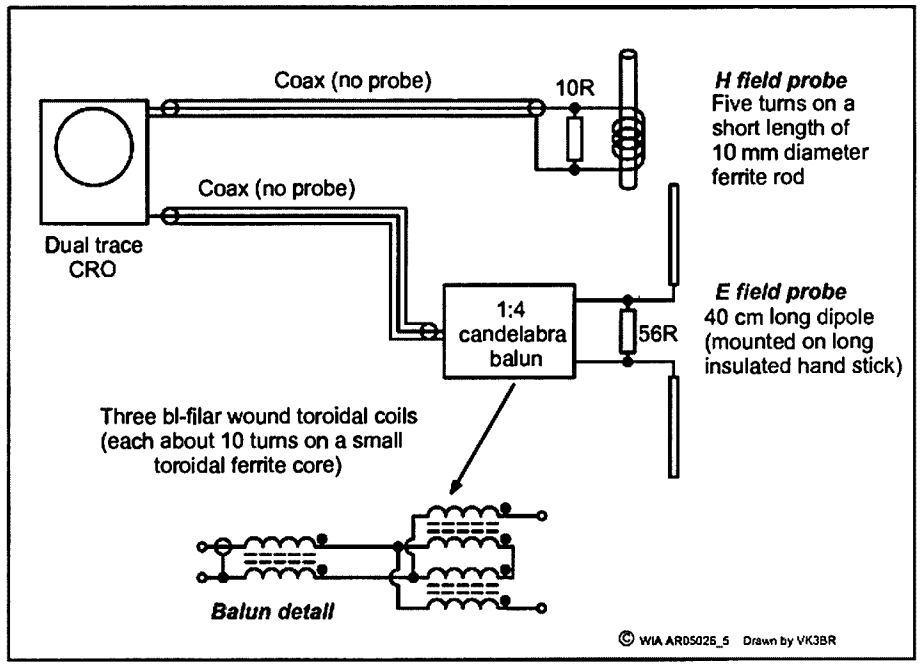


Figure 3 - Toroidal coil.

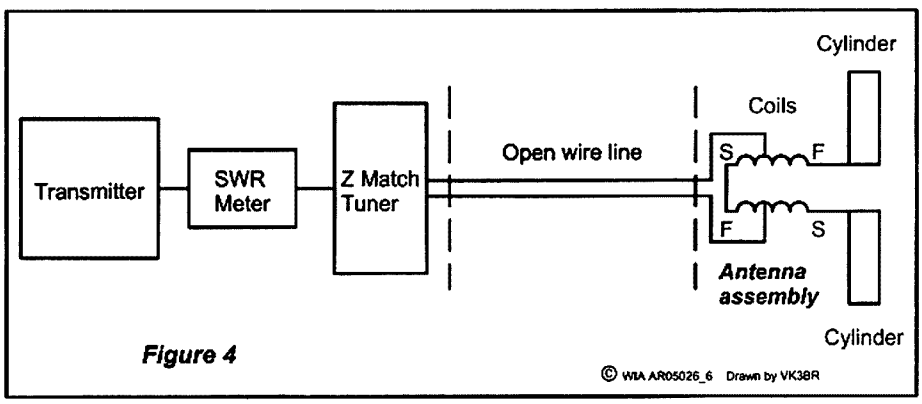


Figure 4 - 40 metre antenna assembly with centre of separating plates cut out.

Dielectric Loss Induction Loss.

My previous test procedure has been to assume that losses in the antenna circuit were essentially due to losses in the series coils. However, as discussed above, the high Q creates a very high impedance across the capacitance of the antenna. Quoting the example of a series resistance of 20 ohms and a Q = 50, the shunt resistance across the capacitance at resonance is 20 x 50 squared = 50,000 ohms. Such resistance could, in part, be due to excessive dielectric loss resistance in the insulating plates separating the dipole elements.

It seemed strange to me that the series resistance measurement on the 10 metre antenna was so much lower than the 20 metre antenna. The only difference was that the insulating plates for the 10 metre antenna were made of plexiglass (which appears to be a form of polystyrene) whereas those for the 20 metre antenna were made of hardboard. So I re-made the separating plates for the 20 metre antenna in plexiglass and this lowered the series resistance by about 8 ohms to a value nearer to the loss resistance determined for the coils.

I then operated on the 40 and 80 metre antennas. In these I cut the centres out of the hardboard separating plates so that a skeleton plate was left sufficient to fix the dipole elements apart and provide mounting for the coils (see Figure 4). This lowered the series resistance of the 40 metre antenna by 6 ohms and the 80 metre antenna by 5 ohms.

The resistances of these two antennas

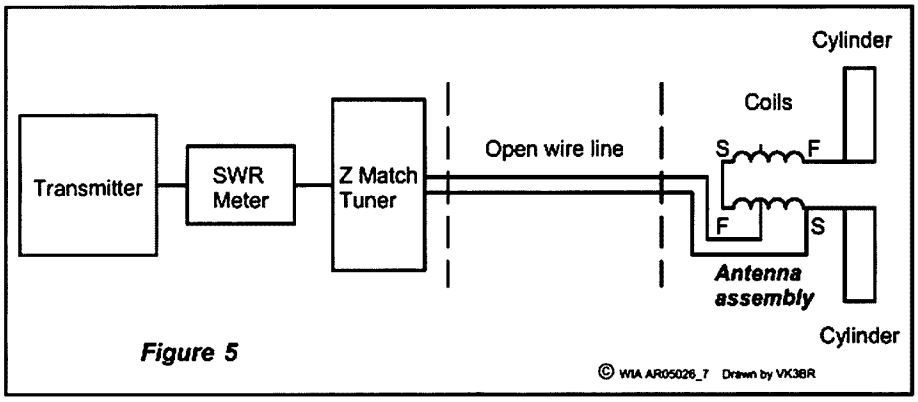


Figure 5 - Measurement of phase between E and H fields on X2/3 40 metre antenna.

were still considerably higher than the coil resistances, but at these lower frequencies it appears that considerable coupling takes place to surrounding objects and particularly earth. In particular, the resistance of the 80 metre antenna rises considerably as its height above the ground is increased, increasing to values as high as 44 ohms.

I thought to check out other available insulating materials, so I also tested the 20 metre antenna with plates made from PVC sheet and the 10 metre antenna with plates of polyethylene sheet. These gave similar results to the plexiglass. It was only my hardboard which clearly showed the high dielectric loss.

These latest tests have shown that this added resistance is more to do with dielectric loss between the dipole plates and induction loss than the result of crossing or interacting of the E and H fields as previously assumed.

The induction loss into earth and other objects is particularly apparent for the lower frequency antennas. It may be pure absorption loss but it could also be induction into other structures which re-radiate. This latter idea seems to have real significance if the field spreads around another antenna wire which happens to be resonant near the frequency of the local field or is harmonically related.

E-H phase Testing

The design of the X2/X3 antennas was originally based on the in-phase relationship between H field generated by current through the coils and the E field generated across the dipole plates. I checked this relationship with probes connected to a dual trace CRO. This was a bit tricky as the CRO leads pick up stray longitudinal voltage and give false indication of what is being read.

Figure 5 shows the arrangement I eventually used to carry out these tests on the 40 metre X2 and X3. As shown on the diagram, I cast aside the usual high impedance probes and used direct connection to the CRO inputs across a very low terminal resistance which discourages stray signal pick-up.

The H probe, placed near the end of either coil, had a few turns around a ferrite rod and terminated in a very low resistance (10 ohms) so that the voltage fed to the CRO depicts the current induced from the magnetic field.

The E probe was a short dipole which was terminated in as low a resistance as possible, but sufficient to get a reading on the CRO when the antenna was fed from the highest level available from my 'sig-gen'. By using this and isolating with my candelabrum balun to reject longitudinal pick-up, I was able to get sufficient pick-up of the antenna electric field by holding the dipole a few inches away from the centre of the antenna.

The tests were carried out for both the X2 and X3 connections and sourced with a signal generator fed direct to the antenna input as well as using the transmitter output fed via the Z Match and a short length of open wire balanced line. The tests confirmed the in-phase relationship required.

Interim conclusions

Referring to previous articles, I had assumed that the considerable rise in series antenna resistance was due to the crossed field condition set up by interaction between the E and H fields. However, the more recent tests show that is not the case and the antenna radiation is not being enhanced to a significant degree by the interacting fields. I have to assume one of the following:

(1) The fields are not correctly oriented or not in phase and my testing procedure to monitor this was inadequate in verifying this.

or

(2) The fields are oriented suitably for the crossed field condition but they do not produce the degree of radiation enhancement which has been promulgated as characteristic of a crossed field antenna.

Either way, I cannot continue to classify the antenna as working in a crossed field mode.

Actual radiation resistance is much lower than previously assumed and hard to quantify as a means to derive radiation efficiency. Claudio Re I1RFQ tried a different method. He carried out some field measurements on a 10 metre X3 antenna in comparison to a ground plane reference antenna. He derived figures of 10 dB down and an efficiency of the X3 as 10 %. In amateur radio terms this is about 1.5 S points down and seems to agree with some test reports I have received at 1 to 2 S points down on a full size antenna. Of course this was the original balanced X3 antenna and we are going to look further at what happens when it is put off balance.

The X3 antenna unbalanced

The original balanced 40 metre X3 antenna system is shown in Figure 4. The antenna is driven in its balanced form via open wire tuned line and a Z Match Tuner. In this arrangement, the antenna has been given signal reports around two S points below the level of a reference end fed half wave inverted V antenna with its apex about 10 metres above the ground. Received levels are also several S points below that from the inverted V. Considering that I now believe there is no enhancement from crossing E and H fields, these figures seem consistent with those which could be predicted from a simple dipole.

Much of the information gathered for the EH antenna seems to point to best performance when the antenna has a degree of unbalance to generate a longitudinal (or common mode) current in the antenna system. In both the L+T and Star EH antennas one dipole leg is directly connected to the braid side of the transmission line. For the L+L EH antenna it was necessary to wind one inductor with less turns than the other. The Star antenna in balanced form didn't perform so well.

On this theme, some tests have been carried out to see what happens when the X3 antenna circuit is deliberately unbalanced making it look more like the type of circuit used in the Star EH antenna which has one dipole element directly connected to one leg of its transmission line. I tried several connections using the coils as they exist with their fixed taps. The connection arrangement shown in Figure 5 seemed to produce the best field strength result. I will give reference to this antenna arrangement as the X3U.

Using this X3U arrangement there was still field measurable around the dipoles but much less than for the balanced connection of Figure 4. However, using an H field detector with LED display, I was able to track consistent magnetic field right down the length of the transmission line from the antenna to the Z Match output. This was clearly caused by unbalance of current between the two legs of the line.

The X3U antenna was hung about 2m above the ground with the feedline on average about 1.5m above the ground. There was 7 metres of feeder in open space plus 4 metres entry under the carport and shielded by its steel roof. On test, the received level now appeared slightly higher than the Inverted V antenna. On transmitting, I received several signal reports from stations on the east coast of Australian. These reports indicated similar signal levels being transmitted from either antenna. Further reports on another day from a network of stations put the X3 at a higher level than the Inverted V.

I concluded that by putting the short balanced dipole out of balance, the field strength is increased from that inherent to the short dipole to something close to that of a full sized half wave antenna.

I think the tuned dipole takes over as prime radiator to providing a differential termination for the transmission line. But because of the unbalance, a longitudinal (or common mode) current component also runs on whatever length of line is now left without a balancing or common mode rejecting interface. This current tends to be quite high at the antenna end of the antenna system compared to a base loaded antenna system which has very low current at its apex. It may be that the dipole, resonated with its inductors, forms a sort of top loading function to the common mode current component.

In May 2004 *Amateur Radio* I discussed how the unbalance leads to unequal dipole leg currents via capacitance to earth. Voltage at the dipoles is multiplied by the very high Q of the shortened antenna circuit; this leads to multiplication of those currents.

I figured that more measurement might reveal how the longitudinal current component might vary over the length of the line. It did seem to me that if the antenna coupling was set such that the dipole circuit loads the transmission line with resistance equal to the line characteristic impedance, current in the line (even if unbalanced) would possibly be fairly constant over its length.

I was able to monitor more carefully the relative strength of common mode current right down the line to the X3U by sliding a large ferrite toroidal core over both wires of the pair and coupling the core to a milli-ammeter with detector. The tests showed maximum common mode current at around one quarter wavelength down from the antenna and at about three times the current near the antenna input and the Z Match Tuner output. However, the current maximum could be shifted to the antenna entry point by shifting the location of the Z Match tuner so that the open wire line section was seven metres long and less than ¼ wave. In this case, the current was near constant to a about four metres down the cable, and falling to a low value at the output of the tuner. Despite this, the former test connection, with the longer line, produced higher signal level reports on air test..

I repeated the experiment for the 20 metre and 80 metre X3 antennas using the out of balance connection. Even better for these antennas, the common mode maximum was at the topmost end of the open line where I figured it could be most effective. For the 80 metre test, the common mode current was almost constant over the 13 metre length of line.

One objection raised for allowing the feeder line to be part of the antenna system in the EH antenna was the interaction between antenna tuning and the length or position of the feeder. The same applies to the unbalanced X3 but tuning correction is easily made in the radio shack using the Z Match Tuner.

Some conclusions

The original design of the X2/X3 antennas was based on the controversial cross field theory. Earlier measurements of high antenna circuit series resistance led me to believe that the antenna was working in this mode. However, more recent investigation has shown that as far as the balanced form of the antenna is concerned, the high value of resistance is due to other factors, not radiation resistance resulting from the crossed fields. I now assume that radiation from the antenna, in its balanced form, is simply that which can be predicted as normal in any dipole.

However, I have shown that by unbalancing the form of the dipole (as for the X3U connection) so that the feedline is activated with common mode (or out of balance) current, the radiation level can be raised to nearer that of a full sized resonant dipole.

So it seems that first setting out to make a balanced small dipole which was supposed to demonstrate how interacting or crossing its electric and magnetic fields could enhance its radiation, we have discovered that it doesn't. But, instead, if we put the antenna circuit off balance, we have a magnificent top loading device for a radiator formed from the feedline out of balance current. That is what experiments with amateur radio are all about.

A short note on EH antennas. Having written quite a bit about these and their operation in a crossed field mode, I now have similar doubts about whether this mode is the radiation enhancing factor. From what we have learned about the EH antenna, it's antenna circuit is clearly unbalanced and it does seem to need at least a short feeder tail for best operation. I suspect that the same sort of process takes place as I have described for the unbalanced X3.

References

1. Refer to articles on the VK5BR_X antenna in previous issues of Amateur Radio, November 2004, March and April 2005.
2. Refer to articles on the EH Antenna by VK5BR in previous issues of Amateur Radio, April and November 2003, and May, July and September, 2004.
3. Refer to articles on the X3 and the EH Antennas by VK5BR at http://www4.tpgi.com.au/users/ldbutler/

Or link from:- http://www.qsl.net/vk5br/

ar

HF Predictions

by Evan Jarman VK3ANI
34 Alandale Court Blackburn Vic 3130

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.
These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

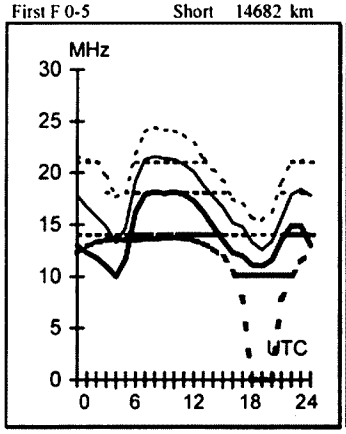
Shown hourly are the highest frequency amateur bands in ranges between these key frequencies, when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.
These predictions were made with the Ionospheric Prediction Service program: ASAPS Version 4

December 2005
T index: 19

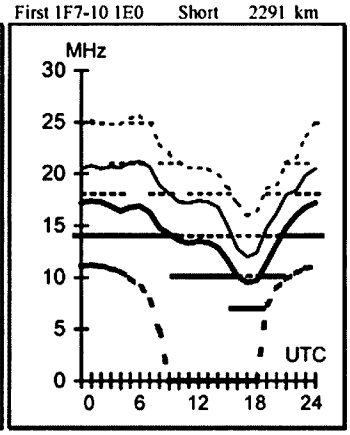
Legend

Frequency scale
UD
F-MUF
OWF
E-MUF
ALF
>10%
>50%
>90%
Time Scale

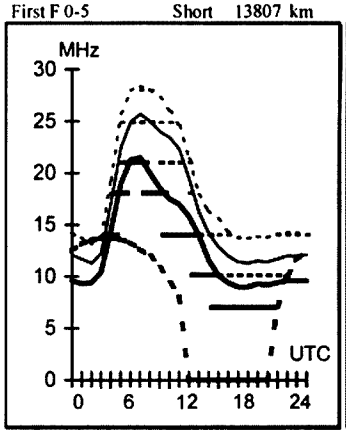
Adelaide-Accra 242
First F 0-5 Short 14682 km



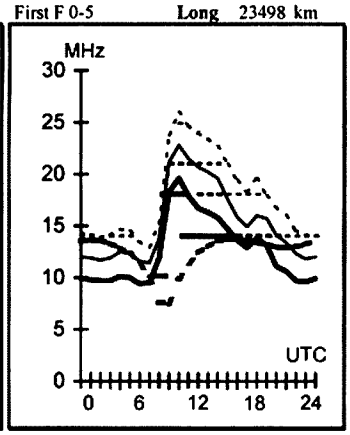
Brisbane-Auckland 123
First 1F7-10 1E0 Short 2291 km



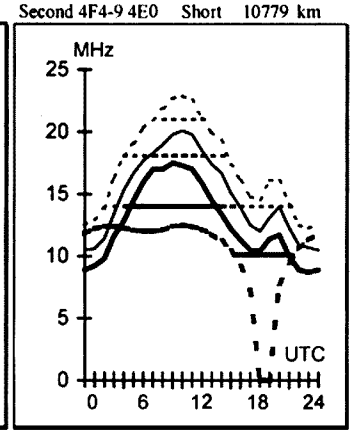
Adelaide-Moscow 318
First F 0-5 Short 13807 km



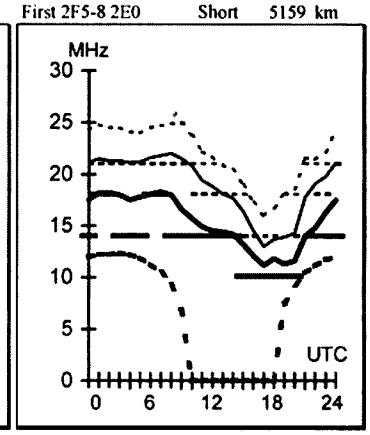
Brisbane-London 147
First F 0-5 Long 23498 km



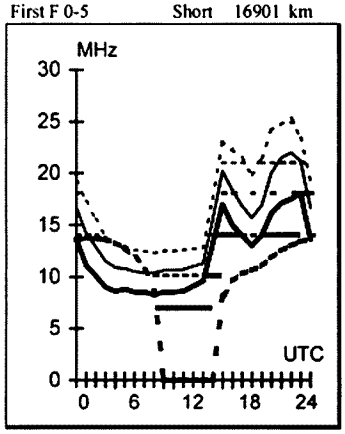
Canberra-Capetown 219
Second 4F4-9 4E0 Short 10779 km



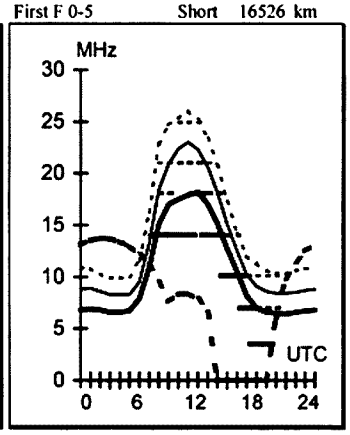
Darwin-Invercargill 144
First 2F5-8 2E0 Short 5159 km



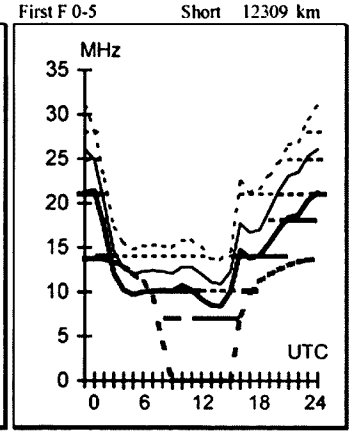
Adelaide-Ottawa 58
First F 0-5 Short 16901 km



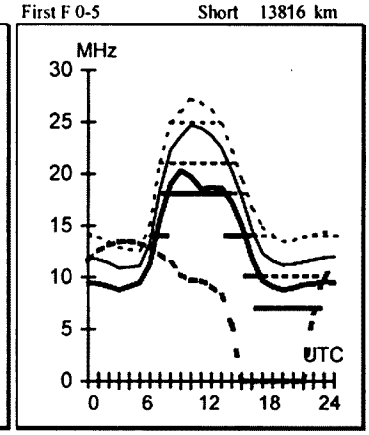
Brisbane-London 327
First F 0-5 Short 16526 km



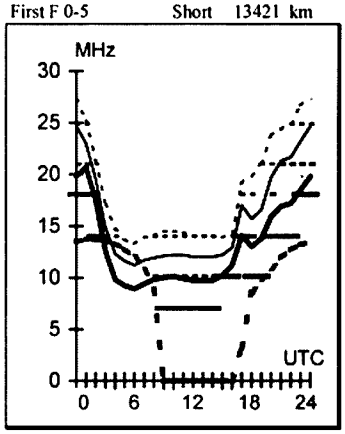
Canberra-Los Angeles 62
First F 0-5 Short 12309 km



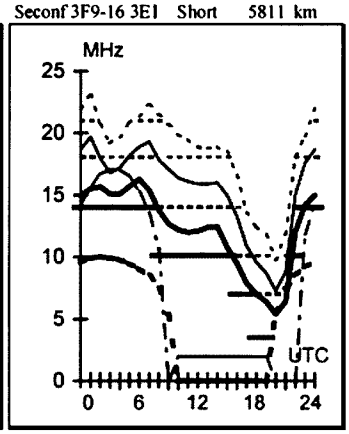
Darwin-Paris 322
First F 0-5 Short 13816 km



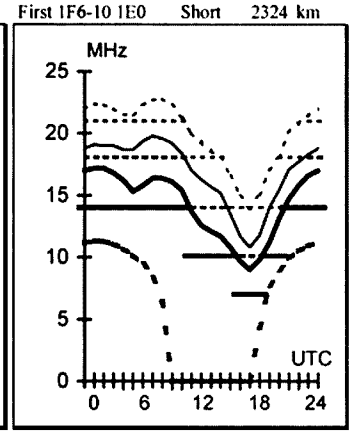
Adelaide-Vancouver 59
First F 0-5 Short 13421 km



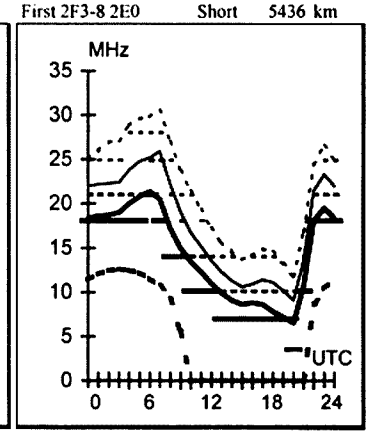
Brisbane-Manila 320
Seconf 3F9-16 3E1 Short 5811 km



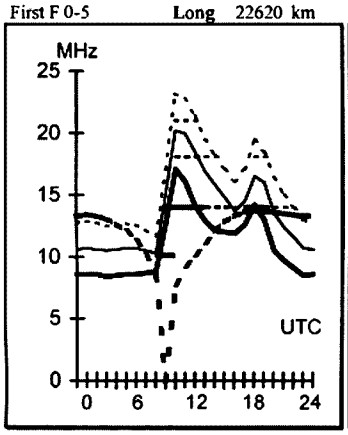
Canberra-Wellington 115
First 1F6-10 1E0 Short 2324 km



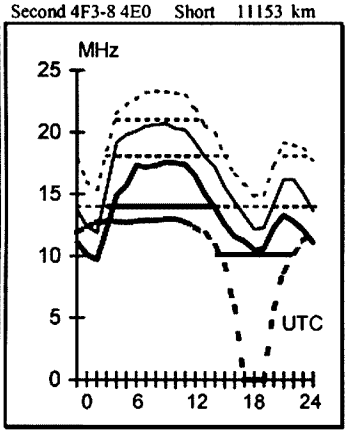
Darwin-Tokyo 10
First 2F3-8 2E0 Short 5436 km



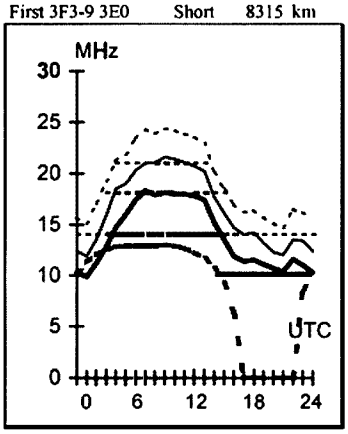
Hobart-London 123
First F 0-5 Long 22620 km



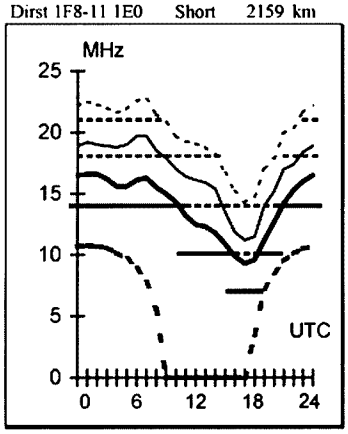
Melbourne-Lusaka 241
Second 4F3-8 4E0 Short 11153 km



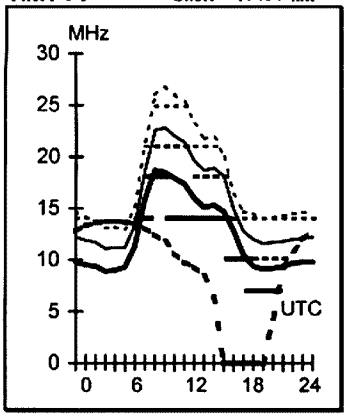
Perth-Johannesburg 248
First 3F3-9 3E0 Short 8315 km



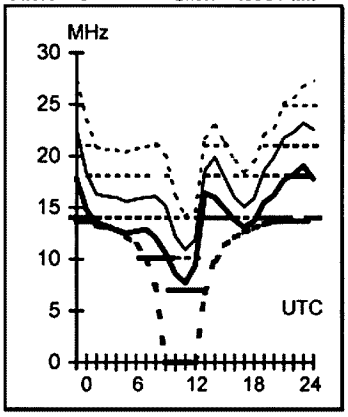
Sydney-Auckland 106
Dirst 1F8-11 1E0 Short 2159 km



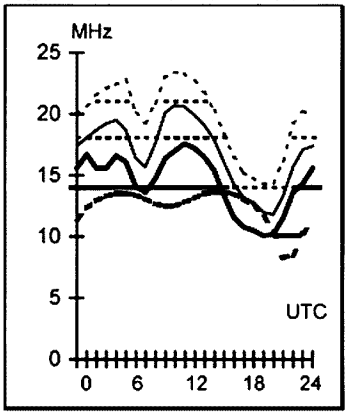
Hobart-London 303
First F 0-5 Short 17404 km



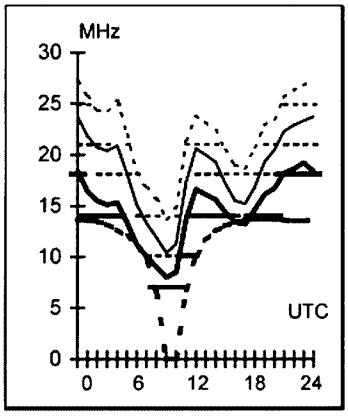
Melbourne-Miami 94
First F 0-5 Short 15584 km



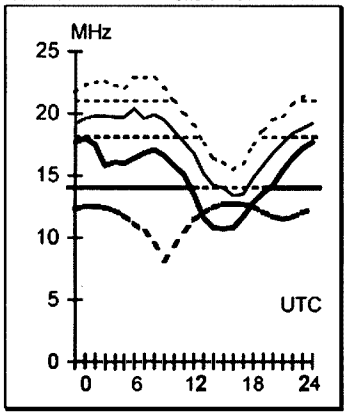
Perth-Rio de Janeiro 203
Fist F 0-5 Shorst 13523 km



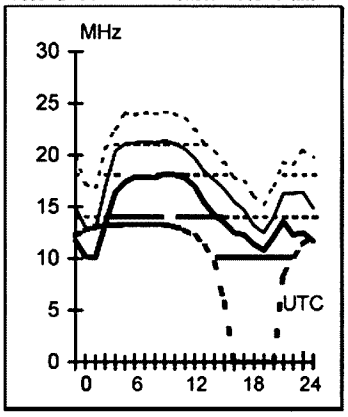
Sydney-Barbados 119
First F 0-5 Short 16155 km



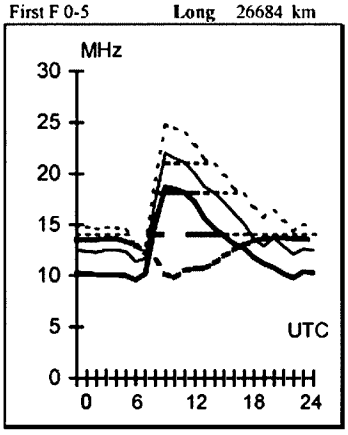
Hobart-Montevideo 161
Second 4F5-7 4E0 Short 11044 km



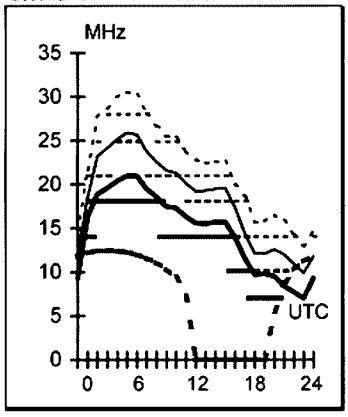
Melbourne-Nairobi 258
Second 4F3-7 4E0 Short 11501 km



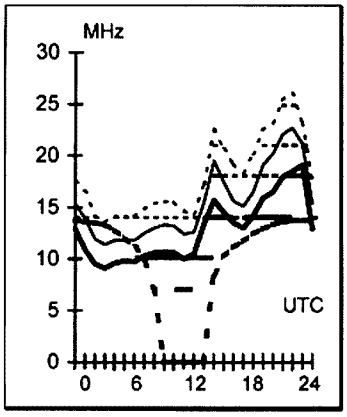
Perth-Rome 123
First F 0-5 Long 26684 km



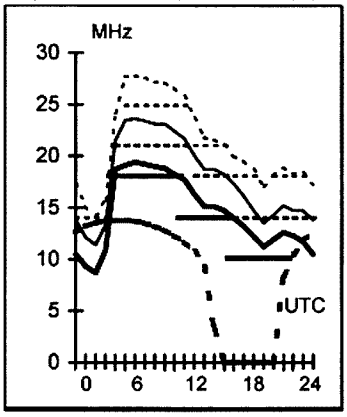
Sydney-New Delhi 302
Second 4F4-9 4E0 Short 10418 km



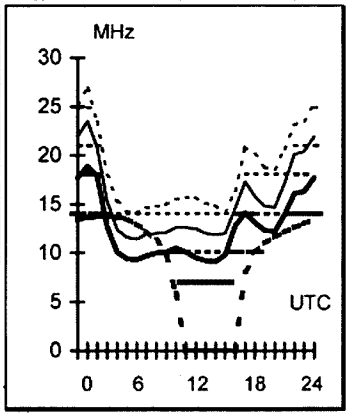
Hobart-New York 80
First F 0-5 Short 16609 km



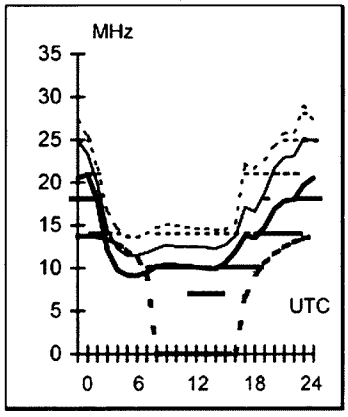
Melbourne-Tel Aviv 287
First F 0-5 Short 13766 km



Perth-San Francisco 66
First F 0-5 Short 14743 km



Sydney-Seattle 47
First F 0-5 Short 12470 km



Hamads *classifieds* FREE

FOR SALE VIC

•**SGC ADSP** 2 speaker deluxe, as new in box with all fittings $150. VK3GMM Phone 03 5985 2671.

•**MFJ UHF ant tuner SWR power meter MFJ-924** 300W max $75. Pieter VK3BK Phone 03 9879 1896

•**HB-35C Coman HF tribander** $200. **Prop pitch motor** + assorted synchros & indicators $150. Buyer collect. Jeff VK3AKL QTHR, Phone 03 5346 1147

WANTED VIC

•**Circuit 5" colour TV AWA model C-1502** UHF VHF or similar. Pieter VK3BK Phone 03 9879 1896

•**Circuit & handbooks for the following AM marine tranceivers.** Small ships radio, model no.KB4. Vaughan Viking model no. VR 15A. Crammond Commodore model no. 55A. Anthony VK3JIA, Phone 03 9728 4305, email vk3jia@tpg.com.au.

•**For a Wireless Set No 11** - one LP PSU box in any condition, plugs to suit this box would be appreciated. **Up to four 12SG7 valves** in good condition for my ARR-15 receiver project. **Slugs for R-1155 Rx front end,** in coils or not. Clem VK3CYD Phone 03 5126 2064 clem@dcsi.net.au

•**Yaesu FT-225R/RD 2m** all mode with digital display in GWO and GC. Or a junker with a working digital board. Damien VK3RX Phone 03 5427 3121 email: vk3rx@amsat.org

WANTED QLD

•**Kenwood TR-8400 70 cm FM transceiver mike.** VK4XT QTHR, Phone 07 4662 2389.

•**Australian official Radio Service Manual Volume 13, Year 1953.** Will pay all costs and postage. Frederick (Eric) VK4ZAJ QTHR, Phone 07 3359 9424.

•**WANTED DEAD or ALIVE FT-200** with/without power supply, reasonable price! Stuart VK4KKQ Phone 07 4972 9871 or email vk4kkq@hotmail.com

FOR SALE SA

•**Three inch square steel tubing pole tilt over and crank up 30 to 45 feet,** concrete base and guys. Three element tri band beam rotator and cables. Dismantled ready to move, $350 ono VK5ZB Phone 08 8276 1053.

FOR SALE WA

•**Radio receiver – Sony all band.** 100V. $80. **Field Strength and SWR meter Micronta** $15. **UHF Watt meter** (from kit) $15. **Commando VHF Transceiver** (Dick Smith - kit) $80. **Direct conversion receiver** (from kit) 80 metres $15. **QRP transmitter** (from kit) 80 metres CW $15. Bill VK6LT, QTHR Phone 08 94571080 email billLFT@telstra.com

WANTED WA

•**Power cable for Yaesu FT101B.** Happy to meet any costs. VK2MKZ@westnet.com.au, Phone 08 9168 3208 (after 1630hrs), P.O. Box 1094, Kununurra WA 6743, VK6NGD QTHR.

THE WIA QSL COLLECTION REQUIRES QSLS

All types welcome, especially rare DX pictorial cards, special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose Vic 3765, tel. (03) 9728 5350

About hamads....

- Hamads may be submitted by email (preferred) or on the form on the reverse of your current Amateur Radio address flysheet. Please print carefully and clearly, use upper AND lower case.
- Separate forms for For Sale and Wanted items. Please include name, address STD telephone number and WIA membership number if you do not use the flysheet.
- Deceased estates Hamads will be published in full, even if the ad is not fully radio equipment.
- WIA policy recommends that the serial number of all equipment for sale should be included.
- QTHR means the address is correct in the current WIA Call Book.
- Ordinary Hamads from those 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.
- Commercial advertising (Trade Hamads) are prepayable at $25.00 for four lines (twenty words), plus $2.25 per line (or part thereof), Forty word maximum, minimum charge of $25.00. Cheques are to be made out to: WIA Hamads.
- Copy typed or printed clearly please, and received by the deadlines shown on page 1 of each issue of Amateur Radio.

Email: *newunltd@bigpond.net.au*

Postal: *Newsletters Unlimited, PO Box 431, Monbulk Vic 3793.* **Fax:** *03 9756 7031*

TRADE PRACTICES ACT
It is impossible for us to ensure that 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 strictly complied with.

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 box-holder or seller of the goods.

Are you managing the estate of a 'Silent key'?

Please save any QSLs for the National QSL collection, but first contact:

The Hon. Curator,
Ken Matchett VK3TL
on (03) 9728 5350
or email: jeandawson@iinet.net.au

Rare DX, special call-signs prefixes and suffixes, pictorials and pre-war QSLs are needed.

Let us save something for the history of amateur radio.

ADVERTISERS INDEX

AEI 43
Andrews 17
Bansiac ..... IFC
Clarke 10
Com-an-tena 9
TET-Emtron 23
G & C 8
Icom ..... OBC
Masta tek 34
Ozgear 16
Rippletech 55
TTS 29
Small ads 55
VK Discounts 28
KVK Books 33
Winlink 47
www.vk3ajj.com 55

Rippletech Electronics

New to radio or perhaps need a new challenge? Want to earn the WIA's new 5BDXCC award? With a Nally tower, an 80m sloper and a 40m rotary dipole you can get low band DXCC, even from your city lot! Want DXCC on the WARC bands? The WARC band dipole on placed above your traditional tribander will get you there.

Like to travel with your new micro radio? Grab a TZ-V-3 which packs down to only 1m long, fits in the boot or on a plane & assembles in minutes. Outperforms lossy super wideband designs.

TZ-1840	1:1 1kW 160-10m Balun (1.8- 40 MHz)	$ 59.00
TZ-330-4	4:1 1 kW HF Balun (3 - 30 MHz)	$ 59.00
TZ-SL8	80m Sloper (use tuner for 17 & 30m)	$ 99.00
TZ-SL16	160m Sloper (fits in a suburban lot!)	$ 110.00
TZ-D-4080	40m/80m Trapped Wire Dipole	$ 176.00
TZ-V-3	10/15/20m Trapped Vertical	$ 189.00
TZ-V-4	10/15/20/40m Trapped Vertical	$ 289.00
TZ-RD-3	10/15/20m Trapped Rotary Dipole	$ 199.00
	Vertical Radial kits (1 rad. per band)	$ 33.00
TZ-V-3w	12/17/30m Trapped Vertical	$ 279.00
TZ-RD-3w	12/17/30m Trapped Rotary Dipole	$ 289.00
TZ-RD-40	17/40m or 20/40m Rotary Dipole	$ 279.00
TZ-1000RC	FT-1000mp remote controller acc	$ 33.00
	5th Order HPF TVI Filter (coming)	$ 39.00
	Mobile whip base & Z bracket combo	$ 11.00

Our trapped antennas use high Q, high isolation coaxial traps which are fully sealed and exhibit 40 dB of isolation at the resonance.

Need something special?
Give me a call and we'll see if we can meet your needs.

www.rippletech.com.au

Contact Tony – VK3TZ
0402 622 562 or email
sales@rippletech.com.au

Mastercard, Visa and Bankcard accepted

AMIDON FERROMAGNETIC CORES

For all RF/electronic applications.

See our website for complete data on all cores including prices.

www.catchnet.com.au/~rjandusimports

RJ & US Imports
PO Box 431, Kiama NSW 2533.
A 3.5" PC disk containing all data is available for $5.00 incl. post.

Agencies
Active Electronics, Tas
TTS Systems, Tyabb (VIC)
Tower Communications, Perth
Ozhelp Services, Brisbane

HF, VHF, UHF ANTENNAS & ACCESSORIES

Aluminium towers, guys etc

Diamond VSWR/PWR meters.

HD copper antenna wire & insulators, TX tubes & pwr transistors, full range Create Rotators

Quality coax cables & connectors. Free advice & catalogue.

ATN Antennas

Ph 03 5492 2224 Fax 03 5492 2666,

email atnant@iinet.net.au
PO Box 80, Birchip Vic 3483

"Hey, Old Timer..."

If you have been licensed for more than 25 years you are invited to join the

Radio Amateurs Old Timers Club Australia

or if you have been licensed for **less than 25 but more than ten years**, you are invited to become an **Associate Member** of the RAOTC.

In either case a **$5.00** joining fee plus **$8.00** for one year or **$15.00** for two years gets you two interesting OTN Journals a year plus good fellowship.

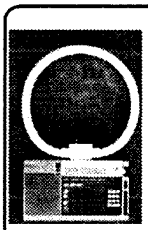
Write to
RAOTC,
PO Box 107
Mentone VIC 3194
or call Arthur VK3VQ on **03 9598 4262** or Bill VK3BR on **03 9584 9512,**
or email to raotc@raotc.org.au
for an application form.

JACKSON BROS

JACKSON OF THE UK IS BACK

Highest quality products made by UK craftsmen
www.jacksonbrothers.com.au
Full range now off-the-shelf in Australia.
Variable and trimmer capacitors, reduction drives, dials, ceramic standoffs
CATALOGUES, PRICE USTS AVAILABLE

CHARLES I COOKSON PTY LTD
11-13 Port Rd
Queenstown SA 5014
Tel: (08) 8240 3200 Fax: (08) 8240 3233
FreeFax 1800 673355 within Australia
Email: sales@jacksonbrothers.com.au
ALL MAJOR CREDIT CARDS ACCEPTED
SOLE AGENTS AUSTRALIA AND NEW ZEALAND



Tunable Loop Antenna enhances AM Reception

AM radio reception (530 to 1900KHz) enhanced. Reception where none existed before; works indoors, even in interference-polluted areas
High value — low cost.
Simple, no connections or batteries
Ideal for touring, caravan, boat and fringe areas. Use anywhere.

www.amradioantennas.com
pkloops@bigpond.net.au
Paul 0412 302 939

PK's Loop Antennas

RADIOS:

	Unused	*Used*
Icom 706MK2G	Ring/email	$1199
Icom 208H	$ 550	$ 499
Icom 910H	$2299	$1799
Icom 756PRO2	N/A	$2799
Icom 756PRO3	$4399	N/A
Kenwood TS2000	$2699	$2299
Kenwood TS2000X	N/A	$2999
Kenwood TS480SAT	$1699	$1499
Kenwood TS480HX	$1999	$1699
Kenwood TS570DG	N/A	$1349
Kenwood TMD700A	$ 849	$ 799
Kenwood THD7A	$ 599	$ 549
Yaesu FT8900R	$ 649	N/A
Yaesu VX7R	$ 549	N/A
Yaesu FT1000MP MKV	$3599	$3199
Yaesu FT1000 Field	$3199	$2799
Yaesu FT847	N/A	$1799
Yaesu FT857D	$1249	$1149
Yaesu FT897D	$1299	N/A
Yaesu FT100D	N/A	$1099

ACCESSORIES:

Doss 40 AMP PSU	$ 235	N/A
Icom AH4 ATU	$ 525	$ 465
Icom AT180	N/A	$ 549
Tokyo HL700B HF Amp	$1899	
Tokyo HL200V50 2M Amp	$ 549	
MFJ 993 ATU	$449	

Call / email re Heil and MFJ products

DOA warranty applicable on all items (ie if it is not 100% and in condx as described, a full money back g'tee applies)

OTHER CURRENT MODELS AVAILABLE

ALL USED GEAR IN EXC CONDX WITH ORIGINAL BOX AND ACCESSORIES

PRICES SUBJECT TO CHANGE - CHECK WEBSITE FOR LATEST (OR RING)

WILL CONSIDER TRADE-INS - BUT MUST BE CURRENT MODEL GEAR (IE LAST 5 YEARS)

Ship anywhere in VK/ZL (freight extra)

ORDER ONLINE AT

WWW.VK3AJJ.COM

OR TELEPHONE PAUL ~
(03) 9018 9757
Mob. 0410 093 759
vk3ajj@iinet.net.au

NB - I am not an authorised dealer for the radio companies listed above. These companies may refuse service on equipment sold by me - but other servicing options are available in the VK market.

Licensed Second Hand Dealer NO 10229 (Vic)

WWW.VK3AJJ.COM - giving Aussie Hams a FAIR GO!

Directory

The Amateur Service:

a radio communications service for the purpose of self training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique with a personal aim and without any pecuniary interest. 1.56 ITU Radio Regulations.

The Wireless Institute of Australia represents the interests of all amateurs throughout Australia.

WIA membership fees are: **★ $ 75 for full members (F grade), ★ $ 70 for pensioners and students (G and S grade), and ★ $ 50 for membership without 'Amateur Radio' (X grade).** ***Payment direct to National office.***

National Office	Contact	News Bulletin Schedule
10/229 Balaclava Road, Caulfield North VIC 3161, PO Box 2175 Caulfield Junction Vic 3161 Australia	Phone 03 9528 5962, Fax 03 9523 8191, 10am to 4pm daily, nationaloffice@wia.org.au http://www.wia.org.au	Subject to change see www.wia.org.au follow national news prompts. Contact nationalnews@wia.org.au National VK1WIA news is distributed to all states.

Advisory Committees	Contact	News Bulletin Schedule
VK1 Australian Capital Territory VK1WX Alan Hawes VK1ZPL Phil Longworth VK1ET John Woolner VK1GH Gil Hughes	secretary@vk1.wia.ampr.org	Sundays at 11.00 am VK1WIA 7.128, 146.950,438.050 Canberra Region Amateur Radio Club Email newsletter will be sent on request to president@vk1.ampr.org
VK2 New South Wales VK2QV Chris Flak VK2XCD Chris Devery VK2BFN Adrian Clout	Phone 02 9689 2417	VK2WI - Sunday 1000 and 1930 hours local.1.845; 3.595; 7.146; 10.125; 14.170; 28.320, 52.525; 145.600; 147.000; 438.525; 1273.500 megahertz. Plus regional relays. VK1WIA news included in the morning
VK3 Victoria VK3JJB John Brown VK3PC Jim Linton VK3APO Peter Mill	Phone 03 9885 9261 advisory@wiavic.org.au	VK1WIA Sunday 11.0am via HF and major VHF / UHF rptrs
VK4 Queensland VK4ERM Ewan McLeod VK4ZZ Gavin Reibelt	Phone 07 3221 9377 ewan.mcleod@bigpond.com	VK1WIA, Sunday 9.0am via HF and major VHF/UHF rptrs
VK5 South Australia and Northern Territory VK5NB Jim McLachlan VK5APR Peter Relchelt VK5ATQ Trevor Quick	Phone 08 8294 2992 jimac@picknowl.com.au peter.relchelt@bigpond.com vk5atq@chariot.net.au	VK5WI: 1843 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.800 FM Mildura, 146.900 FM South East, 146.925 FM Central North, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 LSB, 7.065 LSB, 10.125 USB, 146.700 FM, 0900 hrs Sunday. The repeat of the broadcast occurs Monday Nights at 1930hrs on 3585kHz and 146.675 MHz FM. The broadcast is available in 'Realaudio' format from the website at www.sant.wia.org.au Broadcast Page area.
VK6 Western Australia VK6NE Neil Penfold VK6XV Roy Watkins VK6QO Bruce Hedland-Thomas	Phone 08 9351 8873 http://www.vk6.net/ advisory@vk6.net vk6ne@upnaway.com vk6xv@bigpond.net.au	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.865, 3.564, 7.075, 10.125, 14.116, 14.175, 21.185, 29.120 FM, 50.150 and 438.525 MHz, Country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton, 146.900 (R) Mt William (Bunbury).147.000 (R) Katanning and 147.250 (R) Mt Saddleback. Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.564 and 438.525 MHz : country relays on 146.900,147.000, 147.200, 147.250 and 147.350 MHz..Also in "Real Audio" format from the VK6 WIA website
VK7 Tasmania VK7ZAX Phil Corby VK7DG Dale Barnes VK7KK Reg Emmett	Phone 03 6234 3553 phil.corby@tassie.net.au vk7dg@wia.org.au regemm@ozemail.com.au	VK1WIA Sunday 9am on VK7WI network: 3.570MHz LSB, 146.700 MHz FM (VK7RHT South), 53.825MHZ FM (VK7RAD South), 147.000MHz FM (VK7RAA North), 146.750 FM & 53.825MHz (VK7RNW North West), 146.625 MHz FM (VK7RMD North West), UHF CB Channel 15 (Hobart) and 27MHz CB - 27.225MHz LSB (Hobart). Followed at 9:30am with VK7 Regional News Broadcast also on 7.090MHz LSB & 14.130MHz USB

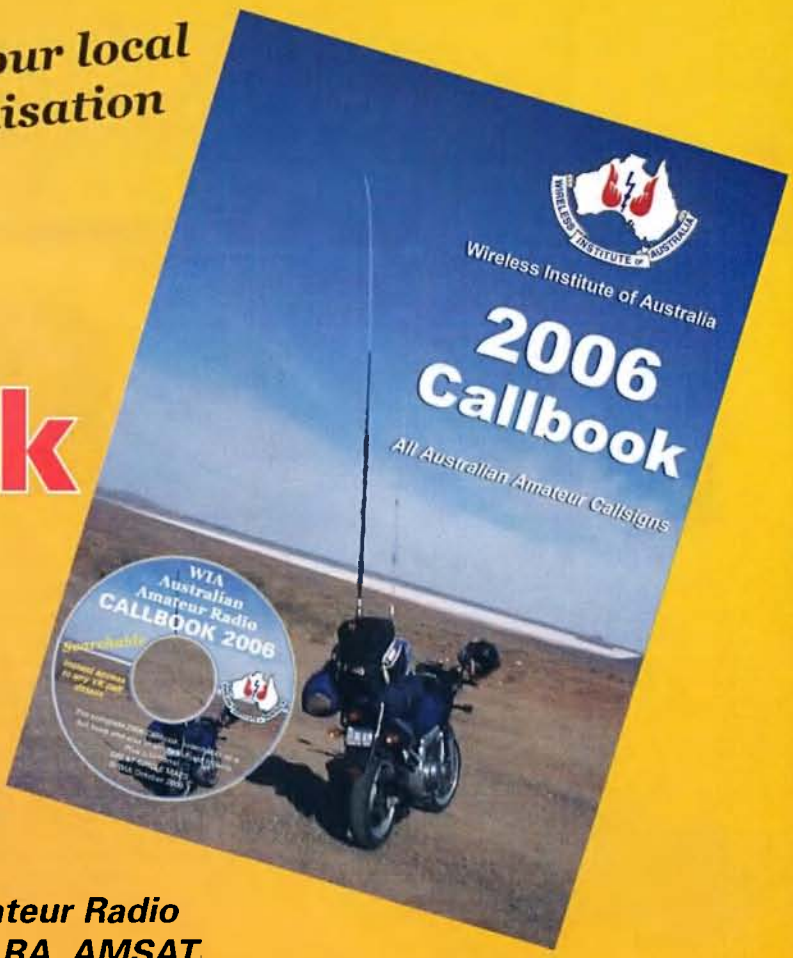
Notes

1. Only three members of the state advisory committees are listed.
2. All listings are preliminary. They will be updated each month as required.
3. Membership application forms are available from the WIA web site www.wia.org.au or the national office address above.

Now available from your local Amateur Radio Organisation

2006 Callbook

All Australian Callsigns



Plus great detail about:

The new WIA, Amateur Radio Clubs, WICEN, ALARA, AMSAT, ARDF, Band Plans, Beacons, the ACMA, Examinations, QSLs, Great Circles, Maidenhead, DXCC, Packet Radio, Repeaters and more.

How to get your copy:

Contact your local Amateur Radio Club or WIA National Office

03 9528 5962 nationaloffice@wia.org.au

Prices from National Office

	Pick up	Posted
WIA member	$22	$25
non-member	$30	$33

ICOM'S PRICE BREAK THROUGH

MOST AFFORDABLE PRICES EVER

ICOM FLAGSHIP TRANSCEIVER

IC-7800 HF*6m

• Four 32-bit floating point DSP units • +40dBm ultra high intercept point • Automatic tracking pre-selector • Two completely independent receiver circuits • 200W output power at full duty • Ultra high frequency stability • 7-inch wide color TFT LCD • Multi function spectrum scope • RTTY / PSK31 operation without PC connection • Professional 6m receiver • Digital Voice Recorder • CF memory card

NEW

IC-756PRO III HF*6m

Sharp & soft IF filter shape • New receiver gives +30dBm third-order intercept point • One-touch record/play Digital voice memory • Extended 1/4 Tuning step & BPF functions for SSB-D mode • 32-bit floating-point DSP and 24-bit AD/DA converter • SSB/CW sychronous tuning • 5-inch color TFT LCD • Built-in antenna tuner • Customisable filter shap • No optional filters to buy

IC-706MKIIG

The amazing evolution of the legendary 706

Now includes 70cm @ 20W and 50W on 2m Standard feature dsp • Built in sub tone encoder & decoder Tone scan • Mosfet PA • You get base station performance and features in a mobile rig sized package

NEW

IC-2200H

High (65W) Power Output • DTCS & CTCSS Tone Squelch • DTMF Encode & Decode (with optional UT108) • Digital Voice & Data Communication (with optional UT118 • 207 Alphanumeric Memories

IC-208H FM Dual Band Transceiver

Dual Band Features at a Single Band Price • 55W / 2m, 50W / 70cm • Built-in CTCSS and DTCS Tone Squelch • Detachable Front Panel standard (Req. OPC-600/601 Option) • 9600 bps Packet Operation • 512 Memory Channel • Standard Mic. Supplied: HM133.

NEW

IC-T90A A new 5W Triband handheld

VHF/UHF FM 2M, 6M, & 70CM Wideband receive 495 KHz - 1 GHz 555 Alphanumeric memories • 13 Scan modes DTCS & CTCSS encode & decode DTMF encoder (10 memories) Wide/narrow transmit capability.

IC-V82 7w VHF Handheld

207 Alphanumeric memories • DTCS & CTCSS Tone Squelch • DTMF encoder • Digital voice and data communication (Req. UT114 option) • GPS receiver can be connected • BNC type antenna connector

AIRBAND **AMATEUR** LAND MOBILE MARINE RECEIVER UHF CB

ICOM

ICOM 48

Call you local ICOM dealer

www.icom.net.au or (03) 9549 7500